

**CERTIFICATE PROGRAMME  
IN  
FOUNDATIONS OF EDUCATION**

**WORKSHOP II  
FEBRUARY 3 -14, 2008**

**B R I E F R E P O R T**

**DIGANTAR**

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The second workshop of the Certificate Programme in the Foundations of Education was organized by *Digantar* on its campus in Jaipur from February 3 to February 14, 2008. This was a workshop in the third series of this Programme and 23 participants took part in it.

### **The Thrust and the Setting**

The workshop had a two-fold thrust: first, to evolve an understanding on the theory of knowledge and its relation with the curriculum; second, to move towards a conceptualisation of the pedagogy of various areas of “knowledge”, specifically the areas of Science, and Language. Consequently, the workshop covered the areas of *Human Understanding and Curricula*, *Nature and Pedagogy of Science*, and *Nature and Pedagogy of Language*.

The second workshop set off from where the first had reached: the *Human Understanding and Curricula* segment was a continuum of the philosophical perspective on education that was covered in the first workshop, and it further broadened and deepened the philosophical base of the process of comprehending what education is all about; the segments on the *Nature and Pedagogy of Science*, and of *Language* gave a specific context to this conceptual framework of understanding.

### **(A.) Human Understanding and Curricula**

Resource Person : Mr. Rohit Dhankar

The workshop began with the *Human Understanding and Curricula* segment. There was a brief revisit of what had been covered in the first workshop in terms of understanding the various aspects of Education - the *Foundational Areas*, the *Curriculum Core*, and the *Curriculum Details*.

I. At the outset, a small exercise was taken up in terms of collectively discussing what the participants would *like to have* and *what not to have* in the **Environmental Science curriculum for Class V**, also in the process discussing the *basis for inclusion or exclusion* of a topic / area of study in the curriculum : the reasons for inclusion and exclusion, it was felt, could be psychological as well as socio-political and ethical. It was, however, underlined that primacy should be accorded to epistemological grounds based on a theory of learning and knowledge to take decisions on such issues.

It emerged from the discussions that Environmental Science is a very wide-ranging term and needs to be well-defined.

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II. An attempt was then made to get to the root of the question : **what is knowledge and what are the processes related to it?** Four questions were worked on :

What is knowledge ? (developing a definition of knowledge).

Are there more than one types of knowledge ?

How do we come in possession of knowledge ?

How do we know the truth for our knowledge? (What is truth? What does it mean to call something true ?).

In the process of working on these questions, terms like *cognition, perception, experience, awareness, fact, truth, belief, judgment, information, understanding* were discussed, defined and brought within the domain of comprehension. While discussing these terms as factors that go into the building of what is called 'knowledge', it came to be realized that defining 'knowledge' on the conceptual plane is not so very easy ; still, it is important to define it, for knowledge is the "centre-piece" of education. In terms of the *types of knowledge*, **knowledge by acquaintance** (knowing something through direct contact), **knowledge how to ...** (involving skills like riding a bike or driving a car), and **knowledge that ...** (that, for example, there is a tree outside) were discussed.

III. The question of 'what is knowledge' encompasses within itself an understanding of 'reality'. **Bertrand Russell's *Appearance and Reality* ( Chapter I of his book *Problems of Philosophy*)** was taken up for **Presentation** by one of the participants. The excerpt centres round the themes of existence of reality and knowability of reality. Whatever we see, feel, hear, sense is what we *think* is real. Russell focuses his attention on a table to prove his point - from the point of view of *touch, texture, shape* of the table : the table, when looked at by different persons from different points of view, even if at the same moment, will look different to each one of them, giving rise to the question - "Which of these is the 'real' table?" Each of us would have a different view of the table with its various characteristics, and we cannot really come to a conclusion as to which of these is *the* table - as also what *is* the table. Russell also brings into focus the mind-matter dichotomy discussed by various philosophers (especially of the idealist school of thought) like Berkeley and Leibniz. The question remains - even if there *is* a reality outside, can we really know its true nature?

Russell's piece was discussed and sought to be understood in a three-fold context - (i) when we try to understand the issue of knowledge, it becomes important to decide as to *what knowledge to have and what not* ; (ii) CERTAINTY of knowledge is not easy to achieve ; (iii) the piece also led to the insight that if the reality of such a simple thing as a table is so complex, then there is a need to look at the simplified, "given" conceptions of knowledge. Also that there might be multiple truths in the sense of the

world being viewed from different and differing perspectives. The group work that was to come ahead reinforced this idea for the participants.

**IV. Getting to the root of knowledge-acquisition** : Having worked on what knowledge is, as a precursor to an understanding of the various *concepts of knowledge* and of R.F.Dearden's chapter *Learning and Experience* from his book *The Philosophy of Primary Education*, the participants worked in groups on a set of statements, the purpose being to try and understand the *process* of "learning", of getting to the root of knowledge.

