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CONTENTS

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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EDITORIAL

A researcher while writing a research paper or an article is constantly engaged in a dialogue within himself/herself as a writer as well as a reader. This process that goes on internally involves reflecting on what is written and critiquing it at the same time. A similar dialogue almost simultaneously goes on with the professional! research community involved in exploring ideas and creating more knowledge. This renders the communication process inherent in a research writing an interesting and thrilling experience. To make this experience lively, *Indian Edncational* Review, a research journal of NCERT, provides a dynamic medium for ensuring effective communication amongst those interested in educational research. Disseminating educational research, exchanging research experiences among fellow researchers and motivating young researchers go a long way in enriching the discipline of education and educational research.

The present issue contains research papers, research notes and abstract of researches funded by ERIC. It contains contribution on varied dimensions of school education, such as role of traditional knowledge, participatory decision making, inclusive education, vocational education, use of educational media, incidence of underachievement, and developing environment friendly behaviour.

Beginning with the subsequent issue, we intend to offer a window to our readers through which their ideas, views, suggestions and comments can be obtained on a regular basis. This will not only lead to increased interaction but also provide us feedback for further improvement of the journal. Your specific opinions or experiences on significant contemporary issues, challenges and problems directly related to education in general and educational research in particular are cordially invited. We seek your blessings and cooperation to make the journal more useful to researchers by including scholarly discussions on pertinent issues, reports and reviews of researches and important research initiatives.

ASHOK K. SRIVASTAVA
Academic Editor

Form IV *(See Rule 8)*

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I, Peyyeti Rajakumar, hereby declare that the particulars given above are true to the best of my knowledge and belief.

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Research Papers

Role of Traditional Knowledge in a Knowledge Society

Interpreting Insights for Contemporary Use

R.P. SINGH*

ABSTRACT

This paper seeks to examine the possibility of the use of traditional knowledge/insights developed over a period of time in the Knowledge Society. The author asks the present generation not to neglect it and not allow it to be lost in the haze of antiquity. It also gives reasons why this knowledge continues to be relevant in our contemporary societies. This is perhaps one reason why the National Knowledge Commission has specifically mentioned the importance of this traditional knowledge in our educational system.

"A technologist first builds a transport to travel on earth, second in the water and the third capable to fly in the sky. 0 person! Such technologists impart happiness, triumph and make us powerful. It connects or regulates such movements in the ocean with thoroughness. Likewise, they should train more people to multiply the number of more technologists." Rigveda,2. 18.2

Meaning of 'Traditional' Knowledge

Before we define *Knowledge* let us try to understand the use and meaning of the term 'traditional' first. Tradition lexically means "the handing down of opinions or practices to posterity unwritten", i.e., something society remembers to be useful and even after repeated trials finds the results consistently uniform. This is the scientificity of a tradition. All traditions have two components – one the uncritical ritualistic, and the other 'open' for a dialogue before a change. All societies have to deal with both. The uncritical and the ritualistic form of a tradition, if followed, make a society 'closed'. Invariably such

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societies get dominated by priesthood and become inimical to progress. It is the 'open' societies that welcome criticism, dialogue, dissent and eventually progress. The best indicators of 'openness' are the multiplicity of educational managements and a variety in the school curricula. Such societies alone welcome' criticism or questioning of a tradition and ignore the classes who oppose change or variations in social practices.

Defining Knowledge

How does one define a 'Knowledge Society'? Firstly, let us try to understand the meaning of the term Knowledge. Knowledge is nothing more than rational, cumulative, classified, graded bits of information, which can be openly questioned. Information is a single point illumination of a query, which most of the time is an uncritical reply and whose source is invariably difficult to identify. A Knowledge Society is characterised by 'openness' and acceptance of new ideas and innovations. Being progress-oriented it is forever ready for a dialogue, experimentation and rationality. It is possible that some of us may hold the view that knowledge societies are a modem acknowledgement of a reality and that such societies have appeared only recently. This is not true. Such societies have existed in the past also and their quantum and the level of knowledge continue to surprise us. In fact, in a number of areas such as philosophy, ethics, science, literature, architecture, etc. the Greeks, the Egyptians, the Chinese and the Indians reached pinnacles of glory.

There are areas in which the ancients have yet to find their modern-day match. For instance, in Philosophy, Bertrand Russell acknowledges that the entire development in this field could easily be summed up in a single footnote to Plato's *Republic.* The Pyramids continue to amaze us for the way they built vaults to preserve their dead and the material used to keep their remains unblemished. We have yet to find a match to Confucius or Lord Buddha and for the Aristotle's theory of the 'golden mean. We have not succeeded to add a new plot to the seven identified by Aristotle or excel the use of Divine intervention in resolving a complex situation in dramatic plot.

Knowledge by itself is both multi-dimensional and unique. It has a typology of its own. Besides being eternal and contextually identifiable, knowledge has a variety and its set goals. For instance, human knowledge is different from that of the animals. Each Discipline as a Knowledge area has its own stock mostly different from that of the others, and, even when the new stock is merely a derivative it

seeks to explain the differences from remaining independent and un-submerged. Knowledge is distinguishable both by its age or the geography. When exported, changes its allegiance too and acquires a new identity such as Indian/American or Australian English. Knowledge could be static and/or developmental. The only thing that characterizes knowledge is that it changes its hue, control, definition and the state of development in terms of politics – whether religious or otherwise. Therefore, while knowledge in a democracy is always on the rise/development in an autocracy or dictatorship can never be similar.

This means Knowledge exists in varying stages of development – some nascent, other developing or some fully developed. All traditional knowledge need not be developed afresh. In a way knowledge remains forever amenable to critical examination. Each stage of advancement has a context to consider. For instance, in the Indian context our society lives in varying stages of material and social development. A few of us have grown materially and intellectually so advanced that a comparison with European society appears legitimate. But the majority lives in conditions of extreme destitution and intellectual poverty. Generalisations, therefore, become irrelevant.

One must therefore remember that societies are not homogenous. Just as it is impossible to find everybody to be identically healthy or sick, humans continue to offer a variety in existence. Similarly, there is no question of finding everyone equally accomplished or well-read. Therefore, all societies are identified in terms of groups of people who differ from each other either racially or culturally, and who have characteristics that help keep their identities distinctly definable.

The Sublimity of the Vedas as a source of Perennial Knowledge

The Vedas are correctly regarded as repositories of all kinds of ancient knowledge and the acme of ancient Indian wisdom. In them lie the seeds (at times the finished products) of our modern knowledge. For instance, there is hardly any branch of knowledge, viz. music, astronomy, physics, modern mathematics, yoga, alternate medicine, philosophical systems, literature, grammar and prosody, etc., whose foundations cannot be traced back to them. A few know that the binary system, which gave birth to computer sciences, has its origins in the Vedas. The yoga and the alternate medicine, which are the current rage in the West, can also be traced back to the Vedas. True, we have outgrown many of the Vedic discoveries and findings. But there are numerous areas of knowledge where we are still groping in

the dark alongside the ancients. In some ways the contemporary astrophysics has brought us back to the *Nasdiya Sukta* to compare notes. Be that as it may, we share with them the desire to learn and discover.

We find that the Vedas contain two types of knowledge – one that is eternal, this knowledge is given to us as a finished product; and, the other that changes with time and people. The knowledge they give us about the nature of humans – like health, moral or religious code, philosophy, etc. is liable to change either through deliberate efforts or time. The reason is simple. Each age and time defines its health, morality, and material requirements. But the constants like the need to work for a living, do business, undertake travel, evolve methods and modes of govemance, etc., remain constant with plenty of scope for redefinition in their form and content. The Vedas offer us a variety of knowledge most of it being eternal! or constant. They also lay the foundation for a possible variety and scope for advancement.

Traditional knowledge has it own uses. The Vedas informed us way back in time that, "O people! You should discover the attributes and myths of wind and sun. they create water and juices of all types by penetrating through the clouds and make prosperity. The rain water does not stay with the sun. The origins of the water give knowledge about the sun and let us know that." (*Rig Veda* 2.30.2) It is perhaps since then that the Indian farmers know the meaning of wind direction, the movement of the seven stars, the usefulness of the sun, and the moon, relationship of months with seasons and the interpretation of the colour of the sky with prospective disturbances, etc. They have been told over a period of time when certain birds appear, sing or squeak that portend a change in weather or when the black ants move from one place to another along with their household wares it signifies climate shift. For our purpose it is enough to understand that all these simple tit bits of knowledge passed on from generation to generation come in handy since they help supplement the predictability of scientific and time-tested human awareness and information. If we wish to define the uses of traditional knowledge we shall have to conclude by saying that the entire stock of human knowledge is built up on the information handed down from one generation to another and eventually this amounts to measuring the level or extent of a society's progress. The ones who lag behind get classed as backward or 'developing' and are those who neither create new knowledge nor store the knowledge that is readily available in the form of traditions. Besides they do not possess

in adequate measure the necessary wherewithal of transferring it either.

What we call scientific or objective reality is something that has a lineage of tradition. Repeated experiments or testing the reliability or validity of an information/hunch/or/hypotheses makes the information thus gathered scientific – because it could be demonstrated anywhere to show consistency in the results. In a manner of speaking, therefore, 'traditions' in most cases are nothing but scientifically valid truths whose origins/sources have been forgotten or are just not readily available for comparison. This does not qualify for a sneering act on the part of those who generalise knowledge as a derivative of some available source other than mere oral tradition.

In the case of India, our traditional knowledge has withstood the test of time. The illiterate farmer *is* nearly as good a weather forecaster as a weather reporter who has the benefit of scientific gadgets. This comparison may not hold good always, but the predictability of both sources of information is seldom questionable.

Traditional Knowledge as Conceived by the National Knowledge Commission

The National Knowledge Commission (NKC) too has assigned a certain role to this traditional knowledge in their scheme of things. Although one may not agree with the definition of the traditional knowledge given by the NKC (p.22), it is true that the "appropriate application of this knowledge can enrich people's lives and livelihoods, provide alternative means of sustenance and generate substantial employment."

The NKC has written that it is examining "the following aspects of traditional knowledge:

1. The principles that should govern the documentation and use of plant based drug formulations;
2. Traditional agricultural practices;
3. Culinary traditions;
4. Traditional water-harvesting techniques
5. Traditional products, services and art forms not included above.

As it is, the NKC has already received "a report on the traditional health sciences for their globalisation". I suppose the reason why a

Report on this area of traditional knowledge was the first to be submitted is because this branch of health sciences is more well-known and its practitioners have always been available ever since the times when *Atharvaveda* was compiled. But then there are other areas too that are equally well-known and nearly as much traditional—a few that have a direct bearing on our daily life and are linked with our food habits, naturopathy, environment, our rationality and mental health.

Though it is not possible to include all these areas in this paper or go into details of the benefits that may accrue if we were to learn the truths that were recorded in the Vedas but for the benefit of those who wish to learn about them, only two or three aspects of that knowledge are presented. We must remember that a section of the Indian population reveres the Vedas although they shall never read them or learn anything from them. Faced with the energy crisis the modern man should know that the Vedas had exhorted in their time the scholars to "know the nature and properties of energy and should take the optimum use of that knowledge" (*Rig-Veda* 2;9.1). What is most intriguing about the Vedas is that they come all of a sudden not unlike a bolt from the blue without any precedence/continuity or knowledge of the state of society that produced them. We know practically nothing about the pre-Vedic people, the state of their material/literary development, their social organisations/customs or preferences, etc. The usual support for any historical statement that one derives from subject areas such as archeology, written words, etc. provide no help to an individual trying to piece together a picture of the time that preceded the Vedic age.

Connotation of Certain Terms in the Context of the Vedas

It is important to define a few terms used in the context of the Vedas. It may interest some to know that *Sukta* means what is pleasant to hear or something nice that has been said. In all, the Vedic *Samhitas* (as distinguished from the literature based on the Vedas such as the *Brahmanas, Upanishads, Aranakyas, etc.)* consist of 20,500 mantras. The other thing worth noting is that a number of *Rgvedic* verses appear in the other Vedas too. The Vedic prose is rhythmic. The Vedas contain the earliest recorded poetry and prose literature of the human race. The Vedas are *no sastras*, i.e. they are not systematised knowledge with a set of any scientific terminology. In most cases they summarize the insights gained over a period of time.

Samhitas means compilations. The *Suktas* and the *mantras* that are compiled under *Rik* are called *Rik Samhita* or the *Rigveda.* Similarly, the mantras compiled under *Sam* or *Yajus* are called *Samveda* or *Yajurveda.* The *Atharvaveda* is so called because Rishi Atharvan wrote a substantial part of it. For a long time the *Atharvaveda* was not regarded as part of the *trayi* tradition. Generally, it is believed to be the last Veda because its content reflects a society very different from the society in the earlier Vedas. It seems by then the Aryans had come in contact with the local tribes and aborigines who believed in sorcery, magic and other satanic powers and all these impacts got reflected in the mantras of this particular Veda. In her book, *A Short History of the Vedic Literature* (1994), Dr. Pushpa Gupta advances reasons for accepting *Atharvaveda* as the last Veda. According to her (a) religion had peaked by then,(b) it deals essentially with the material world that deal with mundane occurrences of human existence, and {c) thereafter no new prayers were written.

The meaning of a few terms generally used while talking about the Vedic literature are explained earlier. For instance, the *Sukta,* means good poetry, or *Mantra* means speculation or summary of thought presented in quintessential form. The term *Samhita* means compilation. On the basis of the meaning and the nature of the content the *Vedas* are called *veda-trayi.* This use does not denote that the reference here is restricted to three Vedas only and the fourth Veda, i.e. the *Atharvaveda* has been excluded. At the same time it is generally taken to mean that only the first three Vedas count and the fourth does not get similar weightage.

Though technically the word Veda means knowledge/*gyan*, the Indian tradition holds that the Vedas contain both the contents and purpose of the *karmakaand*, i.e., the sacrificial rituals as well as the *jnankaand*, i.e., the spiritual knowledge. On the basis of these twin purposes of the Vedas the sacrificial aspect of them is contained in the *Brahmanas* and the *jnan*/or the spiritual aspect of the knowledge is dealt with in the Upanishads. In fact, Apastamba titles both the *mantras* and the *Brahmanas* as the Vedas.

Ii is believed that internal evidence available in the *sruti*/or what was revealed or heard is indicative of the gradual complexity of language development that took place then. The ancients preserved the Vedas through oral tradition. It is common knowledge that to keep any language unchanged for a long time is simply impossible. A living language will invariably change both because of its natural tendency to absorb new words and idioms in its repertoire and to keep modifying pronunciations with each successive generation. This

linguistic reason forced the ancients to devise a system that prevented such a change to occur. They, therefore, evolved a regular disciplinary system known as the *vedangas*, i.e. the limbs of the Vedas. It was felt necessary to lay down general rules for pronunciation of words properly. Change in pronunciation leads to change in the interpretation and meaning of the words. This necessitated the formulation of *shiksha* and *chhandas.* The *vedangas* are six in number. They are: l. *Shiksha* (orthography), 2. *Chhanda* (prosody), 3. *Nighantu* (lexicon), 4. *Jyotis* (astronomy), 5. *Vyakarana* (grammar), and 6. the *Kalpa* (rituals).

The ancients also divided knowledge into several areas of specialisations. These knowledge areas are called the up-Vedas or the minor Vedas. These are: I. *the Ayurveda* (the science of medicine and cure), 2. the *Gandharva-veda* (the system of aesthetics), and 3. the *Dhanurveda* stands for the system of defense sciences, and 4. the *Arthaveda* means economics or the science of wealth which is concerned with the production, distribution and utilisation of wealth. For the development and growth of this kind of knowledge it is more than obvious that the ancients must have taken a very long time. In fact, the form in which the Vedas themselves have been made available to us makes an interesting reading.

The area which is currently of the greatest concern to the Mankind, *namely – Environment*, will be taken up first for discussion. Let us see what the Vedas have to say about it.

Long before others came to realise the value of environment the ancient Indians had perhaps intuitively learnt that trouble comes from unknown sources and, therefore, it is better to take care of the immediate neighborhood first. This neighborhood is environment. By definition 'environment' means "The aggregate of circumstances surrounding organisms or group of organisms including the social and cultural conditions affecting the nature of individuals or community." Hence, the following prayer:

> "May the five types of men, born to offer (the butter of) affection, and eager to perform the sacrifice, be pleased with my discharge of the function as an invoker; *may the earth preserve us from the troubles that come from heaven.*
> "May you, spinning the thread of divine knowledge, follow the splendid light of the illuminator, and protect the pathways well...
> "The great river of life-conflicts flows alone, be alert; rise up, cross over, my friends; here let us leave those who are wretched and hence unhappy; may we cross over (this river) to secure auspicious boons." *Rig-Veda* X.54.5-7)

The present write-up is addressed to those who have a very vague idea of how knowledgeable the ancient Vedic society was. In whatever form the Vedas have survived, they tell us enough about the Nature, Life and the concerns of the ancient Indian. Since I have for my write-up selected the Vedas as the principal area for exploration I have gone by the text that is available; therefore I have not bothered to include any analysis of the archaeological findings of Indus Valley Civilisation to show how the urban populace of those times had evolved amazingly the most sophisticated and scientific urban water supply system and also the sewage systems that have been excavated.

The Vedic society is no less advanced and knowledgeable about the world around them. The Vedic Seers appear to have foreseen the catastrophe Man was likely to invite for his own destruction, therefore, they had forewarned against indulging in such acts.

The appreciation for 'enlightened person' is remarkable for the ancients. Read what they have to say, "O men! I praise an enlightened person who shines and purifies like the fire kindled well with fuel, who is steadfast in non-violent sacrifices, pure, purifier, liberal donor, respected by many scholars, void of malice, wise with knowledge and humility and highly learned." (*Rig-Veda*, 6.15.7)

Experience informs us that mere knowledge is rarely enough to prevent trouble, and it is also true that we rarely listen to reason until the catastrophe takes over and we are left with nothing else but regret. In the modern high-tech world people have little time and even less patience to go deeper into any text even when it might have enormous value for one's guidance. Indeed, it is no longer considered necessary to read scriptures or may be it is even considered un-intellectual, if not infra dig, to try discovering any particular sense in reading them. Perhaps it is the job of a priest who is put paid for his services to read the same out in bits and pieces on ceremonial occasions.

Contemporary Environmental Concerns and the Vedas

Indian historians took considerable time to discover the meaning and the message that the Vedas carry and that too only when the Western scholars had started using the Vedas and their text for purposes other than those of mere scholarship. One must admit that it is the West that initially led the path back to our glorious past and furnished insight to find for us gems that had been lying hidden in the obscure homes of the neglected but venerable scholars.

The relevant hymns on each of the manifested contemporary environmental concerns from the text of the Vedas are cited here to show that the ancient Indians had the knowledge of the environmental problems but their future progenies, alas! did not have the 'Will' to act. The message is clear. If we failed once there is still time to mend our ways. This is the sole purpose of learning History. Historians as interpreters of facts are capable of delivering subtle messages to the posterity.

Although all the four Vedas were supposed to have appeared simultaneously, the common belief is that the *Rig-Veda* came first. It is in this Veda that we see *vayu* or air being regarded as the soul of human beings. They realised the value of the air and talked of its curative powers. "Lord *vayu* is the soul and spirit of *Indra* and all other gods and living beings and is the seed of the world. Such a divine Lord flows according to its Will. We can only hear it but cannot see it. We bow before this Lord *Vayu*." (*Rig-Veda* X.168.4). Additionally they came to realise that air had its own curative powers. Therefore, they prayed, "O Vayu! Bring your medicines and do away with all the ailments here because you are the only one who is full of curative powers." In the history of Indian philosophy there is discussion about the evolution of the concept of *Atma* or the source of life, which was at different point in time was variously identified with air, water, food, etc. Even now we call soul as *prana vayu.* Since they rated all these 'elements' as divine and identified them with soul or life itself, it was unimaginable for them to have even thought of polluting anyone of these.

Read, for instance, their feelings about Mother Nature:

> "I address this new laudatory hymn, with all sincerity of heart to the fire Divine, who loves it; and appreciates; may he hear our voice; may I be in the centre of His heart... ..like a loving well-attired wife meeting her husband.
>
> "I address this new laudatory hymn, with all sincerity of heart to the fire Divine, the absorber of water, to whom the oblations of herbal juices (mixed with curds) are offered and in whom every living being like vigorous horses, bulls, milching cows and barren ones, sheep and goat are consigned to the cremating fire.
>
> "The vast heaven, the spacious firmament, and the glorious unbounded earth; pay homage to the fire divine, Lord of the cosmic sacrifice; Nature's bounties such as lightening, the sun, the water, the wind and the cosmic intelligence, with potentialities purifies, recognise him with one accord.

"The rivers flow along with the dashing storms and sweep over the boundless earth, with them the circumambient lightening, spreading over a wide space thundering in the belly (of the firmament) bedews everything thing that lies within." Rig-Veda, X.92. 1-4)

In terms of Western history the concern for environment dates back to 1962 (which is very recent) when Rachel Carson wrote *Silent Spring*. This book focused on the enormity of ecological damage brought about by industrial waste being dumped into the rivers. Then came the papers by Barbara Ward and Rene Dubois in 1972 "Only One Earth." Their project had been funded by UNDP. It brought to the fore the conflict between biosphere of Man's inheritance and the techno-sphere of His creation. Since then the voices of concern for the safe upkeep of this creation have not been silenced. The concern clearly is about keeping the environment livable. The express desire is for striking a balance between material prosperity and human sustenance. The 'Club of Rome' – funded by independent scientists, too has shown similar concerns and proposed almost identical schemes to sustain life on this planet.

The 'Limits to Growth", brought out in 1972, reported research findings based on data collected at global scale on a mathematical model. The model predicted Doom and stated that continued resource shortages, crowding, pollution, famines, etc. will soon control current trends in population growth, natural resource exploitation and capital investment in agriculture. As expected the model was heavily criticised. Since then the problem remains where it was seen for the first time. As of today, the problem is whether or not, based on non-renewable resourcs, is it possible to maintain a certain rate of sustained growth forever? We unfortunately are no longer ideologically neutral.

The Indian concern for the environment is as old as our civilisation's origins. But did the ancients understand the meaning *of* the term 'environment'? Perhaps they did. But then what exactly do we mean by this term. 'The environment (after all) is sum total of water, air and land, inter-relationships among themselves and also with the human beings, other living organisms and property." This definition appears in the Environment (Protection) Act, 1986.

In modern terminology if one wanted to have a comprehensive knowledge of the subject the minimum requirement is to go through several stages of a variety of subject areas; such as Botany, Zoology, Microbiology, Genetics, Geology, Bio-chemistry, Bio-technology,

Oceanography, Atmospheric science, Statistics, etc. It would appear as though we hold the view that if the ancients spoke on all these subjects with equal command like us then alone they would be considered knowledgeable enough for our good failing which, let us keep them under covers for a few recluses and the lonely.

For instance, see in this quote a desire that we have in common with the ancients, i.e. work so that one could meet one's physical needs and an airy house to live in. "I resort to agriculture and craft for removing poverty and ministering happiness to all. May I feel joy in domestic life! May our houses be sufficiently commodious, airy, fully comfortable, and built in the middle of an open space" (*Yajurveda*, Chapter 1.11) .

For an obvious reason an individual engaged in agriculture knows the value *of* timely and plentiful rain. In this sense we have not outgrown this basic requirement: "Let us see with respect that earth, which loves the rains and is looked after by the clouds, in which is grown food grains like rice and barley, and where live all the four castes, and the other five types *of* people". (*Atharvaveda*/12/1/42).

As one reads the Vedas, one is made to realise that the ancient Indians suffered from the same weaknesses as we do, but they prayed to get rid of them through sustained efforts called the *yagnas.* For them, "the *yagna* keeps away the thieves, refines and sweetens the speech, is productive of foodstuffs and is the bestower of knowledge and vigor" *(Yajurveda,* Ch.l.16) .

We see in the following few pages the type of knowledge they had of the Nature and its capacities. They desired that we do not transgress boundaries and remain within acceptable limits to avoid catastrophe. See here their knowledge about fire/heat.

> *"I describe the special features of Fire. It takes every type of matter forward. It softens iron ore etc. it burns everything. It emits light. It beautifies. It is set up before everything else. It performs many functions and is used during many activities. It is an instrument for attracting attention, give and take and for food preparation. Fire creates inside earth all varieties of gems and ores like gold, silver, iron, and diamonds"* (*Rig-veda* 1/1).

In the following quote the reader could see that they had knowledge of Vaastu and were fully acquainted with the powers of the Nature's Elements.

> *"O husband and wife! We want to construct a house for you; that is fully lighted by the strong rays of the Sun. For Sun is strong and capable of giving happiness yielding light"(Rig-veda* 1/155/6) .

About the Solar energy they say:

"Learn carefully about the presence of Vaishwanar Fire in us all. The same Agni/Fire is located in all worlds and the same is working through Vaishwanar Sun doing all kinds of work such as producing light, growth of plants etc." (*Rig-Veda* 1/98/1).

Here is a hymn from *Yajurveda* (XXXIII.92), which talks of the functions of Sun.

"Just as the Sun, set in Heaven, the benefector of humanity, increasing in power on Earth, ripens medicines and grows food, removes darkness of night with his lusture, shines forth, so should ye dispel ignorance...".

"Just as lightning destroys insects that disturb sleep and spread disease, let us enjoy all the fruits and favours granted to us by the Sun and the wind and thereby let us feel safe against Nature gods" (*Rig-Veda 10/36/4).)*

Or read their knowledge about the relationship of Sun with the formation of clouds and feeding rivers with plentiful water:

"O Gurudev! Just as strong, light-emitting Sun attracts the waters of these rivers toward itself and having done so distributes them through clouds allover again on the land, so do you attract students and instruct them with eclat" (Rig 7/34/10).

The Seers, therefore, enjoin us to learn to "respect that special Guru who is powered by education, who is familiar with the work of *Agni, Vaayu, Sun* and other deities and knows all about the names, places and the births. You should respect those Gurus too who understand the speed of air and the lightening and who can tell you the exceptional ways to Salvation" (*Rigveda*/7/58/1*).*

They offer a lesson or two in human psychology for compassion toward one and all.

"May that intellect which is inside me let that be full of feelings of welfare for others. It is because of that the industrious, reflective and patient men work to gain both knowledge and the riches, and undertake to give charity, worship gods and work for mutual benefit, and that which is located in all living beings"{*Yajurveda*/34/2).

"Even as all spokes in a wheel are joined together in the centre may my intellect also carry feelings of welfare for others because of the coming in of knowledge from the Rigveda, the proper methods of actions from the Yajurveda and of worship from the Samveda" (*Yajurveda* /34/5).

We could see their concern for the education of all, more particularly of girls. At least in this sense they were far ahead of us. While discussing methods of instruction, the Seers also talk of how to practice writing. Incidentally, the following lines throw light on a historically disputed domain. Few historians dispute the fact that the Vedic people had no script and therefore writing was unknown to them. I suppose it is possible to resolve that contentious issue whether or not the ancients knew how to write, what to write and the lack or otherwise of a script. The fact that they knew about the written word can be established even otherwise. For instance, on the demerits of gambling the *Rigveda* (10/34/2) says that the faces of the dice carried written symbols. At another place (viz. *Rig-veda* I0/62/7), there is a mention that the ears of the cows have the number 8 written on them.

Additionally, these lines also show that education of girls was common and prevalent. In their opinion female teachers are better teachers than their male counterparts.

> *"O girl students! Just as intelligent teachers introduce writing and reading of letters with the help of fingers, you should know lady teachers who know: innumerable subjects and possess immeasurable learning. For your balanced I development such an intelligent teacher will herself make all arrangements"* (*Rig- veda*/ 7/15/9).

In case this is not enough to establish their knowledge about language/linguistics then see elsewhere they mention that mere reading is never enough because people learn at a pace which differs from individual to individual:

> *"A few do not understand the secret of the language even after reading it, a few others do not realise the reality even after listening to it but there are others for whom the language presents her true form as does a beautiful bedecked bride reveals herself before her husband"* (*Rigveda* 10/71/4).
>
> *"Language through its own symbols explains the wide expanse of knowledge and is able to illumine all intelligence fully. Therefore, one should put language to good use"* (*Rigveda* 1/3/131).

We see here the functions of language per se and its symbolic nature. It perhaps holds a lesson or two for the modern day linguists.

What did the *Rigveda* say about the nature of the universe (cosmology) I astrophysics that we live in? We may have advanced in varied ways but about the origin of the galaxies, stars and planets we are still nowhere being close to certainty. Even today we have not

gone beyond the realm of conjectures in numerous academic areas such as astrophysics for instance; then how could we expect the ancients to be definitive about their knowledge, who definitely had no access to the present day scientific instruments, which make a Hawking so knowledgeable and relatively certain? According to the ancients the universe consisted of three regions – the earth (*prithvi*), heaven (*dyauh*), and the intermediate world or the *antariksha*. We are familiar with the term earth, but not with *dyauh* because this is one term which was employed to denote the vault of the sky, which is the place where the sun and the stars shine. They had an idea that there was an invisible world too where these stars and the sun retired after their daily ritual/duty was over.

The Rigvedic hymns sporadically mention the abodes of padam of *Agni*, (1.72.2), Indra Pusan (1.162,2), Vishnu (1,154,6), etc. In reality they appear to think that the universe consisted of four regions. The name of the fourth region is *Satya Lok*. Read Rg. (1.35.2), which says "Causing immortal and mortal to rest, God Savitr returned (to his abode) by way of the Satya Lok (i.e. invisible) world; he comes on the golden chariot observing the worlds." The Satya Lok was considered the abode of Brahma, the Creator. The later day developments have only added certain more *Loks* worlds to the list. Only as a passing reference I mention here the seven *loks* that the Puranas talk about. From *Bhu-lok* upwards are *Bhuvar Lok*, *Svar-Lok*, *Mahar Lok*, *Jan Lok*, *Tapo-Lok* and the *Satya Lok*. Similarly, by that time the idea of seven 'nether' worlds had also grown and developed. They were called *atal*, *sutal*, and *patal*, etc. according to the depths at which different unwanted creatures supposedly lived.

Vedic Concept of the Origin of the Creation

Numerous references are made daily to the unusually wonderful understanding these Rishis had of the origin of the Creation, especially to the scientificity of their observations. For instance, the subject of Creation interested these Rishis immensely. The *Rigveda* talks of it in the Hymn 10/129/7 and Yajurveda in 10/129/3, etc. It does amaze one to imagine that even without the benefit of any of the modern equipments and gadgets they could be, at times, so precise in their observations. For instance, the Vedas hold the view that in the beginning there was nothing but darkness. It was the state of Nature, which could drown all without a trace. That extensive Nature, which is hidden in the Cause form, the same with the shinning glory of the divine God appears in the physical form as its effect. A

comparison of this piece with the findings of modern astrophysics may be of great interest to all.

After reading the *Nasdiya Sukta* one feels surprised at the latent modernity of reasoning and logic:

"What was the state during the Pralaya or total annihilation? Who is the Creator? What was the principal cause of Creation and what its principal instrument? During Pralaya there was no evil or good nor did the atoms fill the horizons? What was shrouded and by what? Who was the Protector? Did only the deep seas exist?

"There was no death nor was there any life. Even the day and night had not taken birth. The lone Creator breathed without any life, breath by his own will. Nothing superior existed beyond him.

"In that dark existed, the un-manifested Nature like seamless water. Everything looked small before Him. Nature gradually manifested itself because of the austerities of the Supreme Being"(*Rigveda* 10/129 i-v).

A Desire was superimposed on what existed in the "form of inner self during *Pralaya*. The seers could thus realise that the Good was latent in the Evil even as the light is in the dark. The creation could arise out of the un-manifested Nature. Slanted bright rays spread out of these three – God, Soul and the Nature. What was below was as amazing as the one who could serve as receptacles for that amazing semen above. If one went deep into the description of the origins of the Creation itself. we start dealing with the eternal questions of Philosophy whose definitive answers continue to elude us. Our understanding of the Reality is as remote today as it was when the ancients were trying to grapple with it.

In a hymn the seer says, *"One thing that is beyond this world is matter, the material cause of this world, another thing even beyond this is the soul which is remote in rareness and not within reach of ordinary man"* (*Atharvaveda*, Book V, XI. VI).

The Art and the Science of Architecture

Interestingly, the *Atharvaveda* carries a section on the *Vaastusastra*—the art and science of architecture. Here a number of hymns talk of God being present in a three-room school or the eight-room school. One cannot imagine of a three rooms or eight rooms building without proper measurements and even building materials.

"Like the animal heat in the body and foetus in the womb I, the master of the house live in the houses, which are built with two

wings, four wings, six wings, eight wings, and are constructed in appropriate measurement" (*Atharvaveda* /9/3/21).

In fact, so great is the insistence on the proper measurement of the size of the rooms and the accurate mixture of mortar that one could seriously start thinking about the presence of the ubiquitous modern day contractor in that society too. One would be amazed to read about their express desire to make lighting arrangements that are necessary for a large room. The mention is of electricity and also of teaching aids. I must say I have failed to be specific because I do not know whether this light is not lightning and teaching aids something very elementary and highly primitive in character. These hymns in question are: *Atharvaveda* 9/ 3/1 and 9/3/11 and many more. The fact that God is present in all these classes of the school does suggest that schooling was carried on in built enclosures and not under the shade of the trees or in the hermitages only.

The Ideals of the Vedic Guru

It is not quite correct that all the gurus had equal competence. But in terms of their insistence on respect there is near unanimity. The impression that we have is that the Guru did not charge fees. May be he did not do so in the beginning. But no student could leave the residence of the teacher without paying the appropriate amount in terms of tuition fees/*guru-dakshina.*

On pupil's return home the following hymn specifically desires that the teacher should make some relaxation in the strict rules that one followed.

"O the best Guru! The restrictions that you had imposed on us regarding food, sensuality and travel, please relax them now. 0 luminous with knowledge, Gurudev! We shall continue to observe all the pure vratas, and shall continue studying with unbroken regimen, the Vedas. (*Yajur*/12/12).

In fact, there is a mention that at the time of leaving the Ashram the student does say that he would like to know about the time one could leave the school and when does he invite the teacher home. *Atharvaveda* (11/5/26) describes how glorious the student looks on the completion of his education.

But here is one mantra wherein the teacher refuses to be admired by a student whom he regards to be a fool.

"O you, my pupil! Who shuns practice in learning, even if you are ready for employment immediately, I do not like your praise because

you cannot repeat properly even those lessons that have already been taught. You, who are famous amongst fools, I do not like any praise from you. I would much prefer you becoming properly educated and earn reputation than what you are Right now. That would enhance my reputation" (*Rig-Veda* /7/22/5).

"The teachers who teach at the lower levels and offer expertise may they improve and grow. Those that teach at the middle and higher stages let them too 1 progress and develop. The teachers of Som-knowledge let them too progress. Let all these teachers teach us the techniques and methods of prayer and the yagnas. *Besides these teachers, those who know the techniques of the yagnas and are aware of the way the Universe was created and are free from crookedness and have long lives may they too impart us instruction"* (*Rig-Veda*/10/15/1).

Let us now take an example of their concern for keeping rivers free from pollution:

"O God! Cast aside the vile man who pollutes rivers... " says the *Yajurveda* (XXX, 8) and the hymn goes on to command, Nishad's son, hankering after libidinous women; a degraded arrogant, friend of person harmful like a tiger; an uneducated person attached to low dancing and singing women; the demented, given to the application of magical rites; an untrustworthy person who befriends the serpents and fools, a non-gambler, who creates unnecessary excitement; a woman who creates split among the *Pishachas*, the thorny woman who favours the freebooters."

Look at the way they desire the trees to be protected, He, who rears the trees by erecting barriers round them...conduces to our happines,." (*Yajurveda* XX.45).

In *Yajurveda* (Chapter XXII), hymns after hymns talk of protecting oneself against the physical aiIments and bless those that help preserve environment. Hymn 5 in the chapter admires one who "protects beautiful objects like the Earth". The next hymn is even more explicit "Make the best use of me. Take medicines. Derive joy from drinking water. Enjoy well the warmth and light of the Sun. Have knowledge of air and vital breaths. Perform yagna in fire".

They knew that "The Sun moves singly and alone. The moon is brought to life again. Fire is the remedy of cold. Earth is the vast field for production" *(Yajurveda* Ch.XXIII. 46).

To the questions: "What luster is like the Sun's light? What lake is equal to the sea? What is smore spacious than the Earth? What things are beyond measure?" The reply is given in the next hymn.

"God is luster like the sun. Heaven is a flood to match the sea. Sun is vaster than the Earth. Beyond all measure is speech" (*Yajurveda* Ch.XXIII.48). It is difficult to find an answer better than this one from a Seer.

Of Birds and Animals

I now cite from *Yajurveda* Chapter XXIV wherein the Seers talk of birds and animals and their attributes and characteristics and where to locate them. The loving manner in which they talk of these birds and animals merely underlines the fact that they knew their beans about environment and wished to protect it. These hymns begin from number 11 and continue up to 40. There is not a single animal known to a veterinarian practitioner that is not described along with its typical characteristics. Read for instance, hymn 18 "The anintals of peace-loving parents are smokey-coloured and of brownish hue. The animals of parents who sit in assembly for propitiating *yagnas* are brown and smoky-looking". The next hymn commands "O men, bring into use the pre-mentioned agricultural animals". Then comes the knowledge of the experts. "An expert in the knowledge of animals finds Kapinjalas in spring, sparrows in summer, partridges in the Rains, quails in Autumn, kakras in Winter and Vikaras in the Dewy season". The rishis describe also the uses of each animal according to the class of people for whom they are intended. It is not possible to reproduce all the hymns to show the knowledge of the Seers or their desire to preserve all these species but it is perhaps enