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Editorial

Intelligentsia reflects on education worldwide, analyses the present scenario and tries to foresee the demands in the future, India being no exception. The present appears very promising when we look on to the demographic dividend, the Indian students doing well internationally and the famous personalities of the globe e.g. President of USA advise their youth to gear up to compete with Indian students. It appears not so bright when some reports of learning achievements of students show unacceptable results or when a large number of teachers fail to clear the Teacher Proficiency Tests. The researchers, thinkers and planners keep a watch on realities and come out with innovative ideas to meet the educational goals. In the present issue of Indian Educational Review, we bring to you some more outcomes of research activities, which may eventually play their part in improving the achievements.

The researchers in their contribution have reflected upon a variety of issues of contemporary concern and interest. The present issue contains four research papers, one innovation, two research notes, summaries of two research projects and two book reviews. First paper of the issue deals with exploration of life-skills through researcher generated cartoons which tries to explore the possibility of using cartoons as a tool to understand the life-skills of pre-adolescents. Second paper of the issue deals with the challenges and issues of teaching environmental studies at primary stage and attempts to help in formulating simple strategies to convert challenges into opportunities. Third paper is a study on the educational change and teachers' pedagogical content knowledge (PCK) – integration for professional development carried out with a sample of in-service teachers which deals with the teachers' understanding about educational change and their ability to deal with the change. And the fourth paper is a case study of Kerala which focuses on the influence of gender, management and locality of schools on the thinking styles of secondary school students. This time we have also included one research innovation in the issue which is a report of an experiment to enhance understanding in mathematics. We have also included two brief research notes in this issue which aim to explore some additional dimensions. The first one is a study of multi-grade teaching on the achievement levels in Hindi and mathematics of second standard in government and NGOs schools. Second note reflects the importance of field experience and its practice in education as an individualised, experiential learning opportunity.

Summaries of two research projects funded by NCERT under ERIC are included. These are:

1. Experience and Consequences of Happiness: A Study of Happiness among School Students and Teachers
2. A Study of the On-going Processes of Pre-service Elementary Teacher Education Programme in Maharashtra

The issue also contains two book reviews which are relevant in the contemporary area of education. These are:

1. PPP Paradox: Promise and Perils of Public-Private Partnership in Education
2. Action Research in Education: Learning Through Practitioner Enquiry

The Indian Educational Review focuses on enriching the discipline of education by disseminating findings of educational research, providing opportunities for exchanging research experience among fellow researchers, motivating young researchers and providing inputs to all those involved in policy making and planning. Contributions of academicians, researchers, research writers and institutions are cordially invited for the next issue. We welcome your suggestions for bringing any improvement in the quality of journal.

POONAM AGRAWAL
Academic Editor

Indian Educational Review

Indian Educational Review aims to enhance the theory and practice of research in education. It is a journal of opinion and research in the field of education. Contributions may comprise scholarly discussion of new issues, reports of research, reviews of researches in particular field, reports of developments, and debate on educational research generally or on specific issues. Contributions are also invited reporting all kinds of empirical research in education, whether sociological, psychological, economic or organisational. The journal is intended to cover a wide range, including interdisciplinary studies.

In addition, the purpose of this journal is to provide a medium for dissemination of educational research and exchange of experiences among research workers, scholars, teacher educators, teachers and others interested in educational research and related fields and professions.

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OFFICES OF THE PUBLICATION DIVISION, NCERT

NCERT Campus
Sri Aurobindo Marg
New Delhi 110 016 **Phone: 011-26562708**

108, 100 Feet Road
Hosdakere Halli Extension
Banashankari III Stage
Bengaluru 560 085 **Phone: 080-26725740**

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Maligaon
Guwahati 781 021 **Phone: 0361-2674869**

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Announcement

Some of the forthcoming issues of IER will be special issues dedicated to specific themes. Two of these are planned to be on 'Inclusive Education' and 'Quality of School Education' including enhancement assessment.

Research Papers

Exploration of Life Skills through Researcher Generated Cartoons

TEENA AUGUSTINE* AND MILIND BRAHME**

ABSTRACT

Visual methods are a marginalised area in the field of research methods in education. The use of cartoons within this field is even more negligible. The use of photo elicitation and audio-visual techniques often takes precedence over techniques such as cartoons. As compared to interactive audio-visual software and animation, the use of 2D images is a challenge for researchers working among primary school children. This paper deals with the possibility of using cartoons as a tool to understand the life skills of preadolescents. It discusses methodological issues that arise while using visual methods in dealing with sensitive issues, especially with such young respondents.

This paper also discusses how researcher-generated cartoons were created and the problems encountered in administering, seeking permission from authorities and ethical issues related to the use of cartoons. It highlights the usefulness of such methods in educational research, when carried out taking the cultural values and beliefs of the setting into consideration.

Key words: *Cartoons; Visual methods in education; Life skills*

Visual Methods in Research with Children

When we write or picture the social world we reformulate it.

— KNOWLES and SWEETMAN

Researching children's experiences is challenging, particularly so in primary schools when the research question deals with personal problems of the child. To begin with, the mainstream schooling

* *Research Scholar*, IIT Madras
** *Associate Professor*, IIT Madras

process in India is so obsessed with academic achievement that it could be daunting to explain to teachers and school administrators the very purpose of a research of such nature that does not study academic accomplishment. There is a good chance that they might dismiss any study that does not deal with academic achievement as unnecessary. However, for a researcher interested in the child as a person, it is of great importance to understand the lived experiences of children and how children interpret and negotiate their daily life. This would require the use of methods that can capture the nature of children's lives as lived rather than those that rely on taking children out of their everyday lives into a professional's office or 'lab'(Greene and Hill, 2005, pg. 4). This study attempts to understand the concept of lifeskills through primary school children's experiences. An investigation of this nature necessitates an understanding how a child thinks and feels in a crisis in daily life. Since the nature of the problem is sensitive and deals with domains outside school life, it requires methods beyond naturalistic observation to elicit responses. Hence visual methods were selected for this study. According to researchers (Allen, 2009; Pink, 2001) who use visual methods for young people — Visual methods prioritise the voices of the young and hence have the potential to challenge existing approaches by giving young people the opportunity to narrate their stories in their own voice. In this aspect visual methods stand in contrast to adult—designed methods like interviews which rely exclusively on written text. The pilot studies undertaken in this study to explore children's experiences revealed to the researcher that many school children found questionnaires and interviews uncomfortable, which confirmed what the aforementioned researches suggested and in turn led to the selection of visual methods to explore the experiences of the child.

This paper critically examines the effectiveness of cartoons as a visual method in eliciting responses from children regarding their life experiences and in turn so as to enable a researcher to study their life skills. In doing so, it attempts to answer the following questions: What is image based research and how effective are cartoons as a visual method? How do cartoons get generated and how are they used to elicit responses from children? Though the research topic of this study is life skills of young children this paper focuses solely on the methods adopted to understand this concept and hence the method of creating cartoons will be discussed prominently in this paper.

Cartoons – A Visual Method for Children

Image based research includes found, researcher-generated or participant-produced video, photographs, drawings, cartoons, maps and other visual forms of expression and representation. Over the years, the use of images has been accepted as a valid method of data gathering, and is simultaneously considered as a part of alternative approaches to representing research results, because it offers a different form through which researchers and participants can express their experiences and present themselves to others (Chaplin, 2004; Prosser, 1998; Rose, 2001).

While discussing interviews using images and texts vis-à-vis interviews using texts alone, Harper emphasises the fact that images evoke deeper elements of human consciousness, which is perhaps a strong reason for the increasing use of photo elicitation techniques in sociological and anthropological research.

Within the domain of image research, the use of photography has been debated with regard to subjectivity and unscientificity almost from the very beginning of the disciplines of anthropology and sociology (Becker, 2004). Some researchers believed that photographs could not capture the essence of a routine (Goffman, 1979). This very notion was challenged by researchers like Chaplin who used photo diaries to authenticate the use of photographs to capture the reality of routine life. Chaplin notes that very soon she felt that the photographs by themselves were incomplete and required short descriptions. Quoting Burgin (1986) she states, "Photographs do not speak for themselves, and at a basic contextual level it is words which give meaning to images" (qtd. in Chaplin 36). The realisation that knowledge of the cultural context was necessary to adequately interpret pictures has made it almost imperative that visual images are accompanied by explanatory statements.

In this context this paper explores the potential of cartoons as a visual method within the discipline of education. Appealing to both children and adults alike, cartoons are a medium that uses visual and textual material to reformulate the social world. Harper (2002) further states, "Most elicitation studies use photographs, but there is no reason studies cannot be done with paintings, cartoons, public displays such as graffiti or advertising billboards or virtually any visual image"(Harper, 1) highlighting the significance of cartoons as a tool in eliciting responses. For various reasons though, perhaps due to the difficulty in designing, producing or collecting cartoons, they have remained neglected in educational, sociological and anthropological research.

As compared to photo elicitation techniques, where one uses a device to capture an image, researches with cartoons as a tool seem difficult because cartoons pertaining to the topic of study are not easy to collect from magazines and newspapers. Moreover, generating cartoons requires producing an image using creativity and skill—drawing skills as well as skills to build narratives – alongside a thorough understanding of concepts and contexts.

The next concern – similar to the debates over researcher-generated and subject-generated photographs – is researcher-generated versus participant-produced cartoons. The image and text that arise out of the interaction between the researcher and the participant are received by the participants very differently when compared to those that the researcher alone presents. The context recognition by the participant in the case of the former enhances the potential of cartoons manifold in the field of education, especially when the research questions are difficult to be extracted and understood in terms of words alone. However, we need to distinguish between the use of researcher-generated cartoons and that of child generated artifacts and drawings or photographs. The following can be used as markers for the same.

1. The control rests in the hands of the researcher. A cartoon cannot be interpreted effectively without dialogues and great care needs to be taken not to appropriate the child's narrative by using adult language. An incident from the child's life translated by the researcher into a cartoon has elements expressed by the researcher from his or her understanding of the event narrated by the child. The researcher must always be aware of the thin barrier that might differentiate his or her perception of the event from that of the child.
2. Articulating a child's narrative in the form of a drawing by an adult requires a great amount of imagination, empathy and understanding. The onus in this process is on the researcher. It often entails the researcher constantly questioning his/her perceptions of what is trivial and significant in a particular scene in a cartoon. What attracts the child and an adult in the same cartoon could be widely different. There are situations where the child responds to the picture while completely ignoring the dialogues, which the researcher as an adult might find hard to accept.

Despite the differences between researcher-generated cartoons and those produced by participants, its legitimacy as a method in

research cannot be denied. The advent of 'concept cartoons' in the late 90's elucidates the acceptance that researcher-generated cartoons have received in the field of education. This approach advocated the use of cartoons so children would understand concepts in science and math, breaking the monotonous chalk and talk method to explain concepts. The possibility of presenting concepts in a poster format with pictures and dialogues for better understanding was the main thrust of this idea. Concept cartoons were viewed as one of the possible strategies for promoting argumentation (Feasey, 1998; Keogh and Naylor, 1999; Naylor, Downing and Keogh, 2001; Osborne, Erduran and Simon, 2004; Wellington and Osborne, 2001). They have since been used widely in science and math education and are believed to be an effective tool to supplement teaching methods.

Nevertheless, researches engaging with cartoons have limited themselves to improving learning and teaching. This paper attempts to illustrate the use of this tool to explore the life skills children employ in their day to day life while facing challenges in their personal and social setting. The paper thus draws attention to the possibility of using cartoons to study qualitative aspects of education.

The Study

This paper is part of an ethnographic study in four classes (two sections of 4th and 5th STD) in a primary school in the city of Chennai, catering to poor students. The school- KMHS was an unaided school and had children from three slums surrounding the school. The participants aged 8 and 9 years. The study had three objectives:

i. To explore and understand the issues and problems pre-adolescents face in their day-to-day personal, social, and academic life.

ii. To understand how life skills evolve through the challenges pre-adolescents face and the strategies they employ in their day-to-day life to cope with these challenges.

iii. To understand the factors that contributes to the enhancement of life skills development in personal, social, and academic life of pre-adolescents and to analyse the interplay between these components.

Cartoons as a visual method explored the first and second objective of this study and explored the problems of pre-adolescents (children below the age of 13).

Methodology and Setting

The research methodology of this study was informed by the ecological approach of Bronfrenbrenner and naturalistic observations. By adopting this approach, the researcher acknowledges firstly that children are embedded within social and cultural contexts and that the relationship between child and context is transactional; secondly, a great deal can be learnt about children's lives by following and observing them within these contexts (Tudge and Hogan, 2005)

This study sought to understand the daily experiences of the child using naturalistic observations. But from interactions with children during preliminary phases of the study it was soon understood that their life experiences stretched beyond school and it was not possible to observe them at their homes due to difficulty in gaining access to homes. Children came from backgrounds which were volatile with disruptive families and some single parent households. The issues of alcoholism and domestic violence were rampant in most families. Though it was difficult to observe the impact of these problems upon the children, it was evident from the conversations with them that these incidents influenced their lives greatly. The community they came from was sensitive and not easy to enter. Mostly parents worked from early morning to late evening making it difficult for the researcher to meet them.

As a result, through classroom observation and observations inside school provided an understanding of how children coped with, negotiated and interpreted daily experiences within school, focused group discussion were carried out using cartoons to understand specific problems that cannot be gauged through observation, especially those problems pertaining to family.

The study also draws strength from the social constructivist theory and argues firmly for the child's ability to construct meaningful interpretations of his world, which the researcher accepts unconditionally. Hence, the cartoons were drawn on themes that recurred in general conversations and were later taken up for discussion. This made up for the observations that could not take place outside schools.

The focus in the initial days was to observe the day-to-day activities of children and to understand the problems they faced in their domestic and social life and in turn to understand the strategies employed by them to cope with the same . This led to the exploration of life skills in children in day to day stressful situations. The following definition of life skills, given by WHO, was adopted for this study.

Life skills have been defined by WHO (1993) as "the abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life" (pg. 2). The ten core life skills proposed by WHO are problem solving, decision making, critical thinking, creative thinking, interpersonal relationship skills, communication skills, self awareness, empathy, coping with stress and coping with emotions.

In many situations in life, one or more of these skills need to be exercised to meet the daily challenges of life. Manuals and programmes focusing on life skills deal with specific issues that need to be dealt with for healthy personality development. Programmes seldom focus on understanding the inherent life skills in children. Moreover, there are hardly any modules that guide one in understanding how the child works in the context of a problem and how he/she acquires life skills.

Studying a research problem of this nature requires a holistic understanding of the context and life of the child and problems that he/she faces in day to day life. This would also require faith in the child's ability to deal with issues he feels are genuinely detrimental to his life. Therefore, taking a social constructivist stance and believing firmly in the child's ability to identify issues pertinent to his/her life, exploring the strategies he needs to employ in those situations became the objective of this study.

This question was too vast and hence observations were carried out for one month in the suburban school and two months in an urban school. The observations were recorded and children from disturbed backgrounds were observed more closely than others to form case studies. It soon came to the notice of the researcher that the children with problems at home had a different style of coping with issues personal to them unlike the others in the group.

The propelling question of the research was to understand how life skills were acquired and how the child viewed these problems and the solutions to them. It was soon understood that not all problems led to a tendency towards high risk behavior. Many children found problems in life quite motivating and many had developed resilience as a result of these problems. This phenomenon has already been discussed in other studies. But the journey of the researcher to reach this understanding was strenuous as it was difficult to conduct conversations of personal nature without knowing which children faced problems at home. The difficulty of an outsider to penetrate into long hours of silence was the biggest obstacle in this phase

of the study. Due to this situation, snowball sampling was done. When one child who confided confidently struck a rapport with the researcher, similar children were met through her and the informal discussions continued. Observations and interactions with children soon helped the researcher cull out a few problems that revolved around the three spheres of their life - family, school and peers. The cartoons that were generated were a result of such interactions.

On Cartoons — from Generation to Reception

The cartoons were used as stimuli to initiate conversations in the focused group discussion on issues pertinent to the lives of children. The respondents were limited to 5 in each focused group discussion (FGD). Ten such FGD's were conducted. As some members of the groups expressed discomfort in sharing their views with respondents from opposite gender, the groups had members from the same gender. In some groups there were issues with power and control. Many top academic achievers who were used to giving right answers in classes went silent when they realised the questions asked could be answered by anyone, even a 'mediocre' child. This broke their sense of superiority and in many groups the top academic achievers are not very vocal. Despite all these barriers, the study engaged in conversations with children to understand the issues pertinent to their lives that showed how they employed life skills.

Children responded to 16 cartoons (insert table) in the focused group discussion. Naturalistic observation was the main tool of the study and the cartoons were meant to provide supplementary information beyond the scope of observation. In some ways, this method is an adaptation of photo elicitation method by Harper (2002). The need to open up real life situations that focus on sensitive issues, which cannot be captured using a camera, led to the researcher drawing these scenes in the form of cartoons. Great care was taken to ensure that these images were neutral and not value laden as their role was just to initiate conversations and not lead to biased arguments.

The ideal situation would have been if children themselves could draw cartoons and discuss the problems in their life. Many studies have expressed the efficacy of such an approach (Cox, 1999) wherein with facilitation from the researcher the children were able to draw graphics and write metaphorically the messages for the graphics. But as Cox describes in her study:

> To be effective, telling cartoon stories involves a great deal of abstraction and editing. Some of the tales had several versions, drawn and written, and they still failed to complete all the cohesive gaps for the reader. None of the children found the graphics too demanding, but creating an unambiguous narrative line was not easy. That exercise encourages more flexible thinking and cooperative working so that, provided all the youngsters participate, it is one way to stimulate an exchange of ideas and proper shifts of focus (Cox, 231).

These were points that resulted in the researcher stepping in to create cartoons. Firstly, the participants selected for focused group discussions on random sampling had children of different acumen and many did not enjoy drawing. Even when they did draw figures, they struggled with writing dialogues and with basic reading and writing skills.

Secondly, many children did not get along well in a group to carryout an activity which required a high level of metacognitive thinking and analysis.

Owing to the limited time available between classes to conduct focused group discussions, it was found justifiable that the researcher undertook the task of producing cartoons with care given to construct them out of narrated incidents from the lives of the children.

The cartoons were drawn using the tools from a website that helped in designing cartoons[1]. The sketches were designed to bear resemblance with the people from the school community. Six figures were created who were later sketched in different backgrounds. These figures had definite names but each situation was introduced as an individual one and not as a series. The table below explains the scenes of the cartoons and the skills the cartoons aimed to understand.

Focused Group Discussions with Cartoons

A typical group discussion began with self-introduction of children. Sometimes in these introductions children brought up topics about family, school and the ensuing discussion helped strike a rapport within the group. The cartoons were introduced thereafter but in no particular order. These cartoons led to discussions on the issues portrayed in them and how the children faced the day-to-day situations depicted in the cartoons. At the same time, these sessions provided remarkable insight in terms of the efficacy of cartoons as

a tool in order to understand the day to day problems that children face and the strategies they employ to cope with the same.

Few points that came up were related to the commonality of characters throughout the cartoons, peculiarity of props in scenes, dresses worn by characters, resemblance of features to children at school. These points are further explained below with images as well as excerpts from the discussions.

It was often noticed that children were able to link the characters in different scenes and weave a story combining the sixteen cartoons under discussion. The cartoons had six characters in common but each scene was different and unrelated. However, the characters were given the same names for convenience and very soon this led the children to believe these cartoons were stories of Mala and Raghu who, like them, faced difficult situations in life. A few comments that are quoted below revealed how children were engrossed in the process of reading the cartoons.

> Gautam: Poor girl already her father has left her mother and her and she has enough problems and now these men are torturing her on the street.
>
> Balaji: Life is like that at times, bad things keep happening to the same person.

The above conversation took place after the discussions on two cartoons (one depicts Mala being asked to stay with her grandmother due to financial crisis and the other is a situation where Mala has to choose between her mother and her father who has remarried). While the use of the name and character Mala repeatedly was unintentional, the background, other family members were all different in both scenes. Yet children empathised so well with Mala that they did not care much about the other characters, nature of problem or even the fact that the fathers in both the cartoon were different individuals. This was interesting also because many children in the group had parents who had remarried and spent considerable time in two households. They hence neglected the characters depicted in the background like father, mother or siblings these terms were plural in their life as many said they had two fathers. What struck to them was only the central character


This is my family
i can't manage the expenses send her to your mother
But there are no good schools like she went here
Your brothers go to english medium does not mean you should go there too.
But why am I left here with patti and why should I go to govt school?
Madam, Please dont send Mala with her father
Why what happened?
He left us and married someone else now he is in a police case too !
I cant deny another parent the right to meet his child
What will you do if appa comes. Who do you want to go to?
Mala! I have come to take you home
What will I do?

who like them was a silent victim. Both cartoons were designed as individual episodes but children linked them.

The children often took the cartoons from the researcher and glanced at them/studied them before they began the discussion. Many children often segregated the cartoons based on the characters. The familiarity with the characters made them really empathise and answer more reflectively.

Augustine: Hey the same girl again

Satish: Her father must have brought a new headache

Ganesh: Is this a storybook, see the same girl here, here and here (taking out previous cards) and the same father here and here (pointing at the two cards), you should have made this a book.

Here again the children were trying to make sense of the cards by trying to establish connections between them rather than read each card as an individual situation. This slowly turned into a pattern and the researcher continued with the same to make it more comfortable for the group, as it was understood that children, like adults need a narrative thread to make sense of their daily life.

In this cartoon when the child uses statements like "same girl again" and "father must have brought a new head ache", they are trying to establish a connection between the cartoon discussed earlier where the father had left the daughter and mother to remarry. The present card dealt with the issue of the girl being asked to live with her grandmother leaving her own family due to financial crisis at home. Though the father portrayed in both these cartoons was depicted differently by the researcher, the children had already labeled the face of that character as an evil man. Hence, the very sight of this father figure implied 'head ache' and the girl was helpless. Perhaps, this was the subconscious giving voice to itself about how helpless children felt in crises created by adults in their life, to cope with which they constantly sought strategies.

The role of objects in the background of the cartoons, which seemed unimportant while designing, led to discussions that were more relevant than those engendered by dialogues.

While discussing the cartoon on the father who comes home drunk—

Venkatesh: That green bottle is a quarter bottle?

Vikram: How do you know?

Venkatesh: My grandfather drinks and makes me buy them so he tells me so that I can buy the right ones.

Shyam: You are great.

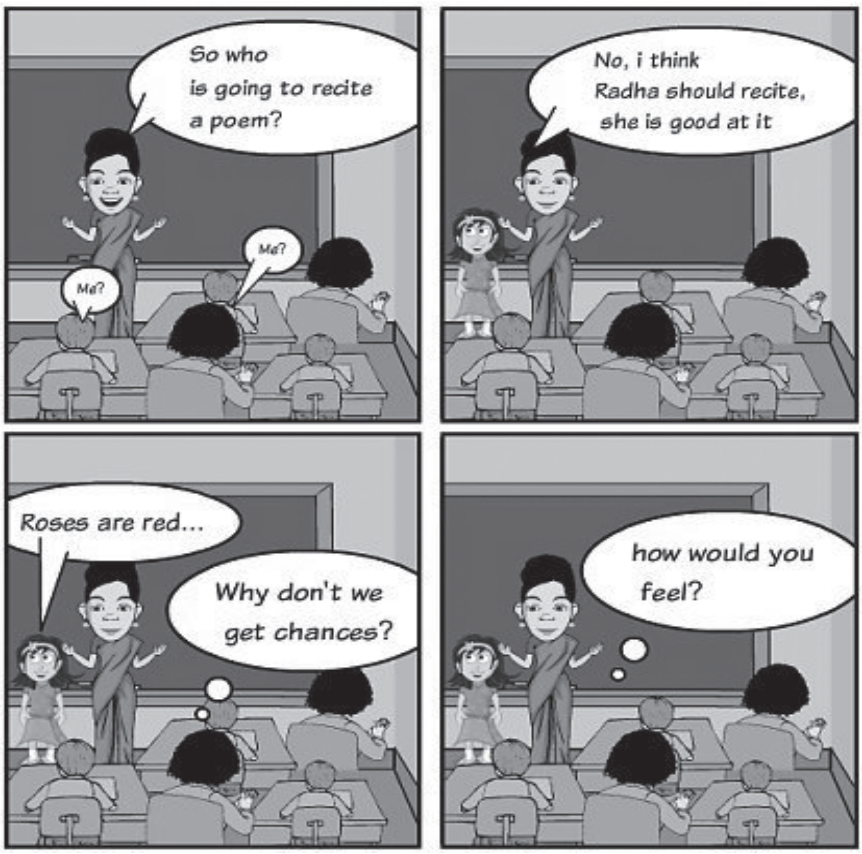
Venkatesh: I sell them later. The empty ones get you a good price.

The discussion thereafter turned towards the issue of alcoholism as intended, but the conversation was triggered because of the two green bottles depicted in the cartoon rather than the verbal clues or even human images. While designing the cartoon the researcher had no idea that the background would bring forth such spontaneous responses from the children. This further confirms the efficacy of visual stimuli.

It was interesting to come across a few faces in the school that resembled the cartoon characters, though the researcher had never met them before sketching. This too evoked a lot of interest among participants. The children who resembled the cartoons were considered heroes. There was amusement over how the researcher managed to sketch them without ever meeting them, which

established the researcher's as a person with skills. The need to keep in mind the cultural context of the study is further reinforced by this.

In another cartoon the researcher drew a girl with shoes, socks and a frock. Though the depiction was unintentional, the groups constantly queried as to why this girl looked so different from the other characters. There were a few children at the school wearing shoes and socks but these children were considered elite and unfriendly and so the negative feelings of envy towards the character in the cartoon were also understandable.



Data Analysis

The FGD's were recorded using a voice recorder. These recordings were then transcribed and translated verbatim from Tamil to English. Using Weft QDA software for analysing qualitative data

the transcripts were then coded. The codes later emerged into patterns and revealed the strategies children engaged in to cope with problems. The responses given by the children showed 22 possible strategies, which were categorised as active, passive, and neutral. Active strategies for instance meant immediate action and involvement in action while passive strategy meant action planned for future and involvement on action. In neutral strategies the problem is solved through involvement of thought and action. The strategies evolved are given below:

Active	Passive	Neutral
Dealing with anger	Lie	Wit
Advice	Hope	Philosophising struggle
Direct Confrontation	Avoidance	Belief in Faith/Luck charms
Assertive	Apologising	Economic rationale
Threatening	Other's do, We don't	Dramatic strategy
Ethical Stand	Resolving by rationalising	
Benevolence	Empathy	
Negotiation		
Scientific explanations		
Work hard		

With the help of three excerpts from the analysis, the strategies will now be explained. Sometimes the same response has been categorised under two strategies. There were also multiple responses and different strategies that expressed for the same situation.

Dealing with Anger (Active strategy): From the child's perspective, anger as a response is often found, in situations where their status of a child has been taken advantage of or they have been unable to make a crucial decision about a problem they were involved in. It has also been reported as an immediate response more or less a reflexive action that happens in the immediate context of the pertinent problem. The episode below narrates how a student copes with the problem through anger. This response was evoked by a cartoon that discussed the issue of domestic violence at home.

Naresh: My father creates similar issues daily but I come to school

Int: So how do you cope in such situations?

Naresh: Would beat my father for messing up our life.

Int: But beating father?

Naresh: He comes home drunk fights and hits our mother so we have to do something right?

See if father beats us with swelling here and there we might not miss school? If he spares us yet hits our mother we won't be able to go to school. So may be we need help. I would call my aunt and ask her to come over when there are fights. Or I need to deal with it so I will hit him back.

Usually children use parents as social reference for safety and trust. Parents form the major support systems to whom children look up to for reference or assistance when they encounter a crisis. But when they are puzzled about what is right and what is wrong in how parents behave or react in certain situations they are compelled to devise a strategy to cope with the existing situation. Their response as shown above oscillates between retaliation and anger. The same schema of problem and solution gets transferred to an external situation where the child is involved and powerless.

Avoidance (Passive strategy): Children used avoidance as a strategy to get by when faced with embarrassing or humiliating situations. Sometimes this happens in a situation where one is frightened or in some other situation where one denies acknowledging such issues at all. Avoidance as strategy is often used in the context of family in contrast to sharing when it comes to the peer group.

Augustine: Any issue if discussed at home creates tension between parents, so if we can avoid such discussions it's better for the family.

Children act out the expected roles prescribed for them by the society, by their family. Augustine in this discussion describes why he would not prefer discussing any of his problems at home. From prior experience children realize the impact of any discussion they have at home. Also the embarrassment or pain of having started a fight at home is strong and fresh in the unconscious mind of the child. It creates another reason why he chooses avoidance as a strategy over sharing information with the family.

Belief in Luck/Charms (Neutral strategy): In many instances during the interviews the words faith and luck came up. These were instances where children realised their actions would not help them get by or cope so a higher power or luck needs to be resorted to.

> Subash: I will ask my father why he drinks daily and suggest he wear the 'mala' so that he will change his ways.

Wearing of the mala (beaded chain) during the annual pilgrimage to Sabarimala is culturally an acceptable practice among many believers. One who wears the mala abstains from alcohol, non-vegetarian food and is supposed to stay calm and pious. Subash has seen his father following this ritualistically year after year and so he believes it could be a strategy that would help him cope with his father's alcoholism and related fights at home. Few other children too suggested this as a solution to coping with their father's fights and alcohol, substance abuse.

Twenty two such strategies with a total of 66 episodes were recorded from the FGD's all of which cannot be explained in this paper. The above-mentioned episodes are only three among these 66 episodes. But this paper demonstrates the process of creating cartoons and using them to elicit responses from young children in this case to understand their coping strategies which in turn denotes the Lifeskills exhibited by children when they go through crisis in daily life.

Summary of Findings

This paper attempts to illustrate the possibility of using cartoons as a potential method to elicit responses from children. The focus of this paper has been to share the fieldwork process of employing these methods in primary schools in India that cater mainly to lower income groups. While the stimuli here were researcher generated and hence could have limited the autonomy of children, basing the cartoons on a month long pilot study has proven to be effective in direct interviews. Also, employing audio-visual methods in the schools studied in this research was not economically feasible and, when attempted, created more diversions than fruitful discussions. Therefore, to understand issues sensitive and personal to the children, cartoons seemed to fare better than an oral interview with audio-visual aids. In the process of elucidating points on methodological and ethical issues in using cartoons as a tool in primary schools, this paper has also tried to link the origin of

cartoons to photography and photo elicitation methods. A deeper understanding of cartoons as a visual method in education research requires an in-depth understanding of the concepts and contexts of the study, which, in turn, facilitate the production of images and texts that can elicit meaningful responses and interactions.

The insights from the groups in which the cartoons were discussed also reveal how culturally relevant themes, faces and props matter while designing cartoons as children place great importance on these minute details. This paper has highlighted how this process was possible and is worth exploring in future researches. This method, though successful with many groups, was unsuccessful with some children. Some refused to answer questions and just enjoyed reading the cartoons making it difficult for the researcher to elicit responses. It was also noted that many who withdrew from participating in the discussion found non-academic activities boring or confusing. There were concerns among children that they would not be graded for this activity. This dulled the motivation to perform as in classrooms they were used to being reinforced for giving an answer. The fact that 'mediocre' children could participate and give answers made the top academic achievers in those groups uncomfortable. However, for 'mediocre' children who were constantly plagued by the fear of producing the wrong answer, to be part of a group where such fears were absent seemed motivating enough and they participated whole-heartedly. However, all this has more to do with peer relationships rather than the failure of the method of cartoons. In fact, an activity of this nature brought out these differences among children which in turn became topics that the groups could explore and discuss further.

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Challenges and Issues in Environmental Studies (EVS) Teaching at the Primary Stage

Bharti Dogra*

Abstract

Environmental Studies (EVS) is an integrated course on sciences and social studies for classes III to V. NCF (2005) has recommended use of thematic approach for EVS teaching. The entire EVS syllabus is divided into six themes which are further divided into sub themes. Another highlight of present EVS syllabus is Social Constructivist Perspective of learning. The emphasis is to impart not only conceptual knowledge but also develop process skill in students. Why should we expect so much from EVS teachers when they themselves were never taught during their school days through investigatory approach or never prepared later to teach this new EVS syllabus? EVS teachers in such a case are unable to transact the curriculum in the right spirit. These important aspects of the EVS teaching-learning become big challenges for them. This paper is an attempt to find out the challenges and issues faced by the EVS teachers and it also helps in formulating simple strategies to convert these challenges into opportunities.

Introduction

Environmental Studies is an *integrated* course on sciences and social studies for classes III to V. Integration means crossing the traditional boundaries of disciplines and deciding the priorities in a shared manner. There is also a shift from *topic based approach to thematic approach*. The syllabus for classes III to V in NCERT books is woven around six common **themes** which are further divided into **sub themes**. Thematic approach provides freedom and flexibility, providing opportunities to children to contribute personal interests

* *Reader*, School of Education, IGNOU, New Delhi

and ideas (*child centred approach*) and also enabling the teachers to respond spontaneously to events which might be used as a starting point. Present EVS syllabus is also based on *Social Constructivist perspective* of learning. It is hoped that children will be supported to construct knowledge far beyond their individual abilities through appropriate questions, discussions with adults in school and also at home along with among themselves (NCF–2005). Therefore, there is a shift in EVS curriculum from *key concepts to key questions*. EVS curriculum also focuses on developing an *awareness and sensitivity towards environment*. But there many challenges and issues faced by the EVS teachers in transacting the curriculum. This paper is an attempt to find out the challenges and issues faced by the EVS teachers and it helps in formulating simple strategies *to convert these challenges into opportunities.*

Research Questions

The research questions that guided this study are:

1. What are the challenges and issues faced by the EVS teachers, particularly with reference to *objectives of teaching EVS* (NCF–2005)?
2. What are the challenges and issues faced by the EVS teachers particularly with reference to i*ntegrated approach* and *thematic approach?*

The answer to these questions is important because teachers (in this particular case, EVS teachers at Primary stage) need to understand the importance of child centred EVS curriculum where child is the main focus. According to NCF (2005) the objectives of teaching EVS include – (i) to arouse the curiosity about the world (natural environment, artifacts and people); (ii) to engage the child in exploratory and hands on activities; (iii) to emphasise on design and fabrication, estimation and measurement as a prelude to development of technological and quantitative skills of later stages; (iv) to develop basic language skills: speaking, reading and writing not only for science but through science; (v) activities help in the development of basic cognitive and psychomotor skills through: language, observation, recording, differentiation, classification, inference, drawing, illustrations, design etc. The primary aim of the instruction has become helping students acquire skills rather than gain scientific knowledge. Science learning has, therefore, been viewed as *construction of scientific knowledge* by the learner via observation and experimentation. Thus, the metaphor "students as

scientist" (Driver, 1985) come to the fore with its main emphasis on scientific process skills. In this line, teaching methods shifted from lecture-based towards student-centred approaches.

Thematic approach is used in EVS teaching which helps teachers to organise practical activities and supports students by allowing them to move at their own pace and level. Integration facilitates connections**.** Students learn by making connections; the more connections they can make, the more they learn (Caine and Caine, 1997; Jensen, 1998)**.** Oddleifson (1994) points out that thematic instruction is also consistent with Howard Gardener's theory of multiple intelligences because learners possess different intelligences and thematic or integrated curricula presents new knowledge and skills in ways compatible with the various intelligences of learners.

But if teachers do not understand the meaning and purpose of integrated and thematic approaches in EVS teaching, then children will suffer and their foundation for a sound learning of science will also be badly affected. If the EVS teachers' understanding is not congruent with the principles underlying EVS curriculum or if they are facing some constraints in implementing the EVS curriculum then the purpose with which EVS curriculum is framed loses its value. Hence knowing the challenges and issues faced by EVS teachers is a prerequisite before suggesting any remedies.

Methodology

The data was collected from the 40 EVS teachers of *two* Air Force Schools and *five* Army Schools located at Delhi Cantt. The author prepared a questionnaire for EVS teachers and it consists of 11 items. These items are related to Thematic Approach (3 items, MCQs), integration of science, social studies and other subjects (1 item, descriptive), Child centred approach (1 item, MCQ), Key concepts to key questions (1 item, MCQ), EVS activities (2 items, Descriptive), Designing simple devices for simplifying science concepts (1 item, Descriptive, Objectives of EVS teaching, NCF 2005), Language development through teaching EVS (1 item, Descriptive, Objective of EVS teaching, NCF 2005), Table on Seven skills, activities and content covered (Descriptive, Objectives of EVS teaching, NCF 2005).

Along with filling this questionnaire, EVS teachers were also expected to attach ONE lesson plan on any topic from EVS syllabus and ONE page write up on any hands-on activity along with the content covered and reactions of the learners

This questionnaire includes a combination of closed ended as well as open ended questions. Open ended questions are provided

to provide respondents an opportunity to justify their point of view. After developing the first draft of the questionnaire, it was shown to four elementary teacher educators who are teaching in B. El. Ed. (Bachelor in Elementary Education) in different colleges of Delhi University. Their opinion was sought and two items were deleted and the two items were modified. A pilot trial run was done with 11 EVS teachers (sub sample of the target population). EVS teachers in the pilot sample were asked to give their detailed feedback about the questionnaire itself like time taken, which questions they found ambiguous or leading or biased or not related to EVS teaching at primary level. The results of the collected data from these 11 teachers were analysed to see if all the EVS teachers or majority of them have some suggestions or observations regarding the items of the questionnaire. One item of the questionnaire was slightly modified as per their suggestions.

Data Collection

The data was collected in the month of April 2012 by visiting two Air Force Schools and five Army Schools located at Delhi Cantt. The **purposive sampling** technique was used for collecting data. In other words, the researcher used her experience and knowledge of the group to be sampled. The respondents are 40 **female in-service EVS teachers**. There is no EVS teacher with B. El. Ed. (Elementary Education) qualification. The EVS in-service teachers are arts and science graduates and postgraduates. The respondents include:

Table 1: Details of EVS In-service Teachers

S. No.	Name of the School	No. of Teachers	Qualification			Experience of Teaching EVS (Years)		
			B.A./ B.Sc B.Ed.	M.A./ M.Sc./ M.Ed.	M.Phil/ Ph.D.	Upto 5 Years	5-10 years	> 10 Years
1.	Army Public School Shankar Vihar	5	1	4	—	1	4	—
2.	Army Public School Ridge Road Dhaula Kuan	6	2	4	—	1	3	2

3.	Army Public School Delhi Cantt.	6	2	4	—	1	2	3
4.	Delhi Area Primary School-I Pratap Chowk	6	2	4	—	2	2	2
5.	Delhi Area Primary School-II Sadar Bazar	7	—	6	1	5	1	1
6.	Air Force Golden Jubilee Institute Subroto Park	6	3	3	—	—	2	4
7.	The Air Force School Subroto Park	4	1	3	—	—	4	—
	Total No. %	40	11 **27.5%**	28 **70%**	1 **2.5%**	10 **25%**	18 **45%**	12 **30%**

Seventy per cent of the EVS teachers are arts or science post-graduates with B. Ed. /M. Ed. whereas 27.5 per cent EVS teachers are arts/science graduates with B. Ed. Only one EVS teacher has done M. Phil. 45 per cent EVS teachers have experience between 5-10 years. 30 per cent EVS teachers have more than 10 years of experience. Few EVS teachers have more than 20 years of experience. 25 per cent EVS teachers have less than 5 years of experience.

Since the sample size was quite manageable, the researcher made some additional efforts either by talking to the respondents or by visiting their schools and getting a glimpse of their lesson plans and observing their classroom teaching to triangulate data and validate the response trends that they received on the questionnaire.

Data Analysis

In the questionnaire, there are 3 types of items:

1. Item 1, 3, 5 and 6 are multiple choice items. For multiple choice

items, the correct responses and incorrect responses (if any) were first counted and then subsequently calculated for its percentage.

2. Item 2, 4 and 7 are subjective but with almost fixed choices. For these items, the responses were noted down and categorised and qualitative analysis was done.
3. Items 8, 9, 10 and 11 are subjective with lots of options. Qualitative analysis was done. The researcher had gone through the responses more than once and identified the key points which were then categorised and overlapping points were discarded.

ONE lesson plan and ONE page write up on activities conducted, submitted by each EVS in service teacher along with the filled questionnaire further helped the researcher in validating the contents.

Table 2: Responses of EVS Teachers to Multiple Choice Items

Item No.	Statement	Response	No. of Respondents
1.	The syllabus of EVS from Class III-IV is based on how many themes: Item No. 2 is related to Item No. 1	3	**28** (70%)
		7	**1** (2.5%)
		6	**11**(27.5%)
		10	—
3.	(Tick which is applicable) Thematic approach helps me in teaching EVS better by	(a) Integrating topics	**23** (57.5%)
		(b) Organising activities	**3** (7.5%)
		(c) dissolving traditional boundaries of disciplines	**2** (5%)
		(d) connecting to child's world	**12** (30%)
5.	(Tick which is applicable) Meaning of child centred approach is, curriculum should be based on	(a) children's needs and interests	**2** (5%)
		(b) age of children	—
		(c) daily life experiences of children	—
		(d) all of the above	**38** (95%)

6.	(Tick the incorrect answer) Shift from Key Concepts to Key Questions in EVS Teaching implies	(a) stimulating children's learning	**3** (7.5%)
		(b) scaffolding their learning	**13** (32.5%)
		(c) supporting their understanding far beyond their individual abilities	**16** (40%)
		(d) facilitating their interaction with the environment	**8** (20%)

In **item 2**, EVS teachers were expected to write about the names of themes. Most of the teachers (70%) have mentioned *three* themes which are (i) Social Sensitivity; (ii) Environmental Awareness and (iii) Concept formation. Only 27.5 per cent EVS in-service teachers have shown their awareness about *six* themes which are (i) Food; (ii) Family and friends; (iii) Travel; (iv) Water; (v) Things we make and do and (vi) Shelter. Only one EVS in-service teacher (2.5%) has mentioned 7 themes. In NCERT syllabus, there are SIX themes.

Most of EVS teachers (57.5%) believe that thematic approach helps in integrating topics. Thirty per cent EVS teachers feel that thematic approach helps in connecting to child's world whereas 7.5 per cent EVS teachers are of the opinion that thematic approach helps in organising activities and only 5 per cent EVS teachers are of the opinion that thematic approach helps in dissolving boundaries of the disciplines.

Ninety five per cent EVS teachers believed that child centred approach means, curriculum should be based on children's needs and interests, age of children and daily life experiences of children whereas only five per cent EVS teachers are of the opinion that child centred curriculum only depends on children's needs and interests.

When asked shift from about key Concepts to key Questions in EVS Teaching 40 per cent EVS teachers agreed that it helps in supporting children's understanding far beyond their individual abilities. 32.5 per cent EVS teachers were of the opinion that key questions help in scaffolding children's learning. Twenty per cent EVS teachers felt that key questions help in facilitating children's interaction with the environment and only 7.5 per cent EVS teachers linked it to stimulating children's thinking.

Item 4 Give two examples that show how you integrated social studies, science, language and maths in your EVS classroom.

Out of 40 respondents, only **Three** EVS teachers have answered this question keeping in mind the integrated approach: **Water**

Cycle: Science – Evaporation and condensation; Language – Paragraph on 'If I were a rain drop'; Social Studies – Places with high/scanty rainfall; Maths – Problem sums of volume of rainfall during monsoon; **Festivals :** Science — Festivals related to phases of moon; Language – Paragraph: My Favourite Festival; Social Studies – Cultural diversity of India; Maths – Calendar reading and calculating days between two given dates; **Understanding of Maps:** Social studies – Countries, Places; Language – far and near, above and below; Maths – Measurement; **Travel :** Social studies – Space, globe; Language – Poem; Maths – Time; **Food Nutrients**: Science – Nutrients in food items; Language – Why should we avoid junk food? (Paragraph); Social Studies – Food grown in different States and different seasons; **Means of Transport:** Science – Great Inventors; Language – Paragraph on Road Journey; Social Studies: Places visited by child during train journey.

Item 7 Name the strategies used by you to arouse the curiosity in children.

The main strategies highlighted by 40 EVS teachers are discussions, hands-on-activities, puzzles and quizzes, by showing them models, by asking open ended questions, visiting different places, group work, showing pictures/illustrations, by giving examples related to everyday life, designing apparatus and community based projects.

Item 8 Do you conduct activities for teaching EVS? What activities do you conduct for teaching EVS? Please give examples of activities along with the content that it covers from the syllabus. What problems do you generally face while planning and executing such activities? What problems do your colleagues face in using activities while teaching EVS? (Kindly use the following table columns to complete your answer — attach a separate sheet for this)

In this item 8, EVS teachers were expected to write about different activities conducted along with content covered from the syllabus and problems faced. The responses were tabulated and summarised discarding overlapping ones. Table 3 contains the description of activities conducted, content covered from syllabus along with the problems faced.

Item 9 How can you encourage science learning by designing simple devices for simplifying science concepts? Give examples of such devices and the content they cover? How many such devices have you used in your classes? What were your experiences? (Kindly use a separate sheet for the same)

Table 3: Responses of EVS Teachers Related to Activities Conducted

S. No.	Activities conducted	Content covered from the Syllabus	Problems faced by the teachers
1.	To observe the process of germination	Plants Around Us	Time constraints, space
2.	Evaporation and Condensation	Water Cycle	Difficulty in handling apparatus due to safety reasons
3.	Test for starch	Carbohydrates: energy giving foods	Iodine is toxic so need to dispose of all food samples carefully
4.	Visits to neighbourhood market, religious places, hospitals	Important places in neighbourhood	Arranging conveyance for visits, time constraint
5.	Group work (Each group is given ONE nutrient and they are expected to collect food items)	Importance of food, Types of food, balanced diet	Time constraints, disciplinary problems
6.	Drying of leaves from fruit trees and paste them in a notebook	Food from trees	Time constraints, disciplinary problems
7.	Tasting different food items	Our body	Time constraints, disciplinary problems
8.	Collage with pictures of living and non-living things	Living and non-living things	Poor cooperation of the parents
9.	Enactment	Solar system (rotation and revolution movements of earth)	Lack of individual attention, Time constraints, disciplinary problems
10.	Flash card activities	Birds, Animals (e.g. match beaks and claws of birds)	A lot of preparation required on the part of the teachers
11.	Blowing a balloon	Air occupies space	Disciplinary problems
12.	Candle activity	Air supports burning	Student safety

13.	Torch activity on a globe	Occurrence of day and night	Non-availability of a dark room
14.	Shadow clay activity (guessing the name of the animal by seeing its shadow)	Herbivores, Carnivores, Omnivores, Food-chains	Safety of the learners
15.	Animal Picture Postcard	The Animal world	Some students could not comprehend
16.	Family tree	Relationships, hereditary characters and type of family (nuclear/ joint)	Not all children could get the photographs of their family members and had to do with just names.
17.	In a map of India, mark major rivers and seas surrounding India.	Water bodies in India	Group activity and needs a lot of space and materials which are not readily available.
18.	Play card activity	Helpers, Transport, Our natural resources	Difficulty in comprehending the questions asked by learners.

Devices were used by very *few EVS teachers* for simplifying science concepts like (i) a model of lungs to show the inhalation and exhalation of air to students using balloons, straws and a plastic bottle; (ii) a model of rain water harvesting to teach students the technique of storing rain water in underground tanks; (iii) a model of stethoscope to listen to the heart beat; (iv) making biodegradable and non biodegradable bins to throw garbage to teach environmental sanitation; (v) to make a first aid box; (vi) Periscope and kaleidoscope to teach reflection and refraction of light; (vii) Sundial using a basic drinking cup and a straw; (viii) Diorama to project habitats e.g. rainforest, undersea etc. (using a shoe box); (ix) Wind mill or wind generator to explain the concept of wind energy; (x) Toy telephone using empty matchboxes while teaching communication; (xi) Light and Ball model to explain the rotation and revolution of earth and also about solar system; (xii) Model of traffic light to explain the relevance of red light, green light and yellow light

Item 10 Can we foster language development through teaching of EVS in our classes? What strategies do you use to foster language development of your students? Please provide examples for fostering development of language skills through science? (Kindly use a separate sheet for the same)

Fostering language development through teaching of EVS is an important **objective of EVS curriculum** (NCF–2005). Most of the

EVS teachers have mentioned that speaking, writing and listening skills can be enhanced through EVS teaching. EVS teachers have not mentioned **any** strategies for fostering language development. Very few EVS teachers (only 2-3 EVS teachers) have mentioned the strategies like (i) Creative writing – Topic: The day we did not get a drop of water; Content covered: Water for all and (ii) Group Discussions – Topic: Earthquake as a disaster; Content covered: Our responsibility during Natural Calamities.

Item 11 Complete the following table that help us gain an understanding in how science activities can help foster other skills in students

Item 11 is related to **Objectives of teaching EVS** (NCF–2005). The responses are summarised at Table 4.

Discussion and Implications

The responses of EVS in teachers hardly reveal worth seeing pictures of classrooms where teachers provide children opportunities to make observations and then relate them to their own experiences. Children must be provided opportunities to explore things (objects, processes), classify and to formulate their own conclusions. Thus, the purpose of teaching EVS is not realised in most of the classrooms. Only three EVS teachers have given examples to show how they are integrating social studies, science, language and maths in their EVS classrooms. Integration is required because differentiation of knowledge is not a natural phenomenon. The implementation of curriculum integration, however, is not easy for many teachers, primarily because they are not prepared for it (Czerniak, Weber, Sandman, and Ahern, 1999; Pang and Good, 2000).

Most of the activities are either conducted by the EVS teachers or conducted by students in groups. There are hardly any individual activities where they themselves can perform experiments. EVS teachers have mentioned the activities in detail but in no case it is mentioned that how an activity helped in understanding the content. *An assessment of understanding of children needs to be planned.* EVS teachers must ask themselves few questions before planning or conducting any activity like why am I doing this activity? EVS teachers must give children a reason for their work. Time constraints, lack of space, difficulty in handling apparatus and indiscipline are mentioned as problems by most of the EVS teachers in organising activities, in this study. Teachers claim they lack the time and knowledge to organise activities and resources for science (Scott, 1989) and report negative experiences with group work and classroom management during science lessons (Goodrum, Cousins, and Kinnear, 1992).

Table 4 : Responses of EVS Teachers related to Activities Conducted to Develop Different Process Skill

Skill	Activities	Content
Promoting observation in children	**Observe** plants, different types of houses, germination of seeds, different types of dresses worn by people **Visit** Zoological park, Botanical Garden, Nehru Planetarium, Nature Walk	Types of Plants, Types of Houses, Stages of Germination, Variation in Dresses Herbivores, Carnivores and Omnivores, Knowing about different plants, their parts and interdependence, Heavenly Bodies, Plants, Sounds we hear
Recording the observations	Simple activities with water, Max. and Min. Temp. every month, functions of different body parts, growth of sapling, Time of sunrise and sunset, Objects that float and sink in water, Test for Starch	Properties of Water, Seasons, Our Body, Plant Growth, Natural Phenomena – Day and Night, Experiments with Water, Carbohydrates
Classification of objects (living/non-living)	Soluble and insoluble substances, Collage of Living and Non-living things, Classification of Plants	Properties of Water, Living and Non-living things, Classification of Plants
Drawing	**Draw** different types of Houses, an insect/imaginary animal, a map of the route from your house to nearest shop, Balanced Diet Chart, Tap Root and Fibrous Root System, Water Cycle, Herbs, Shrubs and Trees	Houses, Animal Adaptations, Landmarks, Neighbourhood Roads, Food Nutrients, Types of Roots, Water Cycle, Classification of Plants
Making conclusions	**Discuss** Critical Pathology report of Anaemia, Experiments, **Observe** Sky and make weather forecast, Substances which dissolve and which do not dissolve,	Treat for Mosquitoes, Weather, Solubility in Water
Illustrations	Solar System, Different parts of the insects, Means of Communication like TV, Radio, Newspapers, Tools used in Farming	Solar System, Insects, Communication, A Seed tells a Farmer's Story
Fabrications	Kaleidoscope, Water Purifier, Wind mill, Making a pot from used plastic bottle	Things we make and do, Water, Wind energy, Best out of waste

Although EVS teachers have mentioned a number of simple devices used for teaching EVS but most of them do not understand the difference between activities, teaching aids and simple devices. Designing of simple devices in the teaching of EVS goes a long way in fostering an interest in learning by doing. There are many simple devices which children can prepare themselves under the guidance of a teacher. This will help children in understanding the working of actual devices. Use of activities as well as simple devices in EVS teaching-learning process is effective if and only if it is well embedded in the **context**.

Very few EVS teachers have mentioned strategies for fostering language development through science. All approaches to science instruction require language. Poems and stories on animals, plants and water etc. must be an integral part of EVS teaching. The most important aspect is to engage students in inquiry science instruction. When students engage in inquiry like a scientist then they are engaged in hands-on experimentation, describing objects, processes, events etc. Thus, learners engage in authentic communicative interactions — describing, hypothesising, explaining, justifying, argumentation and summarising — which promote purposeful language (Lee and Fradd, 1998). They can communicate their understanding in a variety of formats, for example, in writing, orally, drawing, and creating tables and graphs (Lee and Fradd, 1998).

Most of the EVS teachers are not aware how science activities can help in developing process skills like **observation** (using the senses, identifying differences between similar objects; identifying similarities between different objects), **recording observation,** classification, drawing, making conclusions, illustrations and fabrications. Science (EVS in this particular case) learning helps in acquiring concepts, process skills and attitudes. To understand the world, we need to understand the concepts, which to a large extent depend on the use of process skills. The two are interdependent: as concepts gradually become more sophisticated, so process skills need to be refined and extended (Harleen and Elstgeest, 2012). Development of both must go hand in hand. A number of activities can be planned for the learners — experiments, visits etc. What is most important is to involve them in each and every stage whether planning an activity, doing it, preparing a report or presenting it through presentation/poster, then discussion on what they did and how they did (reflect and learn from mistakes), respond to questions of other students (listen to alternative suggestions, politely receive

constructive suggestions). Asking questions at each stage of the activity makes it scientific.

Are teachers actually teaching EVS in an integrated manner? What is the meaning of integrated approach? How to integrate sciences and social studies at primary level? In classroom practice subject matter knowledge is part of a professional practice, developing on the basis of discipline knowledge, a value and goal system, an action repertoire and occupational knowledge in teaching practice and interaction with students, colleagues, teacher educators, researchers or parents. Change from discipline-oriented knowledge to integrated science teaching is an outcome of changes in the professional self (Bauer, 1999). EVS teachers must be oriented to the investigatory, inquiry oriented activities which they are expected to conduct for their learners. Such orientation programmes again should not be imposed on EVS in service teachers. EVS teachers must find, these sciences related activities a fun and must enjoy them so that they should feel like doing it with their students. The problems faced by EVS teachers must also be given due consideration. EVS curriculum can only be implemented with the help of motivated, enthusiastic, ever ready to learn, ready to experiment teachers who are supported by peer teachers, parents and administrative personnel. Years of experience of teaching EVS is a variable of interest in the study. The strategies adopted by more experiences and less experienced EVS teachers need to be compared.

With reference to the first research question formulated in this study, EVS teachers face a lot of challenges and issues particularly with reference to objectives of teaching EVS (NCF, 2005). According to (NCF, 2005), (i) arousing the curiosity about the world (natural environment, artifacts and people) is very important. The strategies used by EVS teachers could not provide children plenty of opportunities to explore, to manipulate their environment and obviously to know more about himself and/or his environment. Another objective is (ii) to engage the child in exploratory and hands on activities. Children were hardly given any opportunities to explore things (objects, processes), classify and to formulate their own conclusions. Thus, the purpose of teaching EVS is not realised in most of the classrooms. (iii) Emphasising on design and fabrication, estimation and measurement as a prelude to development of technological and quantitative skills of later stages is another important objective of EVS teaching. Very few EVS teachers are using simple devices for simplifying the concepts but that is not enough.

(iv) Developing basic language skills: speaking, reading and writing not only for science but through science are another important objective of EVS curriculum (NCF, 2005). Although most of the EVS teachers have mentioned that speaking, writing and listening skills can be enhanced through EVS teaching but they are not clear about the roadmap for achieving this. Another important objective is (v) to conduct activities to help in the development of basic cognitive and psychomotor skills through: language, observation, recording, differentiation, classification, inference, drawing, illustrations, design etc. but most of the EVS teachers are not aware how science activities can help in developing process skills.

The second research question addresses the challenges and issues faced by the EVS teachers in implementing the thematic and integrated approach to EVS teaching. The findings show that only ***three*** EVS teachers could understand the actual meaning of integrated approach. Very few EVS teachers were of the opinion that thematic approach helps in connecting to child's world.

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Educational Change and Teachers' Pedagogical Content Knowledge (PCK) — Integration for Professional Development

Astha Saxena* and Alka Behari**

Abstract

*The world is passing through a phase of transformational change. The state, the economy, the society and the ecology are changing in ways that have compelled individuals and nations to confront the aeonian question of what we are and what we aspire to be. Education must facilitate human quest in search of answer to this question. And, if education has to serve this purpose, role of the teachers in this regard can hardly be emphasised. A candle has to burn itself to be able to enlighten the path of others. Likewise, the teachers must brace up not only to the emerging discourse in their respective disciplines but also, and, equally importantly to the ways through which it may be possible for them and their students to construct, deconstruct and reconstruct their worldviews and the paradigms of knowledge. Teacher education is a discipline whose prerogative is to innovate and research upon ways towards betterment in education in its various fields such as curriculum, pedagogy, learning, assessment, etc. One of the variables in teacher education that has been very prominent in teacher education researches has been, Pedagogical Content Knowledge (PCK)***. The underlying contention of the present paper is whether PCK as a construct can in any way prepare our teachers to adapt and deal with the educational change prevailing within their context. For this purpose, a study was carried out with a sample of in-service teachers so as to know about the present notions of educational change amongst our teachers and their own ways of*

* *Research Scholar*, Central Institute of Education, Delhi University.
** *Associate Professor*, Central Institute of Education, Delhi University.

*** PCK embodies the aspects of content most germane to its teachability. Within the category of pedagogical content knowledge I include, for the most regularly taught topics in one's subject area, the most useful forms of representations of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations—in a word, the ways of representing and formulating the subject that makes it comprehensible to others…." (Shulman, 1986).

confronting them. The results indicated a mixed response in terms of teachers' understanding about educational change per se and their ability to deal with the change, if they happen to identify any. The study has its implications for the pre-service as well as in-service teacher education programmes.

Introduction

"Teaching" and "Pedagogy" are two terms that are very often used in the culture of classroom teaching learning and are so often used synonymously, but they imply very different meanings. Teaching refers to the act of influencing the ideas and knowledge of the learner by creating a bridge of communication that is in conventional terms a one-sided affair. However, pedagogy refers to the 'science of teaching' and not merely an art, as it is deeply embedded in the cognition of the teacher and has come up as a result of years of experience, experimentation and reflection. Thus, teaching represents the behavioural component whereas pedagogy is the psychological component. The behavioural component is easier to assess and report but it is the psychological component that is difficult to explain as well as report. Pedagogy however is not a singular term as it has so many other factors and variables that impinge upon it to give it different meanings for different individuals at different points of time. These other factors can be the teachers' own experience, beliefs, values, knowledge of transactional strategies, curriculum, assessment patterns adopted by the school or individual teacher, as well as school's cultural context and environment. All these factors taken together frame the pedagogy adopted by the teacher in the classroom (Integrated approach). All the above listed components of teachers' knowledge repertoire have been researched individually by many researchers, but a holistic understanding of pedagogy can only be generated if all these factors are taken together. For the first time it was Shulman in the late twentieth century who coined one term that could coalesce various facets of teachers' knowledge repertoire called as 'Pedagogical Content Knowledge (PCK)'. Soon the term gained significance in the education sector with many researches in this area teaming up to give newer dimensions to it. Although the concept has evolved and many researchers have advocated its significance in effective teaching learning both at school as well as university level, but is still in its infancy in terms of integrating such a component in the curriculum for teacher education. In

order to integrate such a component within the teacher education curriculum, a need to link it with some of the broader educational aims and objectives is required. One of the educational aims of the present century is to cater to the present demands of the changing world. The globalised scene today warrants a better connected educational network for fulfilling the educational requirements of those to whom formal education is inaccessible, besides vocational and technical education have acquired predominance over theory based education for an independent life style of today.

Therefore the objective of writing the present paper is to highlight the need and significance of Pedagogical Content Knowledge (PCK) in guiding prospective teachers toward adapting and tackling educational changes happening within a country or globally and hence in transforming the present structure and function of teacher education programmes going on in the country. The two research questions that have guided the present study are as follows.

1. What is the present understanding of our teachers about the changing educational world?
2. Are the classroom transaction processes in terms of content delivered and pedagogy adopted in consonance with the demands of changing world scenario?

Theoretical Framework

"Educational Change" and Its Meaning

In order to understand educational change, we first need to know what we mean by "change". Change can be defined and understood as having various parameters such as ecological change, developmental change, economic change, social change, changing lifestyles, changing technology, changing requirements for food, energy and resources, etc. These are the changes that are happening in the world or in any country like India. It is seen that one change breeds another, for instance changing life styles have created changing food habits and changing nutritional requirements for people. Similarly, changing requirements for energy, has led to industrial growth, leading to changing ecological and environmental patterns. Now, coming back to "educational change" that is again impacted and affected by phenomena such as changing world picture in terms of globalisation and mass communication; changing patterns of growth and economics, as well as changing meanings of learning (Dalin, 1978). All of the above mentioned factors have created newer

realms of teachers' knowledge and more to say this has assigned newer roles and responsibilities to them. Thus, preparing our future teachers to deal with these educational changes should be the task of any teacher education programme. Pedagogical Content Knowledge (PCK) can offer a means as to integrate this educational change in the curriculum for teacher education at the content level, while transforming the same knowledge for teaching and transacting it in the classroom at the process level.

"Pedagogical Content Knowledge" the Construct

The different facets of a teacher's knowledge base were for the first time researched and reported by L. S. Shulman in the year 1986 in his famous work- "Those Who Understand: Knowledge Growth in Teaching" as well as in another famous work in the year 1987- "Knowledge and Teaching: Foundations of the New Reform". The different knowledge bases as discussed above have been integrated into one single whole called as "Pedagogical Content Knowledge (PCK)" but have a cumulative effect on teachers' cognition as asserted by Shulman who also coined the term. Defining PCK in his own words—

"The category of PCK includes – the most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, demonstrations, examples, explanations, and ways of representing and formulating the subject that makes it comprehensible to others. PCK also includes an understanding of what makes the learning of specific topics easy or difficult; the conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning of those most frequently taught topics and lessons."

However, since the introduction of the term PCK many different meanings have been connoted to it, there have been very many debates amongst those in the educational fraternity including teachers, researchers, educational psychologists and curriculum developers. They regard the notion of PCK as highly structured and deterministic, leading to its many modified versions. Some of the points on which the concept of PCK has been critiqued include:

Integrated vs. Transformative Role of PCK: The different models of PCK purported here by different researchers suggest that PCK is an amalgamation or blend of different knowledge bases that are different but integrated in order to attain a wholesome teaching-learning experience. This is the integrated view of PCK (Nillson,

2008). One of the criticisms of this conceptualisation is that the integration of different components might still not give rise to a holistic model for understanding and could possibly lead to many imbalances in teaching where focus on content could predominate pedagogy or vice versa. 'Transformation' of knowledge is another conceptualisation which is akin to a compound in chemistry, where the various constituents form a given compound but the parts cannot be identified separately as they are so deeply ingrained that it's almost impossible to filter out each component. Such kind of teaching offers a seamless blend of teaching strategies so as to give rise to innovative planning and some of the best teaching practices related to a specific topic. However, some of the problems encountered by many critics have been that it refers to a cook-book kind of recipe that tends to fit in any situation and with anyone applying the already proven strategy to achieve the expected learning outcomes (Newsome and Lederman, 1999). Thus, teachers' individuality and creativity is not taken into account.

Too many Categories and Diffused meaning of PCK: The current view of pedagogical content knowledge tends to move beyond the listings of the categories and segregation of teachers' knowledge into sub-components, rather takes a more contextualised view of the whole issue of teachers' knowledge base, by taking into consideration certain covert aspects such as cognitive processes behind teachers' decision making about a particular pedagogy, teachers' own experiences as a student and as a student teacher, culture of the classroom as well as teachers' own, etc. Some times in the wake of including so many categories of knowledge in one term called 'PCK' makes it highly diffuse and the concept tends to lose sight of its topic-specificity with which Shulman had started (Van Dijk, 2009). In order to retain its topic specific character, the core elements of PCK need to be analysed.

PCK and its Role in Transforming Teaching and Teacher Education—a review of Literature

PCK is not only a theoretical construct rather a practical and reflective component of teachers' knowledge. It has its implications mainly concerned with the practice component of teacher education programme rather than theory. Breaking down the term PCK gives rise to different sub-components such as pedagogical knowledge, subject matter knowledge, and knowledge about the context, curriculum, and assessment strategies. These components have already been

identified and reinforced in various curricular documents. Some of the thrust areas that the documents (Curriculum Framework for Teacher Education, 2004) on teacher education envisage include preparing teachers to **integrate indigenous knowledge** in the theory and practice of modern educational thought; empowering them to evolve **culture-specific pedagogy** for the learners; capacity building in utilisation of new findings of research, community experience and institution-based and field-based experiences; developing an **integrated and holistic approach** in the teaching of social sciences and science and technology; and empowering teachers to inculcate **values** among learners embedded in different subjects. There has been a special emphasis on the role of classroom pedagogy in bringing about an educational change in the *National Curriculum Framework (NCF)–2005*. The educational change that the document envisages includes a central focus on democracy, issues related to human rights, caste, religion and gender by adopting a *'critical pedagogy'* approach. Critical pedagogy facilitates collective decision-making by encouraging and recognising multiple views and opinions of all the participant students belonging to different sects of society, such that their voices are not neglected or suppressed rather contribute in the process of knowledge construction (pp. 23, *NCF-2005*). Although these areas specified in these documents are not directly related to PCK but contribute to it in some way or the other.

The present NCF document stresses the need for curriculum renewal for teacher education by stating that the present teacher education programme is insufficient for creating better equipped and reflective professionals. According to it, the teachers lack the necessary expertise to develop linkages between school and society and are reluctant to conduct educational experiments. The incapacitance of teacher education programmes is clearly reflected in the following lines in the document.

"Most teacher education programmes provide little scope for student-teachers to reflect on their experiences and thus fail to empower teachers as agents of change." (pp. 107, NCF–2005)

Thus, keeping in view the above arguments made in some of the national documents, a need is felt toward renewing the curriculum for teacher education for which PCK provides a ray of hope. In the west, however the construct PCK has contributed to many researches in the area of teacher education. The following are some studies that provide evidence for the emancipatory role played by PCK in teacher education.

S. No	Researcher (Year)	Sample Chosen	Major Findings
1.	Loughran et. al. (2008)	In-service teachers	Active construction of Co-Res and PAP-ERs helps in the better understanding of teachers' PCK as well as enhances student learning.
2.	Bucat (2004)	In-service teachers	Calls for an articulation of years of professional practice as PCK of the experienced teachers so as the novices can gain from it as well as apply it in their own teaching-learning by recognising and adapting it with the present cultural and environmental context.
3.	Bollough Jr. (2001)		PCK is a construct that is known to have a direct influence over teaching efficacy and student learning, therefore has an integral role to play in educational sphere, both in content and practice.
4.	Dijk and Kattmann (2006)	In-service and Pre-service secondary science teachers	PCK of experienced teachers can inform and improve upon prospective teachers' practices of teaching-learning and a programme has been designed in this regard called as ERTE (Educational Reconstruction for Teacher Education).
5.	Van driel et al (1997)	In-service upper secondary chemistry teachers	A developmental model of PCK came up as a result of in-service workshop sessions with the in-service teachers during which discussions and deliberations were carried out, that lead to teachers' in-depth understanding of the concepts as well as learning about students' difficulties and misconceptions and overall lead toward the enhancement of teachers' PCK. Also implications have been provided for teacher

			education programmes to include this construct of PCK as in the theory (subject related difficulties and teaching of specific topics) and practical component (applying PCK to actual classroom situation).
6.	Mulhall and Berry (2004)	Fifty high school science teachers	This particular longitudinal study proved that the methods used in documenting and articulating PCK i.e., content representation (Co-Re) and pedagogical and professional experience repertoires (PAP-ERs) enhance the development of science teachers' professional knowledge and practice. These methods can provide oppurtunities for science teacher preparation programmes as well as for teachers' professional development.
7.	Barnett and Hodson (2000)	In-service secondary teachers	The study provided a framework for coding the statements made by teachers during their teaching that seem to reflect the various categories coming under 'pedagogical content/context knowledge (PCK)'. Such a coding scheme can also be used in the pre-service teacher education programmes for incorporating this component within teachers' knowledge base, or at least to initiate a process of reflection in this area. It can even be used in assessment or grading with respect to achievement and level of expertise in PCK.

8.	Anderson and Mitchener (1994)		PCK can serve as an alternative framework to view teacher education courses for science teachers' preparation. PCK also serves an epistemological basis for connecting the two distinct spheres of teachers' knowledge base i.e., content and pedagogy.
9.	Veal and Makinster (1999)		Conducted a review of studies related to PCK as well as different models and attributes of PCK added and researched by various educationists and curriculum developers in order to come up with a broader understanding of the concept. A hierarchy was thus developed encompassing different terminologies used for PCK till now in the recent researches such as generic PCK, domain-specific PCK, topic-specific PCK, etc. that led to generation of taxonomy of PCK. Such an approach of categorising PCK and developing a separate taxonomy serve as a basis for laying down the foundation of development of PCK amongst pre-service teachers in various teacher education programmes and thus help a great deal in the professional development of teachers.

The above mentioned studies are specifically related to teachers' professional development as well as teaching efficacy via PCK. All these studies highlight the exhorting role that PCK can play in the development of an expert teacher. The studies also provide a rationale for the incorporation of this component of PCK in pre-service teacher education curriculum as well as in-service training programmes as PCK is not declarative form of knowledge rather a propositional and reflective form that cannot be developed just by introducing this component at pre-service level rather the teachers need to be constantly engaged and equipped with this form of knowledge by means of intervention programmes taking care of different attributes and categories within PCK, of which knowledge about students' ways

of understanding and misconceptions as well as culture-specific and context-specific pedagogical strategies are most important. Thus, calling for a life-long learning programme for teacher development and learning.

The system of education and education as a whole has undergone a massive change in recent years. This can be attributed to a whole lot of factors such as changing socio-political milieu, changing educational policies, changing curriculum, changing patterns of assessment and evaluation, public-private partnership in educational sector, and globalisation and its impact in changing the face of education.

All these factors play an important role in shaping our classroom education knowingly or unknowingly. But are our teachers, who happen to be the major stakeholders and transmitters of this educational change aware or serious about it and if yes then what are their pedagogical approaches in the classrooms to cater to such a change. In the literature review section we have seen how PCK impacts and enhances the teaching efficacy of teachers, therefore our contention in this paper is can PCK in any way guide the teachers in sailing through this change more so in corroborating this change within their classroom teaching. In the light of this vision, we carried out a study in order to understand the role of teachers' knowledge in bringing about pedagogical transformation with respect to changing educational scenario.

The Study Design

In order to cater to the present objectives of this study the researcher undertook a survey design method wherein a questionnaire was constructed in order to gauge the perceptions of our teachers about the prevailing educational change, their respective roles in dealing with it as well as the need to adopt it and integrate it in their teaching. The questionnaire was pilot tested and then distributed to 43 teachers having 0-13 years of experience and enrolled in a masters' degree programme in education (M. Ed). The responses gathered from the questionnaires were then content analysed based on the pre-determined themes for our present study which were as follows:

1. Perception of teachers about teaching as a challenging profession
2. Role of the teacher in this changing state of affairs
3. Status of present Teacher Education Programme (TEP)
4. Sharing experience of an effective pedagogy complying with the changing educational world

5. Impact of context on Pedagogy
6. Impact of any one global or educational change on classroom teaching

Insights from the field study—RESULTS

The responses that were gathered from the teachers using the questionnaire that had six major themes can be arranged as follows.

Perception of Teachers about Teaching as a Challenging Profession

Most of the teachers find teaching as a challenging profession in terms of catering to the different needs of different individuals, inclusion, curriculum load on the teachers as well as students, upcoming policies in education that change the shape and pace of education every now and then. Adapting their teaching to varied pedagogy and altering the same depending upon the topic at hand was also seen as challenging due to the burden of non-teaching tasks that the teachers are endowed with resulting in lesser and lesser time for worthwhile teaching. Diversity in the classroom and adapting to newer technology used in teaching-learning are some other challenges attached to the teaching profession.

Role of the Teacher in this Changing State of Affairs

Teachers have always been treated as passive beings in school as they do not have a say in some of the major decisions related to their own teaching and education in general, for example, curriculum to be followed, textbook to be referred, pedagogy to be adopted in the classroom, etc. But, on the other hand it is the responsibility of the teacher to make the learners aware about the changing world and equipping them in this regard. Some of the arguments given by the teachers in this regard were, educating the learners about conservation of resources, taking examples from day-to-day life for making learning context specific. Teachers are perceived as facilitators in the learning process rather than a mere translator of knowledge due to the increase in awareness level of learners which makes it important to share students' views and opinions.

Status of Present Teacher Education Programme (TEP)

Most of the teachers hold the opinion that the present teacher education programmes have a negligible share in enabling them foresee and adapt to the changing education demand of the world.

The present TEPs are more focussed on pedagogy and have a narrow subject specific approach rather than viewing things by keeping them in a backdrop of themes and issues such as globalisation, public-private partnerships, socio-political conundrums, and economy and state policies. However, another group of teachers are in favour of saying that the present TEP have taken some very good initiatives such as by including latest researches, sensitising the learners toward learning differences amongst students, gender schooling, curriculum development, etc. The rest of them feel that the present TEP need to be revised and revitalised in the light of the present educational demands of the country, for which technology should be made an important component of TEP.

Sharing Experience of an Effective Pedagogy Complying with the Changing Educational World

Here some of the teachers shared their classroom experiences as a learner or as a teacher wherein the pedagogy adopted was clearly linked to the changing world circumstances or aided in understanding them better. Some examples include teaching the concept of 'Banking' by planning a field study to a local nearby bank where the students can learn about the processes and transactions going on in the bank; certain human values have also been a focus of classroom learning such as 'responsible citizenry' that was taught by taking the students to an orphanage where they donated their old books and clothes; conservation of water as a resource has been a major issue of concern these days due to depleting water table, this was raised in one of the classroom by telling a story to students, whose major theme was conservation of water. A set of three unconventional responses gathered from the teachers wherein they have devised an innovative pedagogy to deal with the changing world demands, such as:

1. *A play on "Bishop's Candlesticks" to teach students the qualities of a good human being:* here the teacher noticed the change that the world is facing today in terms of commercialisation and materialistic bent of mind resulting in an attitude of instant gratification. Thus, the teacher writes, "while teaching language my focus will be on choosing such topics to discuss that enable children to be sensitive and develop qualities of patience, for instance, the play, "Bishop's Candlesticks", I would discuss the qualities of the Bishop and encourage students to like him-generous, caring, pious, and compassionate. I would elaborate

upon the fact that the way Bishop changed the convict's nature, ideology by being good to him and accepting him with his faults, each one of us can achieve the same and by developing these qualities. In the play students will see two contrasting characters—the Bishop and the Convict. The Bishop's character redeemed the convict and that is what students will be asked to emulate in their own lives too."

2. *Safety for Women:* these days the issue has taken a furore and needs to be discussed and debated for the rights and security of women. Hence, the teacher writes, "while teaching this in the classroom, I need to analyse and discuss the ways women are biased against, be at home or at workplace. Being a woman they are facing discrimination in day-to-day life. Group discussions and newspaper clippings and sharing own experiences can be organised before coming to the ways to resolve the issue."
3. *Changing weather patterns and pollution:* the change perceived by the teacher in this case pertains to the environmental change due to the evolution of gases in the atmosphere which are harmful and cause disequilibrium in the nature. The pedagogical approach that the teacher devises for dealing with such a change and explains it, "When in the class while discussing oxidation or combustion of different materials, I make sure that learners know what will be the effects of such reactions. I try making them use minimum reagents and have also asked my school authorities not to use CCl_4 as it causes harm to the humans if inhaled and to the nature if evaporated or heated in large quantity. Thus, my pedagogy has become more sensitive and cautious towards the use and misuse of chemistry in daily life."

Thus, the responses gathered under the above mentioned theme indicate to some extent that only few teachers were able to diagnose some of the worldly changes, such as declining morals and values with respect to citizenship and as a good human being, depleting natural resources such as water and changing weather and environmental pattern such as global warming and increasing pollution. The pedagogical intervention devised by the teachers to deal with these changes also seems to be appropriate and innovative too. But, there is a greater need to understand some of the broader educational changes such as technology and its impact on education, impact of globalisation and public-private partnerships in education, incorporation of latest researches in science and technology, dealing

with inclusion in the classrooms and making education learner-friendly with the help of study modules that adapt to the changing needs of the learners to name a few. Thus, there emerges a need to orient our teachers in this direction and to broaden their horizon so as to make them think beyond their subject-specific boundaries.

Impact of Context on Pedagogy

There could be many factors that impinge upon the pedagogy to be adopted in the classroom. Some of them were enumerated by the teachers as school infrastructure, classroom culture and environment, govt. education policies, coaching classes, internet, changing schemes of evaluation such as CCE (Continuous Comprehensive Evaluation). Most of the teachers felt so much over burdened with the administerial tasks being given to them that they seldom had time and energy left to think about the pedagogy. This clearly depicts that pedagogy is being sidelined in most of the classrooms. But some of them do feel that pedagogy should take into account the context such as the urban or rural setup and cite examples accordingly. Technology seemed to be one of the most overwhelming factors that have the ability to transform classroom teaching-learning and as noted by the teachers' aids in framing effective pedagogy.

Example of Impact of Any one Global or Educational Change on Classroom Teaching

Here some of the **anecdotes from teachers' responses** can be quoted as follows.

1. "Inclusion in education system for catering to the needs of specially able children. Teachers should design such activities that do not hurt the differently abled learners psychologically or socially."
2. "No Detention Policy impacts the education system adversely by deteriorating the quality of education. This can be handled by teachers in ways that learning is of interest to the students and is for the sake of learning and not attainment of grades or marks."
3. "Inclusion has its impact on both teaching and learning. Teachers need to be aware about the various learning difficulties and help the learners in overcoming them by providing them extra time, individual attention, care and designing some special tasks for

these learners so as to hone their skills, and make them feel comfortable. Here the parents can also be involved and their support can be sought."

4. "The adoption of some of the new policies such as 'No Detention Policy' and CCE has made the learners adhere to a laid back attitude toward their studies, they do not want to do their efforts and work hard. This is leading to an increasing disinterest amongst the learners. This 'educational change' can be handled only by way of interesting pedagogy whereby the learner develops a joy for learning, which can be done by using AV aids, projectors, educational movies and documentaries."
5. "Use of technology in education which can be integrated within the teaching of each and every subject, for example, in English teaching different skills can be taught and mastered such as writing, listening, grammar, pronunciation, meaning-making, etc."

The anecdotes gathered from teachers' responses appear somewhat more like a suggestion and less of an action. It seems that teachers are aware of the different policies and schemes adopted by their schools but do not find themselves in the partaking role, as a result of which they are able to empathise with the plight of differently abled learners but feel the handicap of dealing with this change head-on. Similarly with the 'No Detention' scheme the teachers share their grievances and dissatisfaction and are able to devise suitable strategies to curb the laid-back attitude of some learners but only few were able to devise suitable pedagogical measures to face such a contextual change.

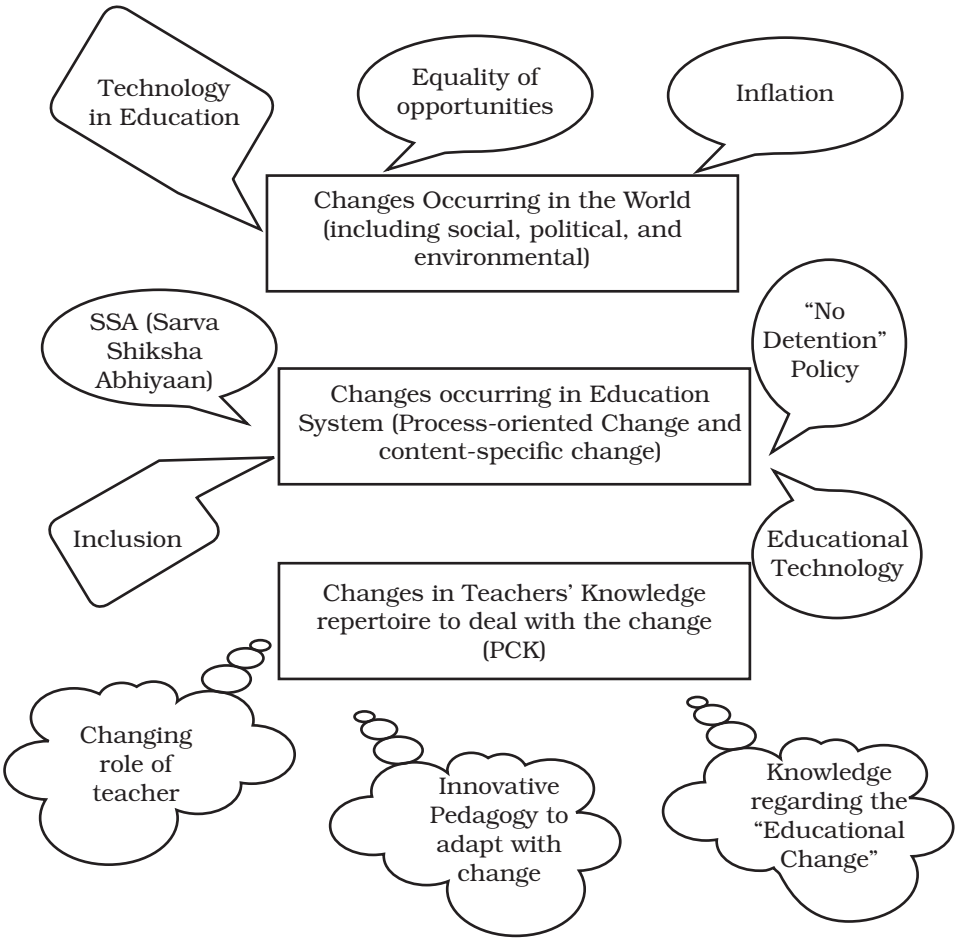
Discussion

The present study provides evidences for the significance of Pedagogical Content Knowledge in the area of educational change, its impact and fallout on classroom pedagogy. The teachers were able to identify some of the educational changes such as those related to changing milieu of socio-political changes like changing values, materialistic bent of mind, declining safety for women, environmental changes such as global warming and depletion of natural resources and biodiversity, changing governmental policies including 'No detention policy', 'Inclusive Education', etc., but only few were able to devise suitable pedagogy for overcoming

and adapting to the change. But, as it appears the teachers have a limited repertoire of knowledge of linking their teaching to some of the broader educational changes and changing world that will include issues such as working towards scientific literacy, humanistic education, bracing oneself with the latest technology and devising learning modules for students, educating the young to contribute to a social cause, and an integrated approach towards education. The data suggests that only some teachers have an effective pedagogical expertise to integrate the changing educational trends within the teaching of their respective subjects and have been cited in their pedagogical anecdotes.

Such a mixed response from the teachers' side indicates that such issues are not being raised usually in any of the teacher education programmes that they have gone through as the one unanimous response that we gathered was that "TEPs only guide partially in equipping the teachers to deal with any kind of educational change." Therefore, the reason behind some of the teachers being able to perceive any educational change and integrating the same in their class-room teaching can be attributed to their personal teaching efficacy and perception with respect to educational change.

Thus, the reflection is on the present day teacher education programmes running in our country that fail to equip our teachers in this regard as almost all the teachers in our sample have pointed out. But, the question arises as to where to include this component; this has to come both at the theory as well as practical level. This can be done by including it within the teaching of a particular subject that is to say at the level of Pedagogical Content knowledge only then can this educational change will be transacted effectively in the classroom. Hence, re-establishing the importance of PCK in bringing about change and innovation in teaching-learning. PCK can also be used as a means to understand teachers' knowledge in any of these areas and incorporated and extrapolated to similar situations. Since context impacts PCK therefore, the different correlates of context have a direct bearing upon the PCK adopted by a teacher in a classroom which need to be further researched upon. Since PCK is said to have a transformative role on teaching as well as teacher education, therefore its need cannot be re-emphasised in the present teacher education programme. The following flowchart will help in understanding the course and structure of this change.



Conclusion

The objective of writing the present paper is emphasising the importance of Pedagogical Content Knowledge (PCK) in guiding teachers through the process of educational change that the world has faced in the present century and transacting the same by way of their classroom teaching. However, the present study is just a beginning step to understand the conceptions our teachers hold about the changing educational scenario, and to our surprise we have discovered that not many teachers are aware about these educational changes and have been confined to their subject related boundaries only. This has generated an even greater concern for

educating the prospective teachers about these educational changes that the world has been going through for which PCK can act as a means to achieve a higher aim of adapting young teachers face such challenges. PCK as a construct is now a well known concept in the sphere of professional development of teachers in equipping them toward effective teaching as the literature also provides evidence. So, why can't PCK act as a road map to facilitate and adapt both the teachers and the learners for any kind of worldly change. For this to become a reality, many more researches focusing upon the PCK of different teachers dealing with such educational changes in their classroom have to be gauged, and for which we need to have such teachers. Thus, the seed has to be sown at the most initial level of teacher education programme.

The following are some of the **Educational Implications** that have been derived from the present study.

1. Teachers to be made aware about the global changes that the world as a whole is facing and boiling them down at the level of education.
2. Teacher education programmes (TEPs) need to be situated within the broader framework of the educational changes specifically related to a particular country.
3. TEPs should provide a link between imagery and real, often the teachers when moving out from a TEP are not able to perceive or handle the educational demands of the learners, school and society. This leads to tensions in the minds of both the teacher and administrator.
4. PCK as a component should be integrated within the TEP and especially in the context of tackling the educational changes.
5. TEPs need to have a relook at the curriculum that they propose and should strive toward including this component of educational change and the factors contributing for it within them.

Suggestions for Further Research

The present study is just an initiation toward the cause of educational change via teacher education route, but many more studies are required to gain an in-depth understanding in this area. The following are some suggestions for future researches within this area.

- Understanding educational change in different contexts and its reflection in classroom processes.

- Studying the impact of PCK in developing effective strategies for dealing with educational changes.

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Influence of Gender, Management and Locality of Schools on the Thinking Styles of Secondary School Students in Kerala

P. Ramakrishnan* and C. Naseema**

Abstract

The influence of gender, management category of schools and locality of schools on the thinking styles as defined by the mental self government theory of Sternberg (1997) was studied. A Thinking Styles Test Battery (TSTB) was developed and administered among 486 secondary school students (228 boys and 258 girls) studying in 9th standard randomly selected from 13 schools among six districts in Kerala State. It was found that gender is influencing internal, liberal and conservative thinking styles. Boys are found to be highly internal and liberal than girls and girls are high in their conservative thinking style characteristics. It was also revealed that management category of the student's schools is also influencing some thinking styles. Students studying in aided schools are significantly high in their monarchic, hierarchic and internal thinking styles whereas students studying in government schools are high in their executive thinking styles. Locality of the schools is also found to be influencing the thinking styles of students. Urban pupils have significantly high legislative thinking style and rural pupil have significantly high judicial and monarchic thinking styles.

Introduction

Individual difference in human performance is an important area of interest in behavioral science. Intelligence, personality etc. are some of the constructs developed for explaining individual differences. When they gave only a partial answer to the question of individual differences in performance, some interfaces between

* *Lecturer*, District Institute of Education and Training (DIET), Thrissur, Ramavarmapuram PO, Kerala.

** *Professor of Education*, University of Calicut, Calicut University PO, Kerala.

these constructs were developed. The notion of styles developed after 1950's is one among the attempts to describe individual differences using some interfaces between intelligence and personality (Sternberg, 1997; Sternberg and Zhang, 2001). Generally, styles are classified as cognitive styles, learning styles and thinking styles (Sternberg and Zhang, 2009). Cognitive styles are the ways of organising information. Learning styles are about the ways of learning something and thinking styles describe how one prefers to think.

Our abilities do not completely explain our performance in different situations. Individuals with equal abilities need not necessarily perform similarly in a given situation. These differences are due to the variation in using the abilities one possesses. People like to use their abilities in different ways in different situations. Thinking styles are the preferred way of using abilities (Sternberg, 1997).While abilities describe what one can do, thinking styles shows how one likes to use the abilities. Sternberg, in his theory (mental self government theory of thinking styles), postulated a profile of 13 dimensions of thinking styles under five categories. Like the organisation of governments in modern human society, according to this theory, individual's mental self government of thinking styles also has some functions (legislative, judicial and executive), forms (monarchic, hierarchic, oligarchic and anarchic), levels (global and local),scope (internal and external) and leanings (liberal and conservative).

People with legislative thinking style prefer to create, design and invent things. Judging, evaluating and analysing of things and processes are the preferences of judicial people. Executives follow and obey rules and regulations and implement things and procedures developed by others. Monarchic individuals have one goal at a given time and devote fully for its attainment disregarding the obstacles. Both hierarchic and oligarchic people have more than one goal at a time. A hierarchic person, realising the impossibility of achieving all goals at a time, prioritise their goals and strives for the attainment of the goals in the order of priority; but the oligarchic people attend all their goals at a time without any prioritisation. Anarchic individuals have a large number of attainable and unattainable goals and attempts to achieve all of them without any order or regularity. While global person sees the whole picture and abstractness of the things and problems, local people generally sees the details, specifics and concrete matters. People with internal thinking style

are work oriented and prefer do things alone. But external people are more people oriented and outgoing with preferences for working with others. Liberal people prefer change. They seek unfamiliar situations and defy conventions. Whereas conservative people like to follow conventions and avoid unfamiliar situations.

No styles are good or bad. We possess all styles and difference is in degrees and not in type. We do not have a single style, but a profile of styles of different dimensions in varying degrees at a given period of time. This may change with the changes in the tasks, situations and groups with which one is engaged. Thinking style of an individual changes also with time, age and experience. Thinking styles are sociable and hence learnable. They can be developed by practice. It is a broad intellectual construct and applies to both academic and non academic settings.

The profile of 13 dimensions of thinking styles was grouped in to three types (Zhang and Sternberg 2005, 2006). Type I thinking styles are the ones that tend to be more creativity generating and that denote higher levels of cognitive complexity, including the legislative (being creative), judicial (evaluative of other people and products), hierarchical (prioritising one's tasks), global (focusing on the holistic picture), and liberal (taking a new approach to tasks) styles. Type II thinking styles are styles that suggest a norm-favouring tendency and that denote lower levels of cognitive complexity, including the executive (implementing tasks with given orders), local (focusing on details), monarchic (working on one task at a time), and conservative (using traditional approach to tasks) styles. The anarchic (working on whatever task that comes along), oligarchic (working on multiple tasks without priority), internal (working on one's own), and external (working with others) styles are Type III styles. They may manifest the characteristics of the styles from Type I and Type II groups, depending on the stylistic demands of a specific task. (www.elsevier.com)

Influence of gender, age, SES and other demographic variables on thinking styles among different group of subjects was repeatedly proved in the reviewed studies. But the literature doesn't provide a uniform picture on the existence of a particular style or a profile of styles among peoples with particular demographic variables. They rather present mixed result about the influence of different demographic variables on thinking styles. Reviewed studies provided different results about the influence of various demographic variables such as gender, institution type and locality on thinking styles. The questions like whether gender is influencing thinking

styles, whether boys and girls differ significantly in their thinking styles, which institutional group is good/bad for different dimensions of thinking styles, whether the locality of institutions are influencing the thinking styles of students studying in these institutions are needed to be explored further and answered clearly. The present study is an attempt in this direction. It tries to measure the thinking styles of secondary school pupils in the state and to analyse the influence of gender, management category of schools and locality of schools on the thinking styles of secondary school students.

Further, many academic problems faced by the students in Indian context are not satisfactorily explained by the constructs of abilities or intelligence. There are literally as many ways of thinking as there are people in the world. Students come to the classrooms with a lot of creative ideas. But they are forced and learn to hide or suppress their creative ideas. Sometimes it makes so many punishments to make the children do what they are told to do. Those who are not learned to suppress are considered as having behaviour problems, annoyances or even anti-social. It is not possible for the teacher in the present system even to tolerate them though not appreciate their creativity. Teaching and learning process in our classrooms mostly depends on remembrance of facts and figures in the order given in the textbooks. Few pupils with certain thinking preferences get advantage out of this and others are considered as dull. Undue importance is given to verbal factors as teaching and learning is considered only as lecturing and note taking. Those with other thinking style preferences suffer and are thrown out of the process. Teachers almost invariably teach and assess students in ways that benefit those with certain styles of thinking and learning but place many others at marked disadvantage. Schools and other institutions value certain ways of thinking than others. People whose ways of thinking do not match those valued by the institutions are usually penalised. So, the investigator felt that it is a need to analyse the thinking styles of secondary school pupils of Kerala state in India and find out whether gender, management category of schools or locality of schools are influencing their thinking styles.

Review of Literature

Cillers (2001) found significant gender difference only in one out of thirteen thinking styles; females showed significantly stronger preference for executive thinking style. But a large number of studies indicated the influence of different demographic variables such as

sex, age, SES etc. on thinking styles. Sternberg and Gregorenko (1995) indicated significant relationship between students learning styles and such demographic data as students SES and birth order. Participants with higher SES tended to score high on legislative style and less judicial. Participants who were later-born in their families scored higher on the legislative style than the earlier-born. Students tend to match their teachers though not their school in style. Verma (2001) noted that female college students have greater inclination towards the use of legislative and executive thinking styles where as male students had tendency to adopt monarchic thinking styles. Rural urban differences on thinking styles are almost negligible. Zhang and Sachs (1997) found that male students scored significantly higher in global thinking styles. Results of a study conducted by Zhang and Sternberg (1998) suggested that students' thinking styles are statistically different based on such variables as age, sex, college class, teaching experience, college major, school subject taught, and travel experience. Male participants scored higher on global thinking styles than did their female counterparts. Participants who had had more teaching experience and those who had had more travel experience scored higher on the creativity promoting thinking styles such as legislative and liberal. Zhang (2000) reported that the social and enterprising type of people tended to use the external thinking style, but not the internal thinking style. The artistic type of people tended not to use thinking styles that require conformity. Verma and Monica (2006) found that gender had significant influence on Executive, anarchic and external thinking styles.

Gregorenko and Sternberg (1997) found that certain thinking styles contribute significantly to the prediction of academic performance over and above prediction of scores on ability tests and Zhicheng and Stephen (1997) substantiated Sternberg's claim that styles contribute to achievement beyond what can be expected by students' intelligence Zabukovec and Kobal-Grum (1994) recommended educational process which enhances different thinking styles for the development of more flexible problem solving. Knowledge of the pattern of thinking styles among different sex, age, locality, subject and institutional groups will help in planning the development of these thinking styles among the respected groups. Development of the required thinking style dimensions in required groups is supposed to make the educational practice more effective for them.

The presence of thinking styles and the influence of sex, age, SES and other demographic variables on thinking styles among different group of subjects were repeatedly proved in the reviewed studies. But the literature doesn't provide a uniform picture on the existence of a particular style or a profile of styles in a particular group of subjects. They also present only rather mixed result about the influence of different demographic variables on thinking styles.

Objective of the Study

1. To test whether significant difference exist between the mean thinking style scores of boys and girls studying in the secondary schools in Kerala state.
2. To test whether significant difference exist between the mean thinking style scores of secondary school students studying in government and aided schools in Kerala state.
3. To test whether significant difference exist between the mean thinking style scores of secondary school students studying in the schools situated in rural and urban areas in Kerala state.

Methodology

Tools Used

The study was conducted by administering the Thinking Styles Test Battery (TSTB) (Naseema and Ramakrishnan, 2006) and a General Data Sheet designed for the purpose.

Thinking Styles Test Battery (TSTB) was designed, developed and standardised for the measurement of thinking styles of secondary school pupils in Kerala state. It was developed on the basis of the mental self government theory of thinking styles by Sternberg (1997). TSTB contains a battery of four tests designed for group administration. Test I measures the legislative, judicial and executive thinking styles. Test II measures the monarchic, hierarchic, oligarchic, anarchic, internal and external thinking styles. Test III measures the global and local thinking styles and Test IV liberal and conservative styles.

Sample

The study was conducted on a sample of 486 secondary school students studying in IXth standard randomly selected from 13 schools among six districts in Kerala State. The sample consists 228 boys and 258 girls. It includes 325 students from government schools,

161 from aided schools, 265 from urban area and 221 students from schools situated in rural areas. Among the total, 105 samples are from Kasaragode district, 87 samples are from Malappuram district, 83 samples are from Trissur district, 62 samples are from Kottayam district, 73 samples are from Alappuzha district and 76 samples are from Thiruvananthapuram district. Data from a total of 486 secondary school pupils all studying in co-educational schools were used for the present study.

Collection of Data

Thinking styles of respondents were measured by calculating the level of thinking style characteristics present among them. For this purpose, Thinking Styles Test Battery (TSTB) was administered among the selected sample by the investigator. Students possessing high levels of various dimensions of thinking styles were calculated for the whole sample and the subsamples based on gender, management category of schools and locality of schools. Results are given in Table 1.

Table 1: Percentage of Students Possessing High Levels of Thinking Styles

Thinking Styles		Percentage of Students						
		Whole sample	Boys	Girls	Govt.	Aided	Urban	Rural
	N	**486**	**228**	**258**	**325**	**161**	**265**	**221**
Legislative		54.7	56.6	53.1	54.5	55.3	59.2	63.8
Judicial		55.8	55.7	55.8	54.8	57.8	53.2	58.8
Executive		57.6	57.0	58.1	60.0	52.8	53.2	62.9
Monarchic		52.5	53.5	47.7	61.5	50.9	57.4	59.3
Hierarchic		56.8	51.3	53.5	54.2	50.3	52.5	52.9
Oligarchic		53.9	55.3	52.7	51.1	59.6	54.7	52.9
Anarchic		55.1	54.0	56.2	54.1	50.3	53.2	57.5
Internal		55.3	55.3	57.8	56.6	55.3	50.2	54.8
External		51.4	57.9	53.5	52.3	55.3	50.6	52.5
Global		52.9	63.6	56.6	56.0	64.6	52.8	52.9
Local		56.0	50.0	53.5	54.8	51.6	55.5	56.6
Liberal		63.6	57.9	58.1	63.4	53.4	52.5	60.6
Conservative		62.8	55.7	56.6	51.1	59.6	63.4	50.7

On the basis of the percentage of students possessing high level of various dimensions of thinking styles, it was revealed that

54.7 percentage of the students are legislative, 55.8 percentage judicial, 57.6 percentage executive, 52.5 percentage monarchic, 56.8 percentage hierarchic, 53.9 percentage oligarchic, 55.1 percentage anarchic, 55.3 percentage internal, 51.4 percentage external, 52.9 percentage global, 56.0 percentage local, 63.6 percentage liberal and 62.8 percentage conservative. The percentage of students possessing the characteristics of various dimensions of thinking styles among the subsamples based on gender, management category of schools, and locality of schools are also similar with the presence of these characteristics among the total sample. Primarily, it shows the existence of various thinking style characteristics among the secondary school students in Kerala.

Statistical Techniques

Using computer software, the entered data were classified into various groups and sub-groups; measures of central tendencies, dispersions and percentages were estimated and subjected to necessary statistical tests. Mean scores of thinking styles were compared between the subsamples of boys and girls, between government and aided school students and between urban and rural school students using the test of significance of difference between mean for large independent sample. CRs were interpreted using the two tailed test of significance.

Results and Discussions

Results of the test of significance of difference between mean thinking style scores among subsamples based on gender, management type and locality are given in Table 2.

Discussion

Test of significance of difference between the mean thinking style scores of boys and girls revealed that boys are significantly highly internal (0.05 level) and highly liberal (0.01 level) than girls whereas girls are significantly highly conservative than boys. Individuals with internal thinking style are aloof; work oriented and prefers to do things individually. So, it may be concluded that boys are more inward and work oriented than girls. As boys are also found to be significantly more liberal than girls, they prefers to overtake conventions, seek new and challenging situations more than girls as these are the characteristics liberal thinking style. Characteristics of conservative people are that they like existing rules and procedures, familiar situations and dislike change. As girls show conservative

thinking style tendencies than boys, it is concluded that girls tries to avoid changes, ambiguous situations and adhere to existing rules and procedures than boys.

Table 2: Summary of the Test of Significance of Difference between Mean Thinking Style Scores among Subsamples

Thinking Styles	Mean and Critical Ratio								
	Between Boys and Girls			Between Govt. and Aided			Between Rural and Urban		
	M_1	M_2	CR	M_1	M_2	CR	M_1	M_2	CR
Legislative	10.80	10.89	0.333	10.78	10.98	0.672	11.14	10.50	2.282*
Judicial	9.89	9.71	0.806	9.66	10.07	1.779	09.58	10.05	2.179*
Executive	9.20	9.34	0.486	9.50	8.83	2.235*	09.20	9.36	0.588
Monarchic	19.13	18.68	0.988	18.42	19.84	2.935**	18.40	19.48	2.447*
Hierarchic	20.65	19.93	1.469	19.84	21.13	2.239*	19.88	20.73	1.796
Oligarchic	18.08	17.93	0.376	17.89	18.24	0.846	17.87	18.16	0.742
Anarchic	16.02	16.67	1.537	16.19	16.73	1.134	16.05	16.75	1.645
Internal	16.01	15.13	2.146*	15.05	16.55	3.239**	15.27	15.87	1.463
External	20.98	21.19	0.525	21.25	20.78	1.023	21.02	21.18	0.415
Global	15.97	16.40	1.208	16.24	16.12	0.294	16.13	16.28	0.429
Local	13.77	13.44	0.971	13.63	13.52	0.314	13.70	13.47	0.682
Liberal	13.09	12.03	3.610**	12.43	12.72	0.926	12.71	12.31	1.352
Conservative	16.66	17.74	3.620**	17.33	17.05	0.899	17.13	17.37	0.790

*** indicates significance at 0.01 level * indicates significance at 0.05 level*

It was also found that government school students are significantly (0.05 level) more executive than the aided school students. So, it is derived that government school students prefers to obey directions, like pre structured and pre fabricated problems and follow rules (characteristics of executive thinking style) than aided school students. Aided school students are significantly more monarchic (0.01 level), hierarchic (0.05 level) and internal (0.01 level) than the government school students. It indicates aided school students prefer to do one work at a given time and concentrate their maximum attention on its completion before beginning another work (characteristics of monarchic thinking style), recognises the need to prioritise their goals and works at a given time (characteristics of hierarchic thinking style) and more aloof and work oriented (characteristics of internal thinking style) than government school students.

When the mean thinking style scores of urban and rural school students compared, urban school pupils were found to be significantly (0.01 level) highly legislative than rural school students. So, the urban school students prefer to come up with their own ideas, take decisions for themselves and create their own rules than rural school students (characteristics of legislative thinking style). Rural school students are highly judicial (0.05 level) and monarchic (0.01 level) than urban school students. It shows rural school students prefers judgment and evaluation of things and events and analysis of problems (characteristics of judicial thinking style) and entertain one goal at a time with maximum effort before attempting another (characteristics of monarchic thinking style) than their urban counterparts.

Results of the study indicate that gender is influencing internal, liberal and conservative thinking styles. Boys are found to be highly internal and liberal than girls and girls are high in their conservative thinking style characteristics. Though Cillers (2001) reported significant gender difference only in one out of thirteen thinking styles (where females showed significantly stronger preference for executive thinking style), the findings of the present study substantiate the findings of the previous studies (Verma, 2001; Zhang and Sachs, 1997; Zhang and Sternberg, 1998 and Verma and Monica, 2006) which indicated a significant influence of sex on different thinking styles.

Principles of growth and development indicate variation in the pattern of development among boys and girls during the period of early adolescence in which girls overtake boys both physically and mentally. Lag in the developmental advancement and resultant adolescence awkwardness of boys may be the reason for their significantly high internal thinking styles which is mainly characterised by the loneliness and the tendency to work alone. Teaching learning activities in the classrooms may help all the students develop their individual skills and group skills because both are basic life skills which are necessary for the successful participation in modern society. As boys are found to be more focused towards individual skills (like working alone) comparing the girls, necessary changes in the approaches may be made to develop all major life skills in all groups of students.

The conventional social beliefs and restrictions may prevent the girls from more social opportunities. This factor may be reflected

in the high conventional thinking style scores of girls which are characterised by the tendency to stick to existing rules and procedures and familiar situations and the dislike for changes. Over domination of conservative thinking style may not be helpful for catering to the changing needs of the modern life of our future citizens. So the factors leading to the concentration of conservative thinking style in girls may be analysed further and necessary remedial measures may be adopted for equipping the girls for a better and practical future life.

It was also found from the study that management category of the student's schools is also influencing some thinking styles. Students studying in aided schools are significantly high in their monarchic, hierarchic and internal thinking styles whereas students studying in government schools are high in their executive thinking styles. This finding substantiates the results of the study conducted by Zhang and Sternberg (1998) in which thinking styles are statistically different based on such variables as college class, experience and school subject.

Differences between government and aided schools in Kerala in their management, administration, infrastructure facilities, availability of developmental funds, appointment of teachers, availability of permanent team of teaching staff and organisation of systematic curricular and co-curricular activities may have resulted in the thinking styles of students studying in these schools. Since government and aided schools are following the same curriculum, syllabus and teaching-learning approaches and are functioning under the same department, necessary provisions may be made to avoid any difference between their functioning.

Locality of the schools is also found to be influencing thinking styles. Urban pupils have significantly high legislative thinking style and rural pupil have significantly high judicial and monarchic thinking styles. Exposure to modern standards of living facilitated by better transportation, communication and other advanced technological facilities may have helped pupils studying in urban schools to have high legislative thinking style which is the preference for their own ideas and their own ways for getting things done. The rural life, on the other hand, is not able to involve actively in the modern ways of living. They still remain mere spectators to the vast advancing world outside. This situation may be reflected in the high judicial thinking style of rural school pupils which is the tendency to judge and evaluate people, things and events.

Conclusions

From the results of the study, it may be concluded that gender is influencing internal, liberal and conservative thinking styles. Boys are found to be highly internal and liberal than girls and girls are high in their conservative thinking style characteristics. It was also concluded that management category of the student's schools is also influencing some thinking styles. Students studying in aided schools are significantly high in their monarchic, hierarchic and internal thinking styles whereas students studying in government schools are high in their executive thinking styles. It may also be concluded that locality of the schools is influencing the thinking styles of students. Urban pupils have significantly high legislative thinking style and rural pupil have significantly high judicial and monarchic thinking styles.

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Research Innovation

Effective Intervention to Enhance Understanding in Mathematics—Report of a Successful Experiment

Lalitha Ganeshan*

Abstract

Teaching the first year undergraduate students, the foundations of mathematics, is a challenge and could be quite unnerving to a novice. The first few lectures in the First Year B. Sc. class are very crucial and the way in which one handles this will set the tone for the whole year. There are several reasons for this: the fall in enrollment for pure sciences including Mathematics resulting in the poor quality of students opting for Mathematics, their differing needs, and the disparate levels of language skills and mathematical capabilities. But a good number of these students end up teaching Science/ Mathematics in high school / higher secondary school and some of them do post graduation and teach in undergraduate colleges and engineering colleges too. So it is imperative that we target this group and try and motivate them, and teach them. Mathematics in a more effective manner. This is a report of a successful intervention since June 2006, using certain strategies to tackle these issues and enhance Mathematics learning, and the understanding of average learners of Mathematics.

Introduction

Origin of the Research Problem

Teaching the first year undergraduate students, the foundations of Mathematics, is quite a challenge and could be quite unnerving to the uninitiated. Many of the students are very disillusioned as they have not made it to professional courses like engineering, medicine or even the courses like B.Sc. IT or Computer Science because of poor scores in the examinations or for lack of funds or both.

* *Head*, Department of Mathematics, Jai Hind College, 'A' Road, Churchgate, Mumbai.

There is a major shift in emphasis from pre-college Mathematics to Undergraduate Mathematics, especially in subjects like Algebra, Real Analysis and Topology. The nature of the subject being what it is, it requires application, hard work and a certain level of mathematical maturity—the maturity to understand and articulate mathematical ideas and learn methods not only of problem-solving but of writing mathematical proofs. In the first year B.Sc. course around 120 - 150 students are admitted in the Physics- Mathematics- Chemistry and Physics–Mathematics-Computer Science subject combinations in our college. By the end of the first semester, more than 50 per cent of the students leave for Engineering, Management Studies and other courses. Among those who continue with B.Sc. 25-30 students opt for Mathematics as one of their subjects in the second year B. Sc; we are trying to teach such a group of students, principles of cardinality, countability, the infinite and the infinitesimal, and convergence and completeness.

Table I

Year	No. of Students Who Appeared for Mumbai University Final B. Sc Exam in Mathematics	Pass %
2001	1200	73
2010	800	55

The dwindling numbers and poor quality of students opting to major in Mathematics, their differing needs that derive from their family backgrounds and poor language skills complicate the matter further. In the author's experience as a mathematics teacher and as an examiner for the University Examination for several years, it has been observed that this experience is not unique to our college. 1200 students appeared for the third year University Examination in Mathematics in the year 2001 and 73 per cent of them passed. By 2010, the figures have dropped alarmingly to around 800 with only 55 per cent of them passing (See Table I); it is further seen that more students fail in abstract papers like Algebra or Analysis where they are not able to write a proof or convey ideas with clarity. The **more serious concern here** is that a large number of these students end up teaching Mathematics in high schools, higher secondary schools, undergraduate colleges and engineering colleges. So it is imperative that we target this group and try and motivate them, and teach them Mathematics in a more effective manner.

Epistemological Concerns

The nature of Higher Mathematics is such that to learn Mathematics one needs to have fluency with logic, notation, manipulation of symbols, and the ability to understand and articulate abstract ideas. According to S. G. Krantz, "As the subject develops, so do the skill sets needed to master the new ideas. The techniques needed to learn Calculus and solve problems in Calculus are different from the skills needed to learn abstract algebra, prove theorems about it. ..... Calculus requires problem solving skills and Algebra needs serious logic, axiomatic, set theory, sophisticated ability with proofs, and considerable tenacity. There is a marked qualitative difference in the two skill sets. The latter skill set is what mathematical maturity is all about". He clarifies further "mathematical maturity consists of the ability to handle increasingly abstract ideas, generalise from specific examples to broad concepts, formulate problems, work with analytical, algebraic, and geometrical concepts, and to move from the intuitive to the rigorous". To make this transition, the language proficiency in the medium of instruction (English) and proficiency in Mathematical language are very essential; otherwise it can hinder progress by creating bottlenecks to learning. Communication in Mathematics includes teaching-learning, writing, answering questions in class or examinations, and solving problems and justifying steps. Field medalist William P. Thurston wrote, in his article "On proof and progress in Mathematics", "our linguistic facility is an important tool for thinking, not just for communication. The language that we use reflects the level and the profundity of our thinking."

Pedagogical Concerns

Being good at Mathematics is not enough to teach Mathematics well. To teach Mathematics well, one should be able to conjecture, recognise patterns and generalise, teach students problem solving skills, be tenacious in pursuing problems, find examples to make a precise mathematical point, choose strategic examples and counter-examples, anticipate possible misconceptions, analyse the source of student error and use them to clarify concepts, and teach them the use of mathematical notation and language, and critique its use. The teacher's knowledge of Mathematics is crucial to their capacity to make judgments about planning and organising the content, to use teaching materials effectively, and to dynamically engage students to enhance their learning. The

popular but erroneous notion is that Mathematics teachers merely solve problems. They must explain concepts, theories, listen, justify, evaluate assignments, and assess students' understanding. In short, teachers need skills and knowledge in order to teach effectively. All these tasks involve both mathematical reasoning and pedagogical thinking. According to Hyman Bass, Professor of Mathematics and Mathematics Educator, *the knowledge, practices, and habits of mind of research mathematicians are not only relevant to mathematics education, but that this mathematical sensibility and perspective is essential for maintaining the mathematical balance and integrity of the educational process.*

Given the nature of mathematics, the task of making classroom teaching of mathematics effective and inclusive is indeed a challenge. The author initiated certain intervention since 2005-06 based on demystification approaches, learner centric methods and error analysis with the immediate goal of reversing the downward trend in passing percentage and the larger goal of fostering effective and inclusive teaching in mind.

Intervention

The first year students are a disillusioned lot with muddled understanding of concepts, faulty logic and a lack of communication skills. We are trying to teach such a group of students, abstract concepts and axiomatic. The result could be disastrous. The erosion in the quality, over the years, of students enrolling for Mathematics, had a cascading effect. In 2005, the pass percentage of third tear B. Sc mathematics students touched an all time low of 53 per cent, 9 per cent lower than the universities pass percentage. It called for drastic measures of intervention. The author initiated certain activities based on demystification approaches, reinforcement through drills, math communication skills, and more effective teaching strategies.

Demystification Approach

As part of these efforts, a credit course in Mathematics was initiated in the year 2005-06. A theme was chosen for each year. Some of the themes chosen have been *Numbers, Geometries, A Mathematician of your choice, Cryptography,* and *Infinite Series.* Popular lectures on the theme by experts are organised in the beginning of the year. Then all students, in groups of not more than three, select a topic, with the help of teachers, and submit an assignment which included a bibliography too. Students were

encouraged to give presentations and book reviews. Credits were earned through these assignments, seminars, book reviews, quality contribution to the Math Window magazine and also consistently good academic performance in Mathematics in the examinations in all the three years. The other activities included screening of movies on Mathematics, literary sessions where excerpts from books on Mathematics or Mathematicians are read, audio-visual lectures on topics like Computer animation, the Golden Ratio, attending public lectures on Mathematics and so on. The literary sessions, popular lectures and book reviews were aimed at improving their general language proficiency and to arouse interest in Science and in particular Mathematics.

Mathematics Communication Skills

It is observed in the first year of the B.Sc programme that a majority of the students have been learning mathematics by literally scanning the text like an image or learning by rote. On asking a student to read or write a proof or a definition, the student would halt invariably when notations enter the statement. As a result of the inability to understand the logical connections and/or the inability to comprehend the notation, many students are not able to recall definitions and proofs completely. So the students were given drills in mathematics communication-drills in notation and logic, drills in reading/writing a mathematical statement; their erroneous assumptions and arguments were discussed. Learning takes place at various levels—visual, symbolic, and verbal. So students are given exercises in converting verbal representations to symbolic and vice versa. This exercise continues for a while explicitly and then, in a more subtle way, throughout the three-year degree programme to help them gain understanding and the ability to articulate ideas.

Effective Teaching Strategies

At the next level, more emphasis was laid on learner-centric pedagogies, error analysis, and a problem-solving approach. Engaging students in problem solving (on the board or in groups), discussing their misconceptions and faulty arguments which gives them real time feedback, getting them to recall, precisely, statements of theorems and definitions, asking them to justify a particular step in a proof were all part of these strategies. Conceptual understanding and articulation, and an ability to see the overall picture are also equally important. So, as they gain more mathematical maturity,

the students were asked to rephrase definitions, fill gaps in proofs, negate mathematical statements, write converse of mathematical statements, summarise the various steps in a proof, maintaining journals and so on. By using these strategies, the students were made to think aloud by analysing and vocalising their thoughts which in turn helped them clarify their thought process. In short, they were trained to write mathematics to learn mathematics.

On the other hand, the teaching plans were discussed, and the ideas and practices were systematically examined to improve their effectiveness with the students, by interacting with colleagues and using other resources. Every year while discussing teaching plans for various topics, it was deliberated, for example, whether to teach the proofs of theorems like *the cardinality of a set is strictly less than that of its power set* or *the existence and uniqueness of the determinant function*, for a particular first or second year batch; how best to prove *the interval (0, 1) is uncountable or equivalent to the set of real numbers*. The teaching plans and the techniques were thus calibrated to suit the level of each batch and then efforts were made to raise the bar.

Discussion of Outcomes

A definite qualitative change is seen in the students as they progress from the first year to the third year. This is also reflected in the marks they score. At the entry level, the average marks are approximately 45 per cent and at the third year B.Sc. University examination, around 55-60 per cent of our students score a first class. There is also a marked improvement in the pass percentage. A comparison of the pass percentage of our students and the corresponding figures for the university is given in Table II.

It was possible not only to arrest the downward trend but also to improve the pass percentage far above the overall pass percentage of the university. It has also created the awareness among the faculty the need to create a classroom culture wherein the students feel free to interact, try to solve problems on the board, write journals. This model can be used for effective and inclusive teaching of Mathematics wherein the students are actively participating in the classroom, thereby leading to enhanced understanding of concepts.

Conclusion

The lesson that can be learned from the last six years is that we need to revamp the undergraduate Mathematics Programme in order

Table II

Year	Pass % in Mathematics in	
	University of Mumbai	Jai Hind College
2003-04	68	65
2004-05	64	53
2005-06	62	100
2006-07	51	86
2007-08	53	84
2008-09	53	74
2009-10	54	100
2010-11	55	94

to attract more and better students for teaching and for research. In order to achieve this we need to address the issues at many levels : Mathematical Communication Skills needs to be made a part of the first year curriculum through which the students can be trained in skills of comprehension, logic and communication of mathematical ideas; besides curriculum change one needs to relook at tertiary pedagogical practices too. Regular workshops of short duration on effective and inclusive practices of teaching mathematics may be organised for undergraduate teachers where there could be collaboration between mathematics teachers and mathematics educators. Finally, there is a need for more collaboration between the research mathematicians and the undergraduate teachers as this can help Mathematics teachers gain valuable knowledge and fresh perspectives, there by help improve the quality of Mathematics Education.

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Research Note

A Comparative Study of Multi-grade Teaching on the Achievement Levels in Hindi and Mathematics of Second Standard in Government and NGO Schools

Rita Arora* and Poonam**

Abstract

India has been striving to achieve 100 per cent literacy in primary education. 86th amendment of the Indian Constitution makes education a fundamental right for all children aged 6-14 years. Sarva Shiksha Abhiyan and Right to Education (RTE) Act of April 2010 aim to achieve the goal of Universalisation of Elementary Education. But despite the enormous efforts, India still struggles with the challenges in achieving 100 per cent literacy even in the primary education. 59 million children out of 200 million children in India in the age group 6-14 years are not attending school even today. Multi-grade Teaching has emerged as an alternate system of education the world over to achieve the goal of Education for All. It has been defined variously but essentially it is an education system in which students of two or more adjacent grade levels are taught in one classroom by one teacher, i.e. technique of simultaneous teaching of more than one grade by a single teacher. It was intended to study the efficacy of Multi-grade Teaching vis a vis conventional methods of teaching. The study focused on the effects of Multi-grade teaching on the overall achievement levels of the students in Hindi and Mathematics. The Study was carried out on 1000 students of second standard from primary schools. The study also aimed at determining the classroom processes and awareness of teachers towards MGT. Normative survey method was used for the Study. Self-constructed and standardised achievement test in Hindi and Mathematics along with a Reading Proficiency Test and Classroom Process Index scale developed by Dr. Lalit Kishore were as tools for the Study.

* *Head*, Department of Education, University of Rajasthan, Jaipur.
** *Lecturer*, Alankar Mahila B. Ed College, Jaipur.

Introduction

The Dictionary defines Multi-grade Teaching as a 'technique of simultaneously teaching more than one grade by a single teacher. Gupta, Jain and Bala (1996) define Multi-grade Teaching as 'a school condition wherein a teacher has to develop classroom activities for learners comprising of different grades in a single setting simultaneously'. According to Delos Anglese-Bautista (1994), the multi-grade schools are those 'which have classes that combine students of different ages and different abilities in one classroom'.

Multi-grade Teaching can also be defined as a class in which students of two or more adjacent grade levels are taught in one classroom by one teacher. Such multi-grade classes are embedded within the traditional graded system: students retain their grade labels and are promoted through the school with their grade level **(**Mason and Burns, 1996; Veenman, 1995**).**

Little, A. W. in the research paper titled "Multi-grade Teaching — A Review of Research and Practices", published in Education Research Paper Number 12 in 1994, describes Multi-grade Teaching as: **"**The teaching of students of different ages, grades and abilities in the same group is referred to variously as multi level, multi-grade, multiple class".

Multi-grade Teaching should be distinguished from multiage-within-grade teaching which occurs when there are wide variations in age within the same grade.

Evolution of Multi-grade Teaching in India

Though Multi-grade Teaching, as a concept, has existed for a long time now, India has witnessed growing interest in it only during the last two decades or so, though it is still restricted to a few schools run by individuals, NGOs and international organisations, with some help from the State/Central Government.

A large number of primary schools in rural India are single teacher schools where Multi-grade Teaching is a pervasive reality. In such schools, multi-grade situations exist but the Multi-grade Teaching, in the classic sense, does not take place, largely due to lack of knowledge by the teachers about the concepts of Multi-grade Teaching. Mono-grade teaching practices are followed in multi-grade situations. There is a need, therefore, to study the prevalence of various Multi-grade Teaching initiatives in India, examine the impact of Multi-grade Teaching on learners' achievements, and have a fresh look on the efforts of universalisation of elementary education for

affecting quality improvement and providing an added dimension to research in the area of elementary education.

Review of Related Studies

Brown, K. S., and Martin, A. G, 1989 in their study in eight elementary schools of Canada compare the achievement levels of students in Multi-grade Teaching schools with the students of single grade schools. No significant differences were found.

Eames, F. H, 1989 in his study compared the reading achievement scores of fourth graders in traditional, single grade setting with the combined fourth and fifth graders in multi-age, multi-grade schools. No significant differences were found.

Jean Russell, Kenneth J. Rowe and Peter W. Hill, Centre for Applied Educational Research, Faculty of Education, The University of Melbourne, in the study conducted in 1998 compared the effects of multi-grade classes on student progress in literacy and numeracy, including study of the perceptions of teachers and school leaders. Study found that multi-grade classes are used sometimes by choice but at other times as a result of the combined pressures from staff-student ratios and enrolment numbers at particular grade levels.

Kishore, Lalit, 2003 in his study found that most single teacher' schools in Government sector across India have become multi-grade schools by default, without adequately trained teachers, support system and teaching material. In NGO sector, Multi-level Learning is by choice and system gains maturity with a minimum time of three years in an evolutionary mode.

From the results of related studies as mentioned above it is found that practically a few work has been done in the field of multi-grade teaching in India. Hence the present study has been undertaken by the researcher.

Objectives of the Study

- To study the difference in the achievement levels of the students of Government and NGO schools in Hindi and Maths.
- To study differences in classroom processes of multi-grade schools vis-à-vis graded schools.
- To study the background/awareness of teachers related to multi-grade teaching vis-à-vis graded schools.
- To study the philosophy of imparting multi-grade teaching by different NGOs.

Hypotheses of the Study

There is no significant difference in:

- The achievement levels of the students of Government and NGO schools in Hindi and Mathematics.
- In classroom processes in Government and NGO schools.
- In background/awareness of teachers regarding multi-grade teaching of Government and NGO schools, and
- In the philosophy of imparting multi-grade teaching by different NGOs.

Research Method

The Normative Survey Method was adopted to collect the relevant information/data about the achievement levels of students in Government and NGO schools in the present study.

Sample

The student sample of the present study consists of 1000 students of Class II from primary schools 500 students each from Government and NGO schools of Jaipur District of Rajasthan, i.e. 300 boys and 200 girls. Students were selected on the basis of purposive sampling technique. Studies were conducted on two NGO schools, i.e. CULP and *Bodh Shiksha Samiti*, imparting elementary education to slum dwellers and weaker sections of the society of Chaksu Block of Jaipur District and Jaipur City respectively. Government schools selected for sampling were a mix of rural and urban schools of Jaipur District. For checking the classroom processes and awareness of teachers, 20 teachers each from Government and NGO schools were selected.

Tools Used

Self Constructed and Standardised Achievement Test in Hindi and Maths developed by the Researcher. A 'Reading Proficiency Test' was also developed for Hindi, and *Classroom Process Index Scale* developed by **Dr. Lalit Kishore.**

Statistical Techniques

To test the hypothesis of the Study the statistical techniques used for analysing the data included Mean, Standard Deviation, t-test, and Skewness.

Results

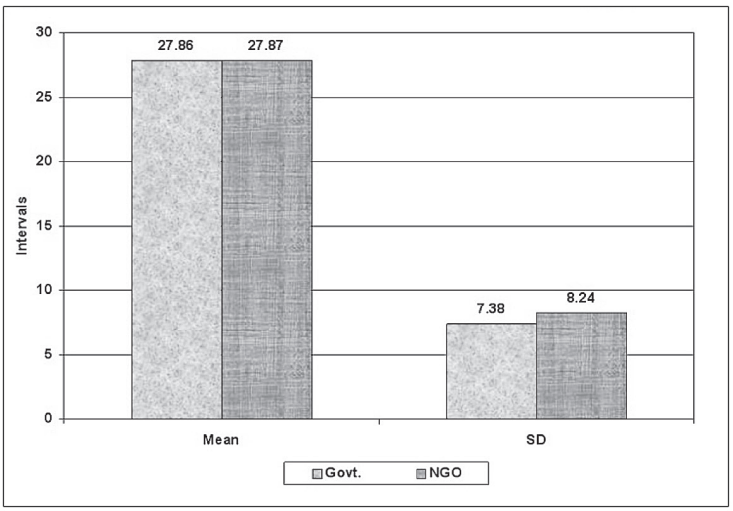
The Study found no significant difference in the achievement levels of the students of Government and NGO schools in Hindi and Mathematics; classroom practices adopted by NGOs school teachers are better than the Government schools; there is significant difference in the awareness of teachers towards the Multi-grade Teaching; and there is no significant difference in the philosophy of different NGOs imparting the Multi-grade Teaching.

Achievement Level of Students of Government and NGO schools in Hindi

No significant differences in the achievement levels between boys and girls of Government and NGO schools in Hindi were observed, though reading proficiency of students of Government schools is marginally lower than the NGO schools, as indicated in the table and the graph below.

Table 1: Achievement Level of Students of Government and NGO Schools in Hindi

Group	Number	Mean	S.D.	't' Value
Government	500	27.86	7.38	0.02
NGO	500	27.87	8.24	



Graph 1 : *Achievement level of students of Government and NGO schools in Hindi*

Achievement of Students of Government and NGO schools in Reading in Hindi

School	No of Students	Word Recognition			Creative Aspect		
		A1	A2	A3	B1	B2	B3
		Hijje (spell a word in parts)	Whole Word	Fluency	Punctuation Marks	Expre-ssion	Stress on Words
Govt.	100	61	36	21	14	27	9
NGOs	100	53	44	30	22	28	8

Out of the sample of 1000 students, 100 students each of the Government and NGO schools were selected randomly to test the proficiency of the students on the aspect of reading Hindi language. On an average a mix of five students per school were selected for reading.

The scores at the Table show that out of 100 students of Government schools, 61 per cent could not read/ pronounce the whole word together, e.g. pronouncing Jaipur as J- - y- - pu - r. Only 36 per cent could recognise the whole word. Amongst NGOs students, a comparatively lesser number, i.e. 53 per cent could not read the whole word. A larger percentage of NGOs school students, i.e. 30 per cent against 21 per cent of Government schools, were found to be more fluent in Hindi.

This shows that reading proficiency of students of Government schools is marginally lower than the NGO schools. This could possibly be attributed to inadequate practice to the students in reading out the words and sentences, or more emphasis on writing practice vis a vis reading practice. On the other hand, NGO schools use flash cards to develop sight vocabulary. During interaction, teachers at NGO schools reported that the students who do not have developed sight vocabulary suffer from the same weakness in reading Hindi as in Government schools.

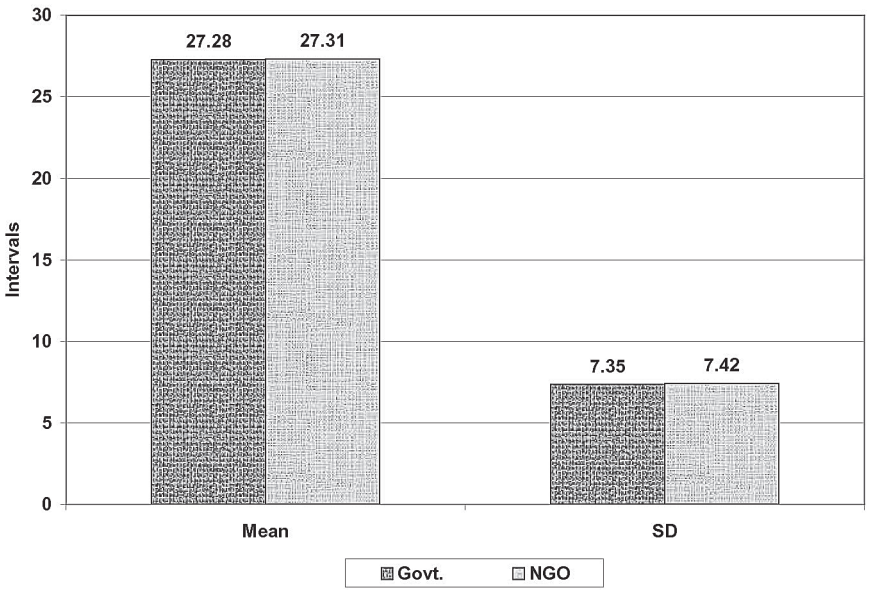
The results achieved are in consonance with the results achieved through other surveys conducted recently. Assessment Survey Evaluation Research Centre (ASER), New Delhi Report 2010 states that during a survey of students of Class 4 in UP, only 1/3rd children could read standard II level text fluently; another quarter or so were comfortable reading simpler standard I level texts; almost half the children of standard IV in Government schools cannot even read the simple text of standard II.

Achievement Levels of the Students of Government and NGO schools in Maths.

No Significant Difference in the Achievement Levels of Students of Government and NGO schools in Maths was observed. To study/examine the Hypothesis in greater details, Researcher conducted tests to check the 'Achievement Levels of Boys and Girls Students of **Government Schools** in Maths', and 'Achievement Levels of Boys and Girls Students of **NGO schools** in Maths'. Results indicate significant difference in the achievement levels between boys and girls of both Government and NGO schools in Maths where girls have outperformed the boys**.** However, the hypothesis that there is no significant difference in the achievement levels of students of Government and NGO schools in Maths still holds good.

Table 2: Achievement Levels of the Students of Government and NGO schools in Maths

Group	Number	Mean	S.D.	't' Value
Government	500	27.28	7.35	0.06
NGO	500	27.31	7.42	



Graph 2 : Achievement Levels of the Students of Government and NGO schools in Maths

This result is almost similar to the previous studies. Several studies on multi-grade teaching showed that no significant differences were found in the achievement in Maths of students of graded and multi-grade schools.

Rule, J. G. (1983) compared the Maths achievement of third to sixth graders in multi-grade classes with the achievement of those instructed in single grade classes. No significant differences were found.

Mobley, C. F. (1976) investigated the effect of single-age and multi-age grouping on reading and Maths achievement of children in their first, second and third years of schools. Results significantly favored multiage grouping.

Stone (1986), Knight (1988) examined possible effects of multi-grade classes on Maths, Science, reading and language. The result showed no significant difference between multi-grade and single grade students in overall achievement.

Finley, Carmen J. and Thompson, Jack M. (1963) examined the comparative achievement of multi grade and single graded rural elementary schools children in California. No differences in achievement between single and multi-grade classes were found when tested in Maths, English and other subjects.

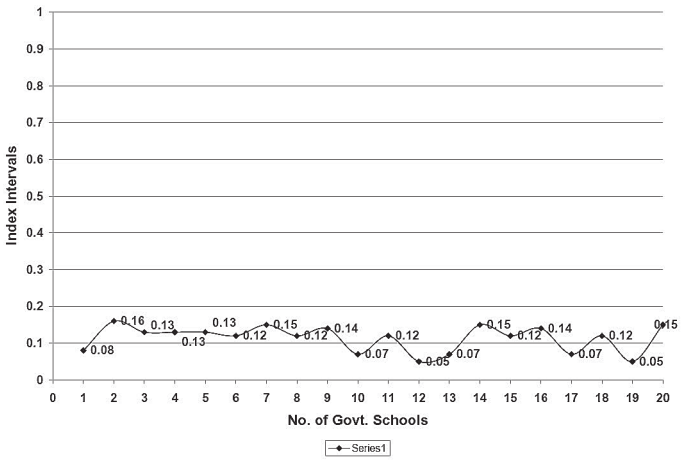
These studies lend support to the present research that there is no significant difference in the achievement levels of students of Government and NGO schools in Maths. The NGO schools who are imparting multi-grade teaching showed similar achievement levels of students in Maths as shown by Government schools students.

Classroom Process Index (CPI)

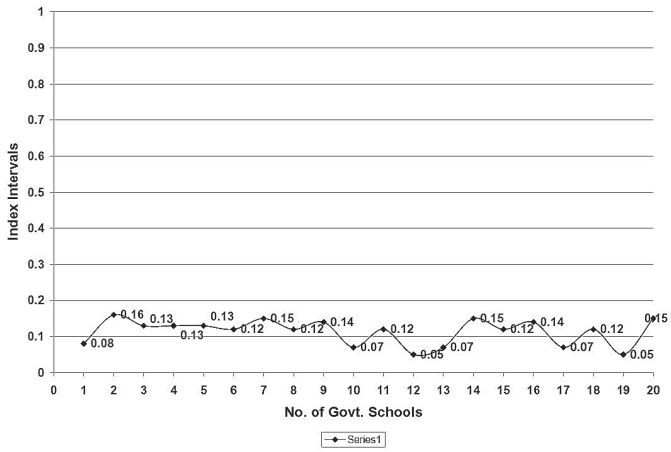
There is no significant difference in the Classroom Process Index values of both Government and NGO schools. In the case of NGO schools, the most schools are very near the 'mediocre' range but only one school out of 20 had shown a high level of positive index range and it is very near to the 'normal' distribution curve, as indicated by the value of skewness. Study of effectiveness of teaching process indicated a significant difference in the background/awareness of teachers in NGOs school vis a vis graded schools. NGOs school teachers are well aware of the concept. The views of the Government school teachers emerge as the training needs of the teachers and should be incorporated in the in-service training programmes of the *Sarva Shiksha Abhiyan* (SSA).

No significant difference in the philosophy of multi-grade and multi-level teaching by different NGOs has been observed since their

basic assumptions about children and learning are the same even though the methodology varies, either by choice or as a problem solving method. Some NGOs follow the concept of multi-grade teaching while others follow the concept of multi-level teaching; some are aimed at educating only girl child whereas others target both boys and girls; some impart education only till primary level whereas others conduct classes till 12th standard. The basic philosophy of multi-grade teaching remains the same—let the child self learn at his own pace.



Graph 3: CPI of Govt. Schools



Graph 4: CPI of NGO schools

Background awareness of teachers related to multi-grade teaching vis a vis graded schools.

Study of various aspects of the effective teaching process indicated a *significant difference in the background/awareness of teachers in NGOs school vis a vis graded schools.* NGOs school teachers are well aware of the concept.

Philosophy of imparting multi-grade teaching by different NGOs.

No significant difference in the philosophy of multi-grade and multi-level teaching by different NGOs has been observed since their basic assumptions about children and learning are the same even though the methodology varies, either by choice or as a problem solving method. Some NGOs follow the concept of multi-grade teaching while others follow the concept of multi-level teaching; some are aimed at educating only girl child whereas others target both boys and girls; some impart education only till primary level whereas others conduct classes till 12th standard. The basic philosophy of multi-grade teaching remains the same—let the child *self-learn* at his own pace.

Recommendations

Mono-grade Teaching in Multi-grade Situations. A large number of schools in rural areas in developing countries like India are *single teacher*, with low student population. In such schools, though multi-grade situation exists, multi-grade teaching does not occur. Such schools continue to follow mono-grade teaching in multi-grade situations. Teachers can be trained the nuances of Multi-grade Teaching.

Multi-grade Teaching—Not a Second Class Solution. In a vast country like India, with large rural population and high *dropout* rates, Multi-grade Teaching is perhaps the only way to achieve the target of 'education for all'. Multi-grade schools should not be considered a *second class solution* anymore.

Multi-grade Teaching — A Success Story. Multi-grade Teaching is based on the pedagogically established facts. In most NGOs, the initiatives on Multi-grade Teaching are successful as far as the learners' achievement is concerned. Students learn in a fear free environment, perform as well as students in Government schools. Indeed in certain fields, the students of the NGO schools outperform the students from Government schools.

Multi-grade Teaching—An Alternate Education System. During the last few years in India and various developing countries, Multi-grade Teaching is being increasingly considered as an alternate education system to achieve 100 per cent literacy rate, at least at the primary level. Various Multi-grade Teaching initiatives have been launched successfully in Government schools, in collaboration with the NGOs, supported by international organisations.

Training the Trainers. Teacher is the most significant and critical figure in the multi-grade situation. Despite the prevalence of Multi-grade Teaching situations in India, evidently no serious effort has been made to include Multi-grade Teaching in training curriculum of teachers. Though teachers are generally aware of the concept of Multi-grade Teaching, ironically, Multi-grade Teaching neither forms part of syllabi for students of Bachelor of Education, nor for teachers training of Government schools.

Language Training. Students both from Government and NGO schools did not perform well in test conducted on *Hindi Reading.* Current classroom practices must therefore be reviewed and revised to make teaching-learning in languages more effective and interesting.

Awareness Campaign. Conferences/ seminars/ workshops must be organised at district, state and national level to create awareness about the Multi-grade Teaching.

Conclusion

Multi-grade schools are often the only way to ensure quality education in rural and remote areas with low and scattered population. The choice in favor of multi-grade schools is often a choice between education and no education. A large number of primary schools in rural areas, particularly in developing countries, are one-teacher schools. In rural areas multi-grade instruction is not a new educational trend, but a necessity imposed, in part, by economic and geographic conditions, paucity of teachers and few students in the class.

Multi-grade Teaching is emerging as a form of schooling in many countries in the Asia and Pacific Region as they strive to meet their commitment to provide education for all.

Multi-grade Teaching has a number of advantages over graded schools like greater cross-age interactions, leadership and followership skills, absence of unhealthy competition due to

children of different ages; there are no *dumb groups* since children of different age groups are expected to be at different levels; children are encouraged to learn at their own pace; multi-grade education emphasises wholesome development of the child.

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Field Experience
A Reflective Practice in Education

Kalpana Venugopal*

Abstract

This is a qualitative paper employing the narrative style of reporting a field experience in school from a reflective perspective. It delineates the objectives and the methodology adopted; elaborates the field activities undertaken and discusses the reflective gains from this practice to education-both that of learning and teaching and the learner and teacher.

Introduction

Field experience is an individualised, experiential learning opportunity where one applies her/his knowledge and skills. The goal of field experience is to bring teaching to life by specifically helping professionals strengthen their philosophy and understanding of the field. Field experience can provide opportunities for the professional to apply the knowledge, theory, concepts, skills and abilities to teaching; be personally involved in developing, planning, executing, and evaluating activities with and for groups and individuals; gain additional insight into learning styles, teaching strategies, teaching-learning material,classroom management, school-community linkages and teacher training programmes; deploy appropriate intervention programme(s) for student empowerment; increase professional self-awareness and accumulate experience to help enhance one's own professional competence through a process of reflection.

NCERT's field experience program is designed to reflect its commitment to a community of learners guided by knowledge,

* *Associate Professor*, RIE, Mysore

values, and experiences. The purpose of the programme includes teaching in the school along with carrying out research/study/ feedback collection/try-out of materials/advocacy or any other such intervention as deemed to be fit and is in accordance with the mandate of NCERT. To achieve this purpose faculty working in different constituents of the NCERT are required to undertake fieldwork in different schools of the country for a period of at least 3 months. This enables to reflect on the various aspects of its materials including textbooks, programmes and policies based on actual field data and feedback. When an organisation engages itself in reflection it equips itself to become an"educative organisation" as it is able to rethink ways to harnessthe very considerable reservoir of talent and energy invested in its workforce. Self-energising, self-renewing organisations, we know, are ones that are also more successful (Smyth, J. 1993).

Objectives

To enable the field investigator to reflect on the:

- approaches and strategies delineated in the NCF 2005 in the teaching of Social Science (Constructivist approach and Critical Pedagogy)
- use of CCE tools in the teaching of Social Science
- on the NCERT textbooks through the perceptions of students and teachers
- the school guidance and counseling package
- on the linkage between theory and practice of teaching

Methodology

Planning

The premise for selection of school for field work was that the school be adhering to the principles and approaches towards teaching and learning as delineated by the NCF 2005, while using the textbooks and TLM designed by the NCERT and that it should cater to the needs of rural children, so as to gain an understanding of the nuances of teaching and learning there in. The investigator visited a few schools for this purpose. *Jawahar Navodaya Vidyalaya* at DMG halli, Mysore was identified as the school fulfilling the aforesaid criteria, after the investigator paid an initial visit to the school.

The fieldwork was executed for a period of three months, where in the investigator was engaged full-time in the school. The activities

included teaching of social science and the employ of approaches and strategies of constructivism and critical pedagogy in the course of teaching; design and use tools of CCE; school guidance and counseling; and gathering perceptions of students and teachers on NCERT's textbooks.

Tools

The tools used include lesson plans, Teachers Teaching Profile (*developed at RIEM*), feedback form for students on classroom practices and questionnaire on perceptions of students and teachers on textbook, (*developed by investigator),* Standard Progressive Matrices –Raven, J.C., High School Personality Questionnaire –IPAT, Scientific Aptitude Test Battery—Agarwal and Arora, Personal Style Analysis (*Source-IDGC- developed at RIEM*),Class Talks and Career Talks (*Guidance and Counseling Package developed at RIEM*).

Activities undertaken

Teaching

The investigator taught social science for classes VI to X and completed eight lessons in the course of the fieldwork. This enabled to try out approaches such as constructivism and critical pedagogy. Lesson Plans were developed for the same. A sample of the lessons using constructivist and critical pedagogy approaches are discussed.

Constructivist Approach—The investigator employed the constructivist approach in teaching Social Science by planning lessons according to the seven E's of constructivist learning (Arthur Eisenkraft, 2003)—Elicit, Engage, Explore, Explain, Elaborate, Evaluate and Extend. Elicitation through inquiry questions enabled to generate discussion and debate. Topics in social science allow for building conceptual understanding by engaging the students thus. Students were also prompted to provide plausible causes and justify issues in the light of contemporary events. They were motivated to explore for other information to substantiate their explanation by using other sources like the library and internet. They attempted to evaluate social situations and draw conclusions based on evidences. They were also able to elaborate and extend their understanding and inferences to events happening around them.

Through the lesson "Sectors of Indian Economy", students were engaged in a discussion about the transition of economy from an agrarian sector to industrialised and service sectors; inquiry

questions enabled them to explore possible factors that brought about this transition; explained the necessity to transit; elaborated and evaluated the effects of developing all the sectors of economy and extended its impact on the world economy. In the process of constructing the concepts about the sector, students were able to provide ample examples from their own lives (as most of them belonged to agrarian families) and the society around them. They tried to reflect on the impact of the transition on their own lives.

Critical Pedagogy—The field investigator used critical pedagogy as an approach in the teaching of social science by employing a shift from the narrative method to the critique method of teaching. Critical pedagogy as a teaching approach attempts to help students' question and challenge domination, along with beliefs and practices that dominate them (NCF 2005). Teaching-learning practices are designed to raise the critical consciousness of student's regarding oppressive social conditions; provides for an opportunity to critically reflect on issues in terms of their social, political, economic and moral aspects; entails the acceptance of multiple views on social issues and commitment to democratic forms of interaction. A critical framework helps children to see social issues from different perspectives and understand how such issues are connected to their lives (Burbules and Berk, 1999).

This approach actually enabled students to enquire and explore how society is structured, managed, and governed. They were able to critically examine the forces seeking to transform and redirect society in various ways. Through this process of learning, the dynamics in the class provided for difference in opinion. The approach to teaching was thus open-ended wherein the teacher (field investigator) was only a facilitator to direct the course of debate and discussion. The lesson "Money and Credit" provided ample scope to critically examine various types of credit, variety of credit engagements in the rural sector and the role of banks in promoting agriculture in India. Students were able to collect additional information regarding credit facilities provided by nationalised banks for various types of agricultural purposes, along with small and large industries; substantiate their arguments for greater agricultural credit facilities and a more vigilant RBI; relate information to the conditions of their families as agriculturalists. It provided for exchange of ideas and experiences; enabled to develop skills of constructive argumentation, tolerance for difference of opinion and social awareness and participation. The students presented their arguments for farmer-

friendly agricultural credit facilities in the form of a letter to the Governor of RBI.

Teacher teaching profiles and student feedback forms were used to collect feedback from the teachers and students.

Evaluation

Continuous Comprehensive Evaluation (CCE): The investigator designed and used tools of CCE such as open book test, assignment, class discussion and debate, poster presentation, observation report and note checking. The open book test enabled students to read the textbook thoroughly and refer to additional reading material to answer given set of questions. Four different sets of questions were prepared so that students would not be able to consult their peers. Students were asked to exchange their answer sheets. Post test discussion of answers enabled them not only gain an understanding of the concept but also the style of presentation by their peers. Assignments included theme-based tasks to be completed as class work/homework. These were open-ended or structured and some were also based on contexts beyond textbooks like assignment on the lesson Sectors of Economy included presentation of a report on 2011—budget of the central government, towards allocation for primary and secondary sectors.

Class Discussion/Debate included topics like "Industrialisation: Boon or Bane for workers in Bombay"and "Consideration of Colonialists in South Africa in the designing of the Constitution". Students had to present their arguments by referring several sources and the references were included in the report. Poster Presentation allows for the use of pictorial, graphical, news cuttings to represent learning concepts. Graphical representation of data on the 'credit facilities by nationalised banks for various agricultural and industrial purposes' and pictorial representation of the earth by satellites were activities assigned to students.

Through observation reports students reported observation of the '*sapta rishi*' and the 'pole star' in the night sky, and related their experience including the direction and their position on the ground. Students' notebooks were checked and feedback provided regarding—irregularity, handwriting, spelling errors, and conceptual errors. A feedback form was used to collect student feedback.

Perceptions on the Textbooks

A questionnaire developed by the investigator was used to collect

student and teacher perceptions on the textbooks. The analysis of the perceptions of both teachers and students of the class X social textbooks showed that, they found the content and style of presentation, evaluation exercises interesting and visuals particularly good with respect to the geography and economics books. In the case of History they found the content is bulky but presentation is good. Some of the exercises were not found interesting and a few visuals were not clear. The politics book was found to be the most interesting and exciting; visuals especially the cartoons are thought provoking and enable picturesque comprehension. The students particularly were amused that there was a controversy about using them and expressed in unison, that it provided respite from the drudgery of learning with mere words and in no way was a matter of ridicule.

Intervention: Guidance and Counseling

Appraisal through Cumulative Profiles

The investigator planned a programme of psychological assessment and appraisal for class XII on the referral of the class teacher. Psychological assessment fulfills the goals of counseling. It involves integrating and interpreting of assessment data (Hood, A. B and Johnson, R. W. 2002). Here, the investigator used psychological tools to test mental ability (Standard Progressive Matrices-Raven, J. C. 2004), personal styles (Personal Styles Analysis), personality (High School Personality Questionnaire, IPAT) and scientific aptitude (Scientific Aptitude Test Battery SATB –Agarwal and Arora 1993) and correlated this with the academic achievement (test scores of class XI- CBSE).

Based on appraisal data provided after the analysis, students were grouped and the Principal arranged to meet with each individual student along with the investigator in order to provide for additional academic support according to their needs wherein the investigator also oriented them on preparing weekly study plans for each subject. During the course of this meet the class XII teacher reported that four students of the same class showed little or no interest in academics, engaged in disruptive behavior in class and when coerced to study were aggressive. The investigator required preparing a cumulative appraisal profile of each of them. Cumulative appraisal profiles enable to organise, summarise and integrate appraisal data for reporting (Milner, J., and O' Bryne, P. 2004) Herein,

the cumulative profile consisted of data on mental ability, scientific aptitude, academic achievement, interest, personality, personal style analysis, observation reports, cumulative records, interviews and case conference reports. Through these the investigator was able to provide guidance to students. Through all these exercise of collecting data through the tools and analysing teachers were engaged.

Group guidance activities

Substitution classes were used for group guidance activities such as class talks and career talks. The activity was chosen according to the level of the class. Group guidance activities included class talks, career talks and life skills. Topics for class talks include—developing study habits, achieving excellence in exams, healthy competition and cooperation, need for educational and career planning, time management, improving memory and goal setting; Career talks included careers in Journalism, Indian Army, Fashion designing, Civil aviation, Advertising, Science research. The investigator deliberately chose to talk on careers that student were not much aware about. Talks on life skills included- Decision-making, Problem solving, Self-awareness, Effective communication and Coping with stress. Teachers of the school also chose to talk on some of these topics with the aid of material provide in the Guidance package.

Analysis and Discussion

For the investigator, the fieldwork is a reflective experience as a teacher educator involved in training teachers to undertake all the above activities. On analysing the experience it enabled to gain insight into various aspects of the processes in the school.

Students expressed that their learning experiences were different from those of regular classes engaged earlier; they could participate freely and actively in the class; motivated all to engage in the class; able to connect to the subject by relating it to their everyday life; their own experiences were valued; they were able to contribute to the larger picture of the concept; became aware of their social responsibilities in the course of discussing various issues that were closely connected to their families and community and able to draw plausible solutions to problems and issues in society. They also learnt to give a patient hearing to other's points of view and respect differences. They said that strategies adopted enhanced their interest in learning the subject. Teachers reported that they had received theoretical inputs on such approaches of teaching and engaging

content through workshops but were unaware of the practice. After the observation they too engaged in similar ways and requested the investigator to observe and provide for feedback accordingly. They also observed that it was not possible to use innovative approaches for the entire syllabus due to paucity of time.

Reflecting on the linkage between theory and practice, the investigator had the opportunity to actually check out the oft-expressed apprehensions of trainees that it is not pragmatic to try out innovative approaches/strategies in the classroom. The ingenuity lies in providing for as much creativity and flexibility in the plan as the innovative approach/strategy itself, so as to be able to create and recreate the lesson as the teaching moment demands in the class. The challenges being the compulsion to complete the syllabus, catering to the needs of different types of learners and their levels of learning and the resistance to change, both by the teachers and the school system. The teaching moments and experiences of the classroom will enable to provide realistic illustrations in teacher education classes.

Engaging in peer observation and team teaching illumined the investigator of innovative strategies employed by teachers like peer tutoring, mnemonics for timelines and events and peer evaluation.

Students found CCE activities to be interesting and different in that they did not have to copy from the text for completing assignments which they had expressed was a boring exercise. They particularly were excited about poster presentation wherein they used cartoons to present information; this exercise was found to be creative too. They found the task of collecting information from other sources to be very informative and improvised their browsing skill. Working in small groups taught them to tolerate differences and help each other and improvised communication and persuasive argumentation skills. They expressed that the open book test was not as simple as it sounded as the questions compelled them to deliberately read the textbook purposefully and also use additional material from the library and net. Teachers appreciated the CCE activities and said they were always following the traditional method of assessment, which was cumbersome and time consuming. They began to employ some of these techniques in the next set of CCE.

The spirit of CCE also was comprehended better when put to actual use in the classroom by teachers and the investigator. CCE was not to be viewed as a boring and tiring exercise, apprehending students and deterring their performance. Reflecting on this, the

investigator came to realise that practical exercises should be a part of CCE workshops within simulated class situations.

Students also expressed their gains through group-guidance activities as the information provided through class talks could easily be put to us; increased their awareness of a wide range of career options and it forced them to rethink their choices. Students who were referred for counseling said they had gained by the direction provided, and that they were unaware that they needed help. They also opined that their teachers should be enabled to help out in this aspect. Cumulative profiles enabled class XII students and teachers to gain a better understanding of the course of action to be adopted by them. Teachers expressed that the hands on experience in the guidance exercises provide them inputs and confidence in handling student issues. They were also encouraged to put to use substitution hours effectively for group guidance. They suggested changes in the guidance package modules based on their context and need.

The investigator also took the opportunity to try out the earlier developed School Guidance and Counseling Package in the course of the intervention undertaken in the field. It was found that inputs were required to be added and revised in the perspective of, purpose and objectives of different school systems such as the JNV, needs of students in a residential set up, locale and socio economic conditions of students, relationship between teachers and students there in, role of the school in school-community linkage. Reflecting on the experience it is also required to provide for practical exercises for teachers in workshops on guidance and counseling.

It was a first-hand experience for the investigator to use the NCERT textbooks for teaching Social Science. This enabled to try out the learning activities of the textbook in the class and observe student participation. It also provided an opportunity to note the extent of textbook usage by students and their ability to comprehend the same. The perceptions of teachers and students on the textbook prompted the investigator to plan a thorough exercise to analyse the textbooks.

The teacher educator's experience of actually being the teacher in the field to study and experience the ground realities will surely enable her to recount these experiences in the teacher education classes and aid in bridging the gap between educational theory and actual classroom practice, revisit materials developed and plan practicum based training programmes for teachers.

Conclusion

Thus, engaging in fieldwork provides for a valuable opportunity to apply the theory of teaching; design and try out activities; gain insight into learning styles, teaching strategies, textbooks, classroom management, student guidance and counseling, school-community linkages and thereby increase professional self-awareness and accumulate experience to help enhance one's own professional competence as a teacher educator and in turn re-design teacher education programmes.It is imperative that field-engagers also meticulously plan a programme based on one's area of priority and reflection. As teacher educators, such exercises enable us to reflect on our practices.

For, reflection is fundamentally about creating improvements in educational practice, and the social relationships that underlie those practices. Reflection is founded on the belief that knowledge about teaching is in a tentative and incomplete state, and as such, is continually being modified as a consequence of practice (Smyth, J. 1993).

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COMPLETED ERIC PROJECT SUMMARY

Experience and Consequences of Happiness: A Study of Happiness among School Students and Teachers*

ASHOK K. SRIVASTAVA** AND GIRISHWAR MISRA***

ABSTRACT

The pursuit of happiness is an ever continuing process in all societies. The experience of happiness affects the personal, socio-emotional, and task performance of the people. The societies, however, differ in their conceptualisation of happiness. In individualistic societies more importance is given to personal traits and achievements of the individuals in their conceptualisation. The collectivistic societies, in contrast, view happiness resulting from positive social relationships and task performance. The Indian sub-continent offers a pluralistic vision on knowledge and reflects diversity in viewing reality. The Indian way of thinking is characterised as context sensitive and operates with abstract generalisation and universal categories. The Indian perspective on reality and human functioning is holistic, recognises coherence and natural order across all life forms, emphasises self-discipline, and gives dharma as the sacred moral code. In particular, the study examined the Indian notion of happiness using multiple resources. Also, the perception of school students and teachers on happiness as well as strategies adopted by them to be happy in life and promote happiness in others were explored.

The Main Objectives of the Study are

(a) To discern the nature of happiness by analysing Indian scholarly literature;
(b) To explore the construal of happiness among the students and teachers; and

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** *Professor*, NCERT, New Delhi
*** *Professor*, University of Delhi, Delhi

(c) To examine the experience and consequences of happiness in the sample of school students and teachers.

Research Questions

The study addressed the following research questions:

(i) How is happiness conceptualised in the Indian tradition? Where does this view stand in the context of mainstream scholarship in psychological conceptualisation of happiness? In what way they complement each other? Are there different ways of understanding/experiencing happiness?

(ii) What do school students understand by the construct of happiness? When and how do they experience happy and unhappy events? How happy are school students and teachers?

(iii) What are the factors that promote happiness or a happy life as perceived by the students and teachers? How does happiness affect day-to-day life of students and teachers?

To achieve these objectives, a two-pronged strategy was adopted. First, an attempt was made to discern the notion of happiness as described in various Indian scholarly texts. Second, an empirical study was conducted to know the concept and determinants of happiness among school students and teachers.

Analysis of Ancient Textual Materials

This study attempted to discern the Indian notion of happiness by analysing Sanskrit *suktis*. The ancient Indian scholarly texts, which were written in Sanskrit language, contain knowledge in the form of *Suktis* or *Subhasitas* (good words). After analysing three Sanskrit dictionaries, 529 *suktis* related to happiness were collected and analysed. Results revealed that the *suktis* defined happiness in terms of personal characteristics of the people (such as contentment, control over desires, surrender, non-attachment, equanimity in opposites, freedom, hard work, perseverance, good health, and wisdom). Some of the social characteristics such as having wise friends, maintaining harmonious family relationship, charity and service to the needy, sacrifice, performing religious duties, and having good relationships at the work place also contribute to attaining happiness. Attainment of knowledge is another source of happiness. Viewed as one of the highest mental state, called *anand* or bliss, happiness comes by surrendering to the Almighty. The concept of sorrow or pain is interwoven in the Indian view of

well-being. Therefore, a happy person remains non-attached to the outcomes of his/her actions, maintains equanimity in opposite circumstances, and understands the cyclic nature of happiness and unhappiness. Happy people experience abundance of all basic requirements like food, money, friend's prestige etc. They gain respect for their self from both professional and social quarters. They are bestowed with the company of the wise, loved by close ones, remain free from debts and have certainty of livelihood. Like happiness, unhappiness is also an essential part of human life and helps in his/her growth. The analysis shows the relational nature of happiness in the Indian context.

The analysis revealed that happiness is derived from diverse range of activities/experiences and the duration of these experiences very considerably. Also, the source of happiness could be extrinsic or intrinsic. The presence of a physical object is not essential for the experience of happiness. A person's internal conditions could bring extreme happiness to him/her. Further, the value of an extrinsic object to bring happiness varies according to the context (*desh*), the time (*kaal*), and the person (*patra*). Also, a truly happy person remains unchanged in joy or sorrow.

Construal of Happiness among School Students and Teachers

To understand the notion and consequences of happiness among school students and teachers, a 26 item self-report measure was administered on 885 school students and 140 teachers. The student sample was drawn from three localities, namely Delhi, Gorakhpur urban and Gorakhpur rural. The teachers came from Delhi and Gorakhpur urban only. The 26 items were related to the five dimensions of happiness, namely (1) experience of happiness, (2) life satisfaction, (3) personal control, (4) emotional reactions, and (5) personal and social concerns, additionally, 135 students were interviewed to have in-depth understanding of their conceptualisation of happiness.

Analysis did not reveal much difference in the conceptualisation of happiness of the participants from three localities. Both teachers and students, in large numbers, reported that they were happy, experience happiness regularly, laugh regularly, have minimum health problems and motivate others to be happy and do good work. They are satisfied with the outcomes in life and consider life to be meaningful. The sources of their happiness lies in accomplishment of tasks (such as doing studies/teaching, success in examination,

goal attainment, doing things of their choice, and working honestly) and social relationships (such as being in the company of friends and family, serving parents/elders/needy, happiness of the family, etc.). It was reported by the students that they feel good and excited when they are happy. However, both students and teachers felt that situations governing the happiness are not in their control.

This research supports the argument that the nature of people's construal of social world determines their level of happiness and well-being. In the Western societies, characterised by individualism and de-contextualised nature of the self, the source of happiness and well-being lies in the external world. In contrast, the Indian context, characterised by collectivism with stress on contextualised worldview, considers happiness and well-being as emanating from the internal conditions of the individual. People derive happiness by relating to the others and successfully performing one's duties. The study argues for developing a deeper contextual understanding about the nature of happiness and well-being in diverse contexts. The results also show congruence in the ancient and contemporary Indian thought about the nature and effects of happiness.

The Study has Implications for Understanding the Goal of Education

In the Indian context, education is considered key to success as it empowers humans by realising human potentials and bringing in excellence in action. It is through education and learning- *sadhana* of *vidya*-that one may attain liberation and realise its true self. As narrated in one of the famous Sanskrit verses, education imparts intellectual culture; intellectual culture secures capacity and stability; capacity and stability enable to secure wealth; wealth so secured enables to perform dharma, which in turn secures happiness. Happy people typically feel empowered and remain in control of situations. Those who feel empowered rather than helpless would typically do better in school, cope with stress and live more happily. When people are deprived of control over one's life, they suffer lower morale and worse health. Therefore, the ultimate pursuit of education should be to make people happy.

The experience of happiness is not a one-shot affair; nor do all individuals feel happy by a particular object or event. The schools need to organise a series of happiness producing events throughout the year. Rather, it should be made a part of school routine. The

activities should be organised in a manner that the students feel themselves important and need to be related to their daily life.

It is important to develop an understanding about the relative nature of happiness and unhappiness among students. The students need to understand that the unhappiness or sorrow is not always undesirable; rather, it provides an opportunity to realise that happiness and unhappiness are two sides of the same coin. Pain or suffering teachers one to adjust in adverse circumstances and also helps in initiating the process of self-discovery. The students should be trained to treat happiness and unhappiness equally.

A Study of the On-going Processes of Pre-service Elementary Teacher Education Programme in Maharashtra*

Jyoti Bawane**

'The destiny of India is being shaped in its classroom' as quoted by Kothari Commission has its relevance even today to re-emphasise that Education is one of the factors that contributes significantly towards nation's building and development. It is certainly true that the progress of our country to a large extent depends on its quality of education imparted in schools and higher education institutions. The strength of an education system, on the other hand, largely relies on the quality of teachers, who play a vital role in imparting this 'quality education' within the classrooms. However, the performance of teachers is likely to depend on the kind and nature training they had received during the pre-service programme. This ultimately lead us to the core factor, the teacher education programmes which are accountable for developing competent teachers who are expected to perform effectively in different educational systems. This in other words, implies that the school education has a symbiotic relationship with the teacher education (Joshi and Ahuja, 2004).

Although, teacher education programmes in India, have undergone reforms time and again, it has been consistently indicated that learning outcomes in primary schools are far from satisfactory (ASER, 2011; Pratichi Education Report, 2002; PROBE, 1999). ASER has reported that even after four years of schooling, close to 70 per cent of children cannot easily navigate text that is meant for children two grade levels below. The report also shared that although children do learn some things during the course of the school year, the level that they attain is insufficient for them to get to an adequate or comprehensive level of learning as currently expected, or build the foundation for learning in higher grades. In early 70's Chinna

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** *Associate Professor*, Centre for Educational Studies, Indian Institute of Education, Maharashtra.

Chacko, a former member of NCERT, in a paper presented at the International Reading Association in 1971, highlighted that "Many things are done the same way they have been done for centuries and, as a result, our primary teacher-training schools and primary schools are like museums in which old ways are carefully preserved" (Kumar, 2011). This situation continued to be the same and even today. Teachers prefer continue to adopt traditional methods of teaching in spite of the advent of advance technologies. Further, it is more disheartening to know that majority of the aspirants choose the career to be a primary school teacher in India, because it is a last resort (Kumar, 2012; Ramchandran and Pal, 2005).

These findings to a large extent reflect on the efficiency of the teachers in our school system and also highlights that reforms in teacher education has not significantly changed the scenario of elementary school education. Over the recent years, the sector of teacher education has suffered from commercialisation and other setbacks which have led to significant deterioration in the quality of teacher educators serving in institutes and colleges of teacher training" (NCERT, 2009). The task of bringing qualitative change in institutional efficacy of the teacher education system in itself is a huge and challenging one (Joshi and Ahuja, 2004). Looking at the prevailing status of elementary school education, several queries are raised on the efficiency of the pre-service elementary teacher education programmes. Hence, an attempt was made to study in detail the nature and kind of inputs provided in the elementary teacher education programmes, by observing the classroom practices and teaching practices of both the teacher educators and student teachers respectively, involved in elementary teacher education programme.

Objectives of this Study

1. To observe and analyse in detail the ongoing process of D.Ed programme in terms of their;
   (a) Teaching learning processes in the classroom
   (b) Practice teaching classes – school experience programme
2. To analyse the student teachers' and teacher educators' perceptions with regard to the on-going processes of elementary teacher education programme.
3. To suggest and devise alternate frameworks for improving the pre-service elementary teacher education programmes.

Research Questions

1. What are the prevailing on-going processes in the prevailing D.Ed teacher education programmes?
2. How do the student teachers conduct their practice teaching in the schools?
3. What are the student teachers and teacher educators' perceptions of the prevailing teacher education programme?
4. What are the recommendations for the improvement of the prevailing D. Ed education programmes?

Methodology of the Study

The present study envisages to study in detail the classroom process of the elementary teacher education programme in Maharashtra. Since, the classroom processes has largely been captured through observations, both quantitative and qualitative data has been collected.

Sample: The present study is confined to four D.Ed colleges located in and around Pune city. Since the college is the unit of the sample, their selection was done purposively to ensure that they represent different geographical locations and management. Observations of 216 teacher educators and 294 student teachers representing these colleges were conducted. The feedback was obtained from 122 student teachers and interviews were conducted with 12 teacher educators.

Tools: The data was collected by adopting the following four tools;

1. Observation Schedule for Teacher Educators
2. Observation Schedule for Student Teachers
3. Feedback Questionnaire for Student Teachers
4. Interview Schedule for Teacher Educators

Data Collection: Observations of both teacher educators and student teachers were conducted after obtaining prior permission from the respective college principals. The observations of the complete class were hand recorded on the developed observations schedule.

The student teacher feedback questionnaire was administered to the whole class. Prior to administering the questionnaire, instructions were provided to the student teachers and while filling the questionnaire, measures were undertaken to ensure that the student teachers did not discuss among themselves.

Interview with the teacher educators were conducted individually depending on the availability of the teacher educators. Only those willing to be interviewed were selected for this purpose. The responses of the teacher educators were recorded on the interview schedule while they were responding.

Summary of Results

The results of the study have been presented in the following categories

(a) Teacher educators' classroom processes
(b) Student teachers' classroom processes
(c) Student teachers' feedback
(d) Teacher Educators' perceptions

Classroom Processes

Teacher educators from four different teacher education institutions were observed and a total of 216 observations were conducted. The behaviours of the teacher educators were recorded on the developed observation schedule. The summary of the findings are given below:

The proficiency of teacher educators in terms of knowledge adequacy was found to be 'above average'; majority of the teacher educators adopted lecture method, followed by discussion and demonstration. They rarely adopted seminar or other methods; the extent to which the teacher educators initiated their class was found to be 'below average'; majority (60 per cent) of them utilised support material while teaching. Close to one-fourth of them (23 per cent) did not utilise any support material while teaching; they extensively used textbooks or self-notes (37 per cent) during teaching and a small percentage (24 per cent) utilised other teaching aids like flash cards, real objects, apparatus and relevant documents. Teaching aids like charts, OHP, LCD projector and computers were rarely used; the teacher educators rarely facilitated student teachers to participate while teaching and seldom established linkages of the subjects they taught with other subjects or social context. This implied that they adopted unidisciplinary approach rather than multidisciplinary approach while teaching; a little more than 50 per cent (54 per cent) of the teacher educators provided examples while teaching; the scope of the content taught by majority of the teacher educators (79 per cent) rarely went beyond the subject being taught, they confined to the content given in the textbooks; the frequency

of the questions raised by the teacher educators lied mostly in the range of 1 to 10 questions in a class (37 per cent). However, the number of questions ranged from 11 to 20 in more than quarter (27 per cent) of the observed classes. Among the total observations conducted, 18 per cent of the teacher educators did not raise any question in the class; they largely (42 per cent) asked close-ended questions while 26 per cent raised open ended questions. These questions were commonly spread over 1 to 15 students in a class; by and large the number of student teachers who responded to the questions raised by the teacher educators in the classrooms (62 per cent) varied in the range 1-5; in majority (76 per cent) of the classes, no queries or questions were raised by the student teachers in the classes; the extent of interaction between the teacher educator and student teachers was found to be high in majority (49 per cent) of the classes. The average mean score was 3.27, indicating 'above average' interaction; the interaction within the peer group was found to be low in 50 per cent of the observed classrooms; in Majority (54 per cent) of the observations, the teacher educators displayed confidence while teaching; the teacher educators were by and large found to be self-motivated in most (63 per cent) of the classes; the audibility of the teacher educators' voice was found to be 'above average'; little more than one-fourth (26 per cent) of the teacher educators did not utilise the blackboard while teaching. Among those who utilised, a majority (53 per cent) used for writing illustrations and keyboards and less than one-tenth used for writing statements (7 per cent), drawing charts (4 per cent) or maps (one per cent); the teacher educators seemed efficient in maintaining eye contact with the student teachers; with regard to physical space, it is seen that majority (60 per cent) of the teacher educators preferred to remain confined to their chair or table while teaching; majority (63 per cent) of the teacher educators were efficient in using gestures and voice modulation while teaching in their classrooms; in general, while teaching it was seen that the teacher educators obtained feedback from the student teachers by asking questions (35 per cent), or giving home work (1 one per cent), writing assignment (2 per cent) or asking them to perform (5 per cent) and the overall performance of majority (71 per cent) of the teacher educators in their classrooms was found to be 'above average'. The performance of few teacher educators (4 per cent) was rated as 'high'.

Practice Teaching Processes

A total of 294 observations were conducted and summary of the findings are given below:

Fifty per cent of the student teachers had shown 'above average' ability in subject knowledge and the remaining were 'below average'; the student teachers commonly adopted lecture method (36 per cent) while teaching in schools and close to one-fourth (17 per cent) adopted lecture cum demonstration method. Less than one-fifth (8 per cent) adopted demonstration and text reading with questioning during their practice teaching lessons in schools. The techniques rarely adopted by student teachers were narration, games, dramatisation, questioning and discussion; it was seen that majority (53 per cent) were not successful in initiating the class, while 39 per cent were able to initiate interest, curiosity and gain attention of the students during class initiation; more than three-fourth (86 per cent) of the student teachers utilised teaching aids during practice teaching. Teaching aids in the form of pictures (43 per cent), and charts (35 per cent) were largely used by the student teachers. Less than 10 per cent utilised aids like maps, models and flash cards; it was seen that close to half the percentage (49 per cent) of the student teachers received 'above average' rating for the appropriateness of teaching aids; one-third (34 per cent) of them were able to facilitate interaction and learning while teaching; only 12 per cent of student teachers were able to establish inter-linkage of the content they taught to other subjects or real life situations; 73 per cent of student teachers did not provide any illustrations while they taught; majority (84 per cent) of the student teachers confined their content to those prescribed in the textbooks and only a small percentage (13 per cent) made an effort to teach content beyond the textbook; most of the student teachers (87 per cent) asked close-ended questions, and the least asked open-ended (one per cent) and probing questions (4 per cent); in none of the practice teaching classes, queries were raised by the students to the student teachers; the interaction between the school students and student teachers was 'below average' or 'low' in majority (57 per cent) of the classes and in 39 per cent of the classes 'above average' performance was noticed. Such interaction was 'high' only in one per cent of the classes; the interaction between the

students themselves within the classroom was 'below average'; nearly half the percentage of the student teachers had shown 'above average' or 'high' level of confidence; 37 per cent showed 'below average' motivation to teach, while 52 per cent showed 'above average' or high level of self-motivation; majority of the student teachers were not fluent in the language; the ability to explain concepts was also found to be 'below average' among them; the student teachers largely utilised the blackboard for writing keywords (76 per cent) and illustrations (20 per cent). Very few wrote statements, or drew diagrams on the blackboard; most (56 per cent) of them were able to maintain a distributive eye contact with the students in the class; majority (82 per cent) of the student teachers preferred to confine to limited physical space while teaching. In other words, the student teachers hardly moved around while they taught; most (55 per cent) of them had 'below average' skills related to gestures and voice modulation and they commonly evaluated the students learning after completion of the lesson through several methods viz., by asking questions, fill in the blanks, match the following or solve the given examples.

Student Teachers' Feedback

The student teachers were moderately satisfied with regard to the following aspects in teacher education programme: Teaching techniques adopted by teacher educators; teaching aids utilised by the teacher educators while teaching; whole Examination system; theory test-marking system; practical report-marking system; feedback after practice lesson; theory teaching conducted in college; practical work/input given in college; admission procedure adopted; college facilities - ICT, science lab, Classrooms and College uniform.

Majority of the student teachers opined that the content taught during the D. Ed programme could 'often' or 'always' be applied in school situations; according to the student teachers, among the different teaching techniques taught in the D. Ed programme, methods like discussion, self-study and play-way method could be adopted 'often' in schools, while the rest could only be adopted 'sometimes'.

The student teachers experiences with respect to the following were not satisfactory: Allotment of class for practice teaching; carrying teaching aids to the practice schools and transport facility from home to practice schools

Teacher Educators' Perceptions

The perception of teacher educators was diverse and this varied within and between the teacher education institutions. The variations were related to selected features like the appropriate classroom size, entry qualification, subjects to be taught and the whole programme framework. On the whole, the teacher educators were in favour of revising the curriculum of the prevailing elementary teacher education and insisted that the theory taught should be related to the social context, the work load of the student teachers should be reduced, practical activities should also be lesser in number and ultimately the programme should be based on realistic principles.

Discussion of the DTE

The curriculum of the Diploma in Teacher education adopted by the elementary teacher education institutions in Maharashtra is found to be well structured and clearly specified the weightage of each subject in terms of written marks, practical marks and weekly periods to be conducted for the same. In general all the D. Ed teacher education institutions adopted a common schedule wherein for every subject, the theory teaching is first completed and then practical inputs are followed by. In the present study four teacher education institutions were observed among which two were urban, one rural and one semi-urban, and with regard to medium of instruction, two were English medium and the rest two were Marathi medium. The classroom size of the students enrolled in this programme varied from 12 to 93 and the average class size was 36.91. The following issues have emerged from the results and have been discussed in detail in the report:

(a) Curriculum distinct from school realities
(b) Ongoing process
    (i) Teacher educators: Confident and interacted
    (ii) Lectures predominant in classrooms
    (iii) Less efforts to bridge theory and practice
    (iv) Absence of content flexibility
    (v) Limited participation of student teachers
(c) Practice Teaching process
    (i) Difficulties with practice schools
    (ii) Difficulty in class management
    (iii) Commuting to practice schools
    (iv) Prevalent disparities
    (v) Inadequacies – Knowledge, communication and interactivity

(d) Student Teachers' feedback- Demands
  (i) Efficient teacher educators
  (ii) Adequate Institutional facilities
  (iii) More individual guidance
  (iv) Balance between theory and practical
(e) Teacher Educators' perceptions
  (i) Disparities within teacher educators
  (ii) Recommendations
(f) Benefits of this programme

Conclusion

The existing elementary teacher education programme has both its strengths and weakness. Some of the good aspects of the programme are that selected inputs are meticulously planned and implemented, especially those related to practice of micro-teaching skills and conducting school teaching practice programme. In spite of the various hurdles faced by the teacher educators to identify appropriate schools for practice teaching, sincere efforts are made to structure the timetable for practice teaching by allotting required teaching time periods for each student teacher. Yet it is important to know that the nature of classroom transactions or teaching-learning process taking place both in the colleges and the practicing school situation need improvement.

The study submits a conclusion that performance of the students teachers were largely reflections of their teacher educators, thus indicating that proficiency of student teachers is dependent on the proficiency of the teacher educators. Hence, to improve the effectiveness of teacher education programmes, there is a need to first enhance the efficiency of their teacher educators especially in the areas related to communication skills, interlinking theory to practice, facilitating student teachers participation, adopting interactive teaching learning methods and facilitating constructive methods in their classrooms. For this purpose, intensive capacity building programmes for teacher educators should be conducted to enable them to unlearn traditional practices and relearn new approaches like constructive and collaborative, to enhance the quality performance of teachers in the State.

Book Review

PPP Paradox: Promise and Perils of Public-Private Partnership in Education

by Pritha Gopalan

Published by Sage Publications, New Delhi, 2013
Price ₹ 495, **Pages** 152

Reform in education is a constant endeavour. Introduction of PPP in education is being seen as one of the most desirable reforms when there are issues related with widening the reach and addressing the quality. The XI Five Year Plan of the Government of India records the benefits of PPP in education at many places in its document, thus encouraging the relevant initiatives. However, there is also certain skepticism at various quarters attached with it as far as education, at least the school education, is primarily considered a Government's responsibility and the private sector is known for its leanings towards profits. In this context the book has come up very timely on this subject, very aptly dealing with the difference between privatisation and partnership, as mixing the two together may lead to misconceptions. Further, while advocating in favour of PPP, the author is cautious that 'social/public' nature of educating people is not threatened. In her own words "While I argue for the PPP, I maintain a critical stance throughout the book and am careful to enumerate the pitfalls and challenges that line the path of partnerships in education.... I argue that promise outweighs the perils."

First chapter of the book titled 'The Paradox' is about the emerging concept of PPPs in education. It addresses the contradiction where entry of a partner (Private) is suspected to change the 'social cause' i.e. 'educational improvement'. It is a well researched chapter, taking into its fold various forms of PPPs and puts forth arguments with respect to different forms. These are analysed in detail under Promise and Perils (Chapter 2), paying attention to specific issues such as their scope and motive. The author opines that different private partners bring with them different set of motives, skills, experience etc. affecting the partnership and therefore, should not be viewed as homogenous entity.

The working of PPPs is examined under four categories i.e.

Scope: focused or systemic; Scale: experimental or policy driven; Method: takeover or complimentary; and Motive: profit or social. If any of these is designed to serve a cause other than educational improvement, the partnership deviates from the goal. Thus, these could serve as bases to assess the success of the partnership. Author has given numerous examples from different parts of the world to support and validate her argument on the value of PPPs in education. But in fact, it widens the field even more for discussion.

Chapter three of the book titled 'Middle Start in American Public Schools' is a case study which discusses the evolution of systemic reform from where the private partnership emerges in the field of education. The revolution began in America's public schools situated in Michigan where in 1994 an initiative was taken to uplift the 12 low performing schools in rural and urban areas. The partnership involves two private organisations based in the US to improve the performance of these schools. A comprehensive school reform (CSR) programme had been launched in order to improve the performance of low-grading school in US. Slowly and gradually it gained support of educators and legislators in US, as it was moving the performance indicator of schools upwards charismatically.

Fourth chapter of the book, another case study, titled 'Montessori in Chennai schools' is an Indian example of bringing change in the running and functioning of schools in Chennai through PPP. First time ever, the Montessori Method was launched as a pilot in the Kindergarten classrooms in Chennai corporation schools in partnership with a non-profit organisation. Montessori Method advocates that learning is an innate part of child development and education enhances this process. Based on this, a Montessori teacher sits beside children, observes them quietly and guides them as per need. Sometimes teacher works with children giving them analytical activities to make them understand more complex concepts. The project is reported to successfully revitalise the teaching-learning process and enjoyed support from various stake-holders. This process has completely changed the teaching-learning process. The chapter contains numerous examples of the improved child performance because of this method. The project, however, is yet in its infancy, yet it has been reported to have won considerable support.

Fifth chapter titled 'Resolving the Paradox' focuses on the implications of the case studies which author has taken for the educational quality, scale and sustainability. The author attempts

to connect PSPs and social enterprise framework provided by the European movement to education. The author has discussed the challenges and issue which are confronted in running these partnerships.

Overall the book gives a balanced picture of PPP in education. With two case studies, the book attempts to showcase its successful implementation and demonstrates the potential of such partnerships in meeting the goals. It also offers good critical analyses of various complex issues related with participation of private partners, including replicating of such efforts. It is written in a way that is interesting to the reader. Reasonably priced at Rs 495, it is within reach of all and is a useful one for all those keen to understand the nuances of PPP in education.

Poonam Agrawal
Professor
Division of Educational Research
NCERT, New Delhi 110016

and

Abhishek Singh
Junior Project Fellow
Division of Educational Research
NCERT, New Delhi 110016

Action Research in Education: Learning Through Practitioner Enquiry (IInd Edition)

by Vivienne Baumfield, Elaine Hall and Kate Wall

Published by Sage Publication, New Delhi, 2013
Price £ 23.99, **Pages** 169

The book under review "Action Research in Education" is a professional book to find out more about the process of enquiry in the professional practice of teachers. The price of the book (₹ 2400 soft bind) is slightly higher for a reader to purchase. The IInd edition of the book contains wider range of real life case studies and composite examples drawn from teaching practice. In today's scenario it is evident that research by practitioner is an essential activity and it is increasing day by day for improvement in their practical life. The book gives advices to make research more fruitful and sophisticated. Every chapter of this book contains separate bibliography, which would help new researcher to go through the further references. Index given at the end of the book is very helpful for quick search of the desired concept.

The first chapter of the book 'Understanding practitioner enquiry' discusses the whole idea about enquiry or what can practitioner learn across different contexts of enquiry. A case study is also illustrated for better understanding of the concept of Action Research. Importance of enquiry in the process of Action Research is defined. The authors have tried to establish linkages between reflection enquiry and Action research through a graphical representation. A model of dynamics of practitioner research has also shown through a figure.

In chapter two of the book 'Ways of being a practitioner enquirer: beliefs, ethics and practice' describes the importance of examining the fundamental ideas of Action Research and assumptions that forms a teacher and shapes the enquiry. Ethics in research is been given utmost importance in the chapter. It is focused that quality of enquiry is important but it will be much higher if there is more stout and ethical awareness in it. Ethics in respect for the person, knowledge, democratic value, quality of educational research, academic freedom and all these are described through different case studies. The way the results need to be reported is explained by the authors.

In chapter three 'How to do a practitioner enquiry: finding and refining a question'. The chapter focuses on how can the best question be made up or how can a good enquiry question can be made up. It also focuses on checking out how valid and rigorous question is to be designed by the practitioner with respect to what others have done to ensure a realistic question.

The next chapter entitled 'How to do a practitioner enquiry: deciding on an approach and complementary methods' guides the process of finding an approach that matches question and would be able to generate evidence and how it could be collected and what best answers the researchers question. This chapter also focuses on how collected data are able to convince skeptical colleague with manageability and evidence. A quote of a teacher is also given in the chapter, who has done Action research and how they convince their skeptical colleague from data collected. Hence the chapter focuses on type of data collection techniques and how to make data appear more authentic. Visual data triangulation across evidence source and on mixed method model, its analysis and process are illustrated clearly.

The chapter five 'Taking account of learners' perspectives in your Enquiry' explore the different evident sources that can be used to investigate learners' in some way as a part of our enquiry. It helps to know the different methods that are used and the issues and considerations that are important when researching learners' perspectives. It helps in enquiring the questions viz. how can we change the way, we look at what is happening in our context, and what might our learners have to tell us? How can we incorporate a range of voices in our enquiry?

Chapter six entitled 'Exploring your own and your colleagues' professional knowledge' talks about what do teachers know about their areas of knowledge and practice? What they want to know about their practice. The chapter describes two broad types of investigations teacher might undertake depending upon their initial approach on Action Research is focused or exploratory i.e. what's going on….? And what happened if…? The various tools for exploring what's happening viz. Diaries, research logs, Audio/Video taping, and observation etc. The authors had given the examples of primary, secondary and higher education level.

Chapter seven named 'Engaging with the views of families and the wider community' is very important because it focuses

the assessment of data beyond the four walls of the school. It suggests how to collect data from parents other family members and community. It also describes how to organise and validate this data for Action Research.

Chapter eight 'Making sense of it, making connections and bringing it together' focuses on how to make sense of the data collected by the researcher, establishing linkages between various investigations and how to approach for analysis.

Chapter nine 'Sharing your findings, finding new questions' is the concluding chapter of the book which talks for who needs to know about your enquiry and how can you share your findings it explains very explicitly the method for sharing practitioners enquiry.

Overall the book is very helpful for the practitioner to understand the concept and process of Action Research in Education. Also the teachers will be able to conduct small research studies using Action Research methods. This book is for anyone who wants to find out more about the process of undertaking an enquiry into their professional practice at any stage in their career.

Rajendra Pal
Associate Professor
Division of Educational Research
NCERT, New Delhi 110016

and

Sakshi Gupta
Junior Project Fellow
Division of Educational Research
NCERT, New Delhi 110016

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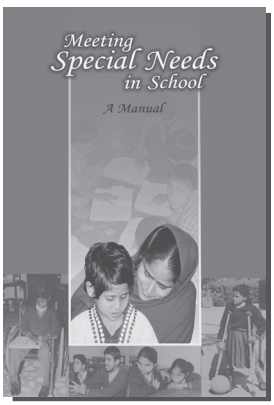

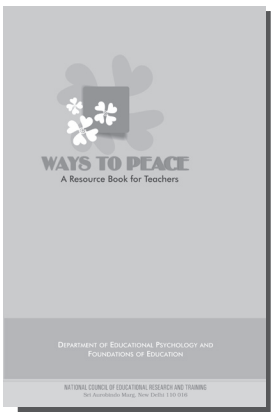

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