EIGHT STATEMENTS (*some deliberately wrong*) were framed for **four groups to work on**, each group taking up TWO statements. These statements were :

1. God made human beings to worship Him.
2. We have no way of knowing the truth of any of these statements.
3. A rose is more beautiful than a marigold. ( Aesthetics)
4. One should never harm others. ( Ethics)
5. Kalidasa was a poet in Harshvardhan's court. (History)
6. Karanataka's women are more empowered than their counterparts in Rajasthan. (Social Sciences)
7. The earth does not rotate on its axis. (Physics/ Geography)
8. The sum of all interior angles of a triangle is equal to two right angles. (Mathematics)

The participants were to work on two aspects :

- (i) How does one find out the truth of a statement?
- (ii) In this process, what would be the criteria / basis for justifying the truth or acceptability of the statement?

The exercise made the participants realize the rigour of the process : of defining, observing, collating information-data, reasoning ; realizing that an understanding of the process of acquiring knowledge and learning also includes verification and validation of procedures - and that this would *apply to various forms of knowledge in varying degree, depending upon the nature of the discipline concerned*. During the course of the presentations by the groups, there were extended discussions, arguments and propositions moving back and forth, throwing light on the intricacies of the processes involved in the validation and verification of the statements - also leading to insights into the nature of the statements and the disciplines of knowledge they fell into - History, Physics, Mathematics, Aesthetics etc.

**V.**This rigorous exercise in groups led on to **R.F.Dearden's *Forms of Understanding*** (excerpt from *The Philosophy of Primary Education*). The reading and discussion on it

served a dual purpose: this helped the participants realise the importance of the exercise that had been undertaken in groups - the chapter provided *conceptual validation* for the exercise - and also, to a certain extent, moved towards a rounding off of the discussion on knowledge. Reading and discussing Dearden made one realize that the group-work had very pointedly validated Dearden's statement - "a person should not simply think what others authoritatively tell him to think. He should either find out for himself, or at least be educated sufficiently to regard authorities as provisional only, and to form some estimate of the reasonableness of what he is told."

There was a considered attempt to arrive at an understanding of the issues raised in the chapter and their relevance for school education. The deliberations centred round the forms of knowledge and of human understanding, and the processes involved thereof : Dearden's views on the forms and structures of understanding Mathematics, Science, History, the Arts, Ethics and Religion, the methods of investigation and validation in these disciplines were discussed, quite a lot of time being spent on History and Religion. (The work on this segment was also important in view of the fact that this workshop - and the two that follow - would concentrate on the Nature and Pedagogy of various disciplines).

It was broadly agreed that all these aspects need also to be viewed in the context of the understanding that a child who is conversant with the concepts, procedures, and methods relevant to a subject, would be better able to gain in comprehension and capabilities in many ways.

VI. In this final leg of the Human Understanding and Curriculum part of the workshop, the presentation on Dearden's *Learning and Experience* brought out the **process of learning as it develops in a child on the basis of his experience and its relation to various forms of concept-formation**. The presentation brought out Dearden's idea of a *concept*, his categorisation of *perceptual concepts*, *practical concepts*, and *theoretical concepts*, and the points of differentiation between them. Dearden also links them up to the various forms of understanding, and talks about **the importance and role of language**. At places, the participants also heard echoes of Michael Oakeshott, Hamlyn and Russell's *Appearance and Reality* in this reading. It was recalled that Dearden was responding in a situation heavily influenced by the prevalent culture of rote learning and the traditional methods of authoritarian teaching in schools; he was advocating an altogether different view, presenting a critique of the child-centred approach, following which he gives his own conception of teaching.

**VII.**In the final stages of this segment of the workshop, there was a **discussion on the Taxonomy Table** – an aid in the **classification of various forms of knowledge**, a facilitating technique that could be used as a resource for the purpose of measuring a student’s ability, for evaluation and assessment. In terms of classification, the *knowledge dimension* can be classified into Factual, Conceptual, Procedural and Meta Cognitive forms of knowledge and, the *cognitive processes*, into those of remembering, understanding, applying, analyzing, evaluating and creating – these are the processes the student will go through in pursuit of the various classified forms of knowledge.

An exercise was undertaken on a collective basis to try and see how the process of this classification will work out when applied to a particular subject – history, for instance : how, under the Major Types and Subtypes of the Knowledge Dimension, i.e. *the content* of the taxonomy table, the four domains of knowledge (Factual, Conceptual, Procedural and Meta Cognitive) will be fixed within the sphere of the subject concerned. Thereafter, this exercise was taken up for *the process* part of knowledge (remember, understand, apply, analyze, evaluate and create).

It was also realized that an awareness of the categories in the Taxonomy Table can help sensitize us to the requirements of curriculum-framing, keeping in mind the various kinds of cognitive processes involved in forms of understanding and knowledge. It would be important to use it *intelligently* in a manner *commensurate with the requirements at hand*.

**Two more issues** were taken up in this workshop as carry-overs from the last one. First, a **presentation on and discussion of an excerpt from D.W.Hamlyn’s work *Perception, Learning and the Self***. This very nicely dovetailed with the perspective on knowledge. The excerpt covers *four broad aspects* : what learning is, how it is related to knowledge, how it gets started, and the difference between early and later learning. The presentation very competently brought into focus Hamlyn’s critique of the Chomskian position within the Rationalist perspective, and of the Empiricist view that takes the child to be a blank sheet receiving sense impressions, passive and being acted upon. Thereafter came an exposition of *Hamlyn’s view* that a “person is a social being from childhood, and the knowledge that he has to acquire is equally socially determined in an important sense” – and of how the child is initiated into the way of a shared life as (s)he embarks on the path of learning and knowledge.

The *implications*, for education, of this concept of learning were brought out in the presentation : the contextual significance of questions like what learning, under what circumstances, and for what purpose becomes important, and one is also led to the

realization that precise theories of learning are not quite possible – it is a question of reaching better theories with lesser assumptions.

The **second issue** was related to the Aims of Education. The aims, as enunciated in the National Curriculum Framework 2005, had been discussed during the previous workshop. Now, there was a **presentation and discussion** on the Paper of the prominent British educationist and academician **Prof. John White - New Aims for a New National Curriculum**. The Paper addresses an important issue – *who should decide the aims of education in a democracy, and by what methods? – and also discusses ways and means of avoiding what Prof. White calls “sectionalism”* (the tendency of a particular group to disproportionately influence decisions in the course of the framing of curricular aims). In the ultimate analysis, the Paper comes to suggest that given the fact that the democratic set-up has the sanction of people at large, *attachment to democratic principles should form the basis of coming to a consensus on the aims of education: the “aims of a national education system” should be generated from the values of political equality, personal autonomy, liberty, civic concern for the well-being of others and the “derivative democratic value” of knowledge. The direction to be taken in this journey would be “from a commitment to democracy, to its underlying values, to general aims of education, to more specific curriculum objectives”*. The Paper also relates Aims to *attitudes and dispositions* that should be fostered in children by parents and the school, involving a process of education of the emotions (learning how to regulate their emotional life, so that it supports everyone’s well-being). Education should also open up an array of options for the child’s growth, and enable her to choose a path of what Prof. White calls “self-directedness” (choosing one’s goals and relationships autonomously rather than conform to custom or authority).

## **B.) Nature and Pedagogy of Science**

Resource Person: Vijaya Varma, Professor (Retd.), Department of Physics,  
University of Delhi

**I. THE PRELIMINARIES** : An important aspect of this second workshop was concentration on specific areas of education - **Nature and Pedagogy of Science** was the first area to be focused on. *Five main aspects* were proposed to be worked on in this area :

**1.Experimentation**: The centrality of experimentation in science. The contribution of Galileo in developing the scientific method and bringing out the significance of experimentation.

**2.The Scientific Method**: What it is, its different formulations.

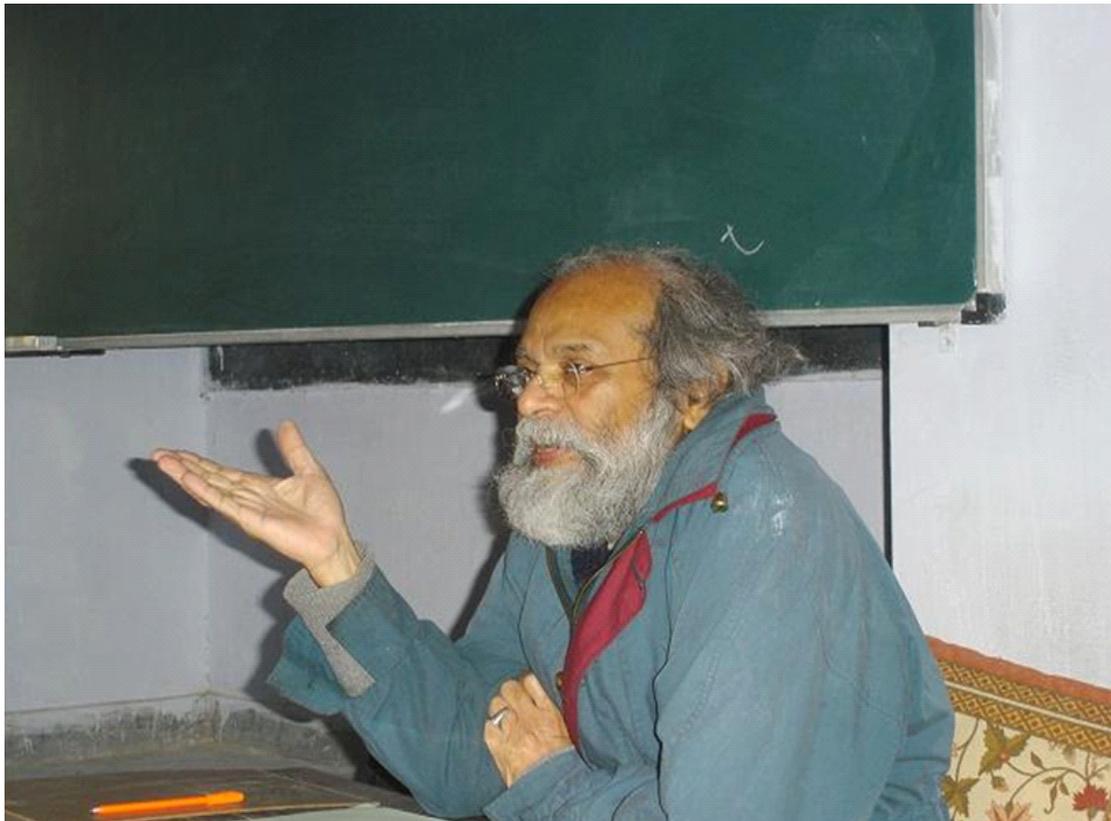
**3. School Science in India**: Its condition and its problems. Experiences and a critique of the Hoshangabad Science Teaching Programme.

**4.Science Curriculum:** Designing a school science curriculum. What should it look like?

**5.Evaluation:** Its role in determining classroom practices. How objective are objective tests? And how accurate?

II. Work on the *Nature and Pedagogy of Science* began with the Resource Person's introduction of **Galileo and his contribution**. Galileo was the first person to systematically study motion, experiment with the pendulum, also to discuss the significance of errors in scientific observations, and emphasise the role of *experimentation* as opposed to mere *observation* in scientific development. With Galileo came the realization that in experimentation resides the spirit of science.

To understand the significance of the statement that experimentation is at the heart of all science, the participants were actually made to perform an **experiment on the**



**pendulum. Eight groups, with three participants in each,** worked on the experiment of measuring the time taken by a pendulum-bob to complete 10 oscillations for 7 different lengths of the pendulum (ranging from 30 cm to 90 cm) by displacing the string through an angle of nearly 20 degrees and releasing the pendulum, taking five (5) readings at each length, and calculating the average time period of the pendulum at each of the specified lengths. The readings were plotted

on a graph, and from such graphs participants were required to find the **length of a pendulum whose time period is exactly 2 seconds.**

The experience made the participants realize how interesting the process of experimentation can be – and that it is not merely a chore. The minor variations in the results obtained by the various groups registered **the role of error** in such experiments – errors that could be random or systematic. It was thus realized that the occurrence of error during experimentation is unavoidable. This also led to the realization why theories in science should be viewed as *approximations to the truth*, and not as ideal and perfect; and how the *process rather than the end result* is of the essence in understanding the real worth of experimentation; how even though precision is important, errors caused by confounding variables have to be taken account of.

In continuation of and in consonance with the experiment on the pendulum, the participants were required to fill up a **response-sheet** consisting of three questions based on diagrams, and related to the movement of the pendulum. It was interesting to note that almost all the participants, a large majority of them from a non-science background, were able to answer the first question correctly. However, just eight of them were able to give the correct answer to the second question and three, to the third. **The exercise made all realize the role of misconceptions and the fact that the education they had received in science had not left a permanent positive imprint on their minds.**

### **III. The Philosophical Perspective on Science: Acquaintance with theories**

Experimentation in science is supposed to lead on to the formulation of theories and concepts; the next step, therefore, was to discuss aspects related to theorizing. Three philosophical scenarios - Karl Popper's *Theory of Falsification* ; *Theories as Structures* : *Kuhn's Paradigms* ; and *Feyerabend's Anarchistic Theory of Knowledge* – were taken up. These were readings from *What is This Thing Called Science: An Assessment of the Nature and Status of Science and Its Methods* by Alan F. Chalmers

The presentations were preceded by a brief introductory session by the resource person, providing a setting for what was to follow. The question to be pondered was - *How reliable and certain is Science as a body of knowledge?* How does one construct a theory on the basis of observation and experimentation involving limited data, and given the awareness of the possibility of false correlations between things? What is the certainty that the knowledge being generated is certain?

**Detailed presentations**, marked by the active involvement of the participants in terms of detailed discussions on the issues raised, followed. This began with **Karl Popper's theory** based on the concepts of falsification, falsifiability, degree of falsification, and falsificationism – according to which only theories that are potentially falsifiable and yet resist falsification are scientific theories; and the task of a scientist is not to prove a theory to be correct but to explore the limits of the applicability of any given theory - the theory will be considered useful depending on its predictive powers TILL IT IS FALSIFIED.

The presentation on **Thomas Kuhn's Theory of Paradigm Shifts** that came as a reaction to Popper's theory brought out its essence in terms of **shifts taking place from one paradigm to another** in the course of the progress of science. Also, the major contrast with the falsificationist scheme of things was highlighted : in the Popperian scheme of things just one failure would be enough for the paradigm to be abandoned - this single instance would be taken to be an adequate justification for falsification of the theory; Kuhn, on the other hand, recognises that difficulties and anomalies are a part of the game. There would have to be a justifiably large number of anomalies for the paradigm to be abandoned; an anomaly would be considered to be serious enough if it was seen to be striking at the *very fundamentals* of a paradigm; and it will also be important to see how long the anomaly persisted. Once, however, it is evidentially clear that there is no escape from the crisis, there comes about a paradigmatic shift. Quite some time was also spent during the deliberations on the **almost exclusive emphasis by Kuhn on sociological factors in terms of being the cause for the rejection of one paradigm and shift to another**, Chalmers' statement that "Kuhn compares scientific revolutions to political revolutions", and whether this emphasis by Kuhn is really justifiable.

Thereafter followed a presentation on the enigmatic **Paul Feyerabend and his Anarchistic Theory of Knowledge** that, in essence, **negates methodology**. Feyerabend argues that "none of the descriptions of the methods of science that had been proposed till then were complete", and tries to show "how these descriptions are incompatible with the history of physics", how they "have failed to provide rules adequate for guiding the activities of scientists."

This reading was a tough nut to crack for the participants and they were ready to admit this; Feyerabend was, in fact, incomprehensible to most.

A question was raised – why include a writer like Feyerabend in the readings? The answer: when we talk of the scientific method, one also needs to be aware of Feyerabend's position that argues against method. Moreover, he is a writer who, even though controversial, can't be ignored.

**SUMMING UP** : At the end of this exercise, the participants were able to appreciate that Science

i) does not claim that its methods could lead to a FINAL truth but only that one could progressively get to models that describe physical reality better and better by a process of successive APPROXIMATIONS;

ii) takes the MORE ACCURATE theory (that which gave a closer correspondence to observations) more seriously; and

iii) strives for BETTER descriptions of physical phenomena.

#### **IV. Hoshangabad Science Teaching Programme (HSTP)**

Following upon developing an understanding of the importance of experimentation in science, and acquaintance with the philosophical perspective on science in terms of theoretical constructs, the next step was to come to terms with the *pedagogy of science*: this would, in some ways, imply an understanding of how it is *being taught* and how it *should be taught*. The participants were exposed to the experiences of the inspiring Hoshangabad Science Teaching Programme that began in the early 1970s in Madhya Pradesh. The Resource Person's exposition came as a mirror to what is happening in formal education (especially the state of Science teaching in our schools characterised by an utter lack of a culture of experimentation) and the structural constraints that a programme such as HSTP is faced with, also giving an idea of what is possible to be done within those constraints and what is the level of effort involved in the whole attempt.

The Resource Person brought alive the initial years of HSTP, its problems and struggles, the energy that went into making it all come true, its socio-cultural impact and the lessons learnt from the experience. The sessions were punctuated by the active involvement of the participants in the proceedings by way of interventions for clarifications and, on one occasion, themselves participating in an experiment that was a part of the Hoshangabad programme.

**V. MOVING TOWARDS A SCIENCE CURRICULUM** :With the philosophical basis of the methods of science and the concrete experience of a science teaching programme like HSTP in place, it was appropriate to ask - how does one go about designing a curriculum in science?

If one accepts the imperative of experimentation being at the centre of the scheme of things in science teaching in schools, there are **certain implied requirements to be fulfilled in the course of formulating a suitable curriculum** in consonance with this basic belief. These requirements were identified as (i) A Suitable Set of Experiments

around Themes (ii) Equipment and its Viability (iii) The Teacher and his Training (iv) Focus on the Process rather than the Products of Science (v) Interface between Science and Society (vi) Scientific and Technological Literacy (vii) Miscellaneous issues like health and hygiene, nuclear energy and global warming.

**VI. THE CURRICULAR FRAMEWORK FOR SCIENCE: CONCLUSIONS** - On the basis of the deliberations the following conclusions were reached on the question of curricular framework for Science :

# Emphasis on experimentation, especially till the stage of middle school; thereafter, emphasis on this component could be reduced, and greater attention paid to conceptual and theoretical aspects.

# As a corollary to the first point, a purely academic approach to science should be discouraged till the senior secondary stage.

# Attempts be made to find space for questions, investigations and discussions at the science-society interface within the ambit of the curriculum.

# Given the diversity of situations in our country, it would be desirable if the criteria for what to teach and not teach, what to do and not do are decided upon on the basis of local relevance in terms of availability of material and feasibility for experimentation. This would also mean that there might well be no standard textbooks to be prescribed across the whole of the country - the curricular framework would leave scope for variations.

**VII. EVALUATION :** The last session of the *Nature and Pedagogy of Science* dealt with *Evaluation*. Through an exposition on the "objectivity of objective tests", attention was drawn to the possibility of pitfalls in the system of evaluation in terms of grading - and the necessity to be careful in devising systems of evaluation. The impression one has of such tests is that they are very "objective" - no scope for subjectivity, and therefore the results do justice to the candidates. It was, however, illustrated by the Resource Person how this sense of fairness is shattered once even a cursory investigation is undertaken. What normally happens in such examinations is that from amongst the enormously large number of candidates (say, 60,000), very few (say, 1000) are selected. Quite often many candidates are bunched together at the same rank and how to desegregate such bunching at cut-off is a huge problem.

The pertinent question: is this system of examination and evaluation foolproof and fair in selecting the successful candidates? How robust is the procedure and how free of 'noise' is it?

## C.) Nature and Pedagogy of Language

Resource Persons: Prof. Ramakant Agnihotri, Department of Linguistics, Delhi University, Delhi.

Ms. Vijaya Srivastava, Central Institute of English and Foreign Languages (CIEFL), Hyderabad.

This segment of the workshop involved an exploration into the nature of language, and, in the process, also opened up possibilities for gaining insights into the pedagogy of language. **Prof. Ramakant Agnihotri** took the participants on a journey of discovery that proved to be a real eye-opener, revealing to them secrets of language that seemed till then to have been locked beyond reach. His opening session began with the question : what sort of understanding do we have of the child, and of language? And, what are the implications of the nature and structure of language for pedagogy and classroom interaction?

As a run-up to the real thing, there was an **interactive exchange of views** centring round what the participants thought of “language” - what image the word evokes in the mind. Reactions ranged from characterizing it as being a mode of communication,

to being a means to thought and concept-formation, and an aid in the articulation of experiences. Is there, then, something that is independent of language, something that has to be understood before we can come to the crux of the matter? It was decided to embark on



the journey of trying to understand what Language really is : and so, before trying to understand the ‘HOW of X’, it was decided to try and get to know the ‘WHAT of X’.

**GROUP WORK I:** In order to understand the WHAT of X, the participants were asked to work on **three tasks** related to the STRUCTURE of language - an extremely well-organized, rich and complex system of sounds, words, sentences, going up to the level of discourse. In order to understand this rich and complex system the following tasks were taken up by the participants in groups:

TASK I : Make a list of 20 to 40 words *in any language* – trying to make use of all languages known to the participants in a group – and write them down in ROMAN SCRIPT ( for example, ‘darvaazaa’ ).

TASK II : Find out words with the C<sub>1</sub>-C<sub>2</sub>-C<sub>3</sub>-C<sub>4</sub>-V structure [ i.e. four consonantal sounds followed by a vocalic (vowel) sound].

TASK III : Papa, Baba, Mama – can a 2-3 years’ old child speak such words? If yes, **what is it that the child knows to be able to distinguish between these words?**

Four groups worked on these tasks. About 30 languages were represented when the listing of the words for **TASK I** began: a total of around 100 words from Hindi, Urdu, Malayalam, Gujarati, Kannada, Panjabi, Oriya, Bhojpuri, Santhali – and many more languages – written in the Roman script. The exercise gave the participants an insight into the **relationship between script and language**. **Three major conclusions** were reached : (i)The stereotypical link that is usually tried to be established between language and script was broken by the exercise: it was established that there is *no given relationship* between the two. (ii) *All languages* – with minor modifications for practical purposes – can be written in any *one script*. (iii) *A language* can be written in *all scripts*. (Santhali, for instance, is written in 7 different scripts; Sanskrit is written in 14 different scripts). There are, the Resource Person informed the participants, thousands of languages in this world without a script.

In terms of **TASK II**, it was found that the participants had not been able to find even a single word with *four consonantal sounds followed by a vocalic sound* – not a single such word was found in the around 30 languages that were used in the groups ! They were able to find words with *three* consonantal sounds followed by a vocalic sound but came to realize that these words were not many and that they had a peculiarly specific structure. The words were such as *spring, sprout, sprint, splendour, splendid, splash, split, strike, struggle, stranger, strangle, screw etc.* It was noticed that they all began with the sa\ sound and this initial sound too combined with very limited sounds like प् र् क् . The participants were told that there were very very few – just the Slavic - languages that had words with the structure of four consonantal sounds followed by a vocalic sound.

This exercise very pertinently registered the fact that (i) the structure of human language is defined by the *alternation* and sequence of consonantal and vocalic sounds : 98% of the words will conform to the alternation of consonantal and vocalic sounds – the C-V-C-V structure; (ii) the absolutely essential element in a word is the vowel : the potential of a word is in vowel sounds, not in consonantal sounds – it is not possible

to have a word with just a consonantal sound;(iii) if there are clusters – consonantal clusters, for instance – the natural tendency is to break them (examples were given from both the Indian and the foreign contexts to prove this point); (iv) if clusters are insisted upon – as in the case of the three consonantal sounds followed by the vocalic – it comes with a price, for only a limited number of sound combinations will be allowed.

It was thus established that at the level of phonology – at the level of sounds – human beings follow a highly organized system of language – and this is the case trans-culturally, trans-geographically, trans-historically.

Discussions on **TASK III** were equally participatory and issues of phonetic distinctions came to the fore. PAPA, BABA, MAMA – how does the child come to differentiate between these words? Obviously, it is the difference between the sounds प् ब् म् that matters. There was a lively discussion on how, though all three sounds involved the lips, there was a difference between them – and what this difference was, how the vibration of the vocal chords and the variation in air-pressure helps create the different sounds. In the course of this engrossing inter-action in the collective session, quite a few nuances of the phonetic system of language also came to be understood by the participants. The child comes to pronounce these words naturally – she is not trained into doing this – *Papa, Baba, Mama* are words that come of their own, as if she unconsciously knows how to pronounce them : it was thus established that *the child has seemingly already figured out the difference in the sounds involved.*

A **second set of tasks** followed - in groups, the participants discussed the following :

1. What is the ‘story’ of र in Hindi – its various manifestations and implications in terms of use.
2. What is the distinction between म् and ण् in Hindi?
3. What does the Hindi plural look like – what is the grammar of the Hindi plural?
4. How do you make plurals in English?

The PRESENTATIONS once again underlined the significance of the systematic structure of language. In the **English plurals** group, for example, it was found that the plural of all words ending with the प् ट् क् sounds would have the स् ending (ship – ships, slap – slaps, trap – traps, bat – bats, shirt – shirts, pack – packs, stick – sticks etc.); the plural of words ending with sibilant sounds (श् स् च् ज् ) would have the ‘iz’ (इज्) ending (fish – fishes, six – sixes, pitch – pitches, judge – judges etc.); and the plural of all words ending with any other sounds would have the ज् ending (show – shows, zoo – zoos, shoe – shoes, plough – ploughs, car – cars). An analysis of and

discussion on the work done by the other groups reinforced the idea of the firmly established structural constructs of language. It was realized that the child comes to a conclusion about the system of rules of the language through a natural process, without any explicit instruction.

The last part in this exercise on language was, again, **group work**, this time done **at the level of sentences**. The groups were to work on two aspects of making questions in languages : how to make questions of the yes/no type – that is, questions that can be answered in the form of ‘yes’ or ‘no’ (for instance – Is Kalidasa a poet?) and the ‘wh’-questions (for instance, Who ate the apple?) : the participants were to develop rules for these two types of questions, one group working on Hindi, three on English. The poser was – if the child makes the right type of questions, what is it she knows that enables her to do so?

Questions and answers were framed and analysed, and rules derived from the observation of how the questions were formed. It was realized that in the case of ‘Yes/No’ type of questions, the verb would come at the beginning and it switches places with the subject of the sentence ( Kalidasa is a poet. – Is Kalidasa a poet?). A sentence was taken up – ‘John ate an apple in the morning at home daily’ – and the construction of questions taken up around it. The question words were identified as *who, what, where, when* and the rule worked out that the ‘Wh-’ word would be placed at the beginning, the auxiliary would be inverted and the constituent we wish to have as an answer would be eliminated ( When was the apple eaten by John?). In the course of this exercise, certain other rules were similarly “discovered”. *This, it was asserted, is the knowledge that the child already has* when she correctly frames questions and makes sentences.

**Conclusions** : On the basis of the rigorous exercise on language, the participants were taken to the conclusion that these rules that were worked on must have some sort of representation in the child’s brain – that is why even a child of three can make new sentences, understand sentences – indeed, construct innumerable new sentences. There **must be a set of rules in the human mind**; how is this set of rules extracted – this is a question being worked on by neurologists. And yet this is how it is: there is no teacher, no explicit grammatical statement to help out, and still the child figures out this delicate system of rules – and this innate capacity must have a blueprint of all languages. The human mind is born with the feel of the language. The **environment** is the second factor that goes into the making of language and its use by the child: it is the interaction between the human mind and the environment that leads to the accumulative result reflected in the use of language by the child.

Implications of these “discoveries” for classroom teaching were also discussed in adequate detail in the last session.

Another aspect of the *Nature and Pedagogy of Language* part of the workshop was the issue of **natural acquisition of language**, and the role of the first and second language in this scenario. The preliminaries were set into motion by the resource person, **Ms. Vijaya Srivastava**, with a brief introduction that referred to how the social environment plays its role in the acquisition of language by the child, how this natural acquisition comes in bits and pieces, in an unstructured form. This situation was sought to be contrasted with the formal, traditional-instruction environment, with the focus on the language itself, limited time for learning, small ratio of native to non-native speakers, and moving from simple to complex in terms of language learning.

There was, in the course of this segment dealing with Language, a **brief exposition on stages of first language (“home language”) acquisition** (minus the script) and then some work in groups on two small readings. The stages of first language acquisition were identified as *the silent stage (that goes up to around 7 months of age)* when the child is trying to make sense of the perceptual world through cognition, grappling with and imbibing what is happening around her – the stage in which the child creates sounds but not language; the babbling stage (around 7 to 12 months) ; the move towards adult-like utterances (around 1 to 2 years of age); and the stage when the child masters adult-like language (3-4 years). It was pointed out that the process of comprehension goes on even in the stage of babbling. Thus, the processes involved through these stages include, first, comprehension, followed by producing sounds, and then, much later, the stage of writing.

**Two readings** were worked upon **in groups** : (i) *Applied Research in Language Education* by R. Amritavalli, and (ii) *Bilingualism and Bilinguality*, an excerpt from a work by Josaine F. Hamers and Michel H.A.Blanc. The readings gave the participants an idea of the scenario in language-learning in schools, and an insight into the acquisition of the first and the second language. The **presentations on the two readings** gave a gist of what the groups came to conclude from them.

The **first reading** dealt with researches carried out in Kendriya Vidyalayas, with their pattern of dual medium instruction – teaching of Mathematics and the natural sciences through English, and the Social Sciences and Arts through Hindi. The question addressed by the case studies in question was “whether content-subject teaching through English provides opportunities for learning that language”.

The group-work culled some **insights from the reading**.

1. The fact that some subjects were taught in Hindi and others in English perhaps led to a situation where the students were in a difficult situation - of being able to learn neither the languages properly, nor the subjects.
2. The reading underlined the fact that "a test of the comparative English proficiency of English-medium learners and Kendriya Vidyalaya learners... reveals that the latter have not suffered by not having certain subjects taught in English."
3. Another *finding* of these researches was that "what leads to the acquisition of English is not so much content-subject teaching as communicative opportunities and the out-of-school environment": on the basis of this the study "recommends the use of English as a medium of instruction for an activity subject."
4. A *significant finding* was that " 'bilingual education seems to reduce the gap between the different social classes', the performance of learners from socially underprivileged backgrounds being 'almost as good as' that of learners from more privileged backgrounds."

On the basis of the group-work and discussion it was concluded that **bilingualism** seems to help in developing problem-solving capabilities; also that one of the ways in developing language skills could be the teaching of content-subjects in Hindi (considered, here, to be the first language) and activity-based subjects in English (the second language). One of the participants also shared the Canadian and Swedish experiences - studies carried out amongst the lower strata immigrants under the language shelter programmes wherein children were taught in mother tongue and then led to the learning of the second language. The reading ends with the comment that there "is research in this country....which clearly establishes that bilingualism represents a cognitive gain rather than a deficit."

The **second reading** (*Bilingualism and Bilinguality*) was an excerpt basing itself on a study of North American school systems but found to have significant **parallels with the Indian scenario in terms of the importance given to English as a language**. In the Indian situation, the reading was contextualised thus : in terms of the AIM of teaching English as the second language, the rationale is traced to the awe for English on account of its colonial background, the reality of it being the language for higher studies (especially as little material is available in the first language at this stage of education), and the argument in favour of linguistic diversity. This LEADS TO an emphasis on English, the second language, in the classroom, downplaying of teaching in the first language (Hindi, for instance), and teaching of content-subjects in English - and a desire to belong to the English speaking group in society. The RESULTS are seen to be in the form of failures in both the first language and second language in

schools (for the child is seemingly unable to master any of the two languages), the development of an inferiority complex in those who are deprived of or poor at English, and problems at the higher levels of education in terms of understanding English. The failure is usually ascribed to what is described as the “bilingual handicap”. The sum total is the increasing reinforcement of the myth that the first language acts as a handicap in the learning of English : the excerpt used as a reading, however, establishes that “one must accept that the school system rather than the child’s bilinguality is the main factor responsible for poor achievement.....it is not the state of bilinguality per se, but socio-structural, socio-cultural and socio-psychological factors which are responsible for poor academic achievement.”

Some work was also done in groups in terms of **evaluating learning materials**, that also involved a discussion on pedagogy in some ways. The participants were formed into six groups of four each to have a look at various books published for children, analyse them in terms of material designing and layout, illustrations, skills covered, grammar and vocabulary etc. on the basis of a checklist. The **group work** was followed by a session of reporting in which the groups came out with their observations. The books under consideration were *Under the Bed*, *Play Book* with exercises for 4 to 6 year-olds, *Work-Book with Big Book II ( A Pot of Light)*, *Language in Use (a book for foreign language learners)*, *Broadway*, *English Reader Book for Class V*, and *English Through Reading* ( a book for children of the 16+ age group) – all of them in English. Most of these books, it was felt by quite a few, were grounded in an urban setting and the thematic content too was therefore loaded in favour of the urban reader; there were few activity-based exercises; there was an emphasis on language being used as a skill. It was also observed that these books seem to take listening, speaking, reading and writing as cut and dried language abilities rather than looking at language as a meaning-making process in which all these abilities play a holistic role. It was discussed as to how these four “skills” could be organized around activities to bring the meaning-making process into play. The exercise was meant to make one think how our books are generally structured and what improvements could be hoped for in them.

Some time at the end of this segment of the Nature and Pedagogy of Language was spent on *Reading and Reading Comprehension*.

## BRAIN TEASERS

The workshop was intermittently enlivened by puzzles.

PUZZLE I : There are 12 balls, all identical in appearance and in make. One of these balls is, however, different - it is either heavier or lighter than all the others. You are given a balance for weighing. What is *the minimum number of weighings* to be able to tell as to which of the balls is different – *also, whether it is heavier or lighter* ?

PUZZLE II : Quechua is a South American language family with about 80 lakh speakers spread over Peru, Bolivia and Ecuador. Six sentences were given in Quechua (for example – *Antukaq chakranpiqa t'ikashanmi papa*). The English translations of the six sentences too were given – but in a mixed-up order, with the expectation that the participants would indicate which translation goes with each Quechua sentence. ( It would be something similar to six sentences being given in Tamil with their translations in Hindi, and a non-Tamil-knowing Hindi speaker being asked to match the translated sentences with those in Tamil).

Engrossing puzzles they came out to be !

## FEEDBACK SESSIONS

As in the first workshop, the first session daily was the Feedback Session that gave the participants an opportunity to share their impressions of the proceedings of the previous day, clarify doubts, raise issues and give suggestions. This was also the session that brought major issues related to the arena of education in the country on board.

### **Report Writing and Documentation:**

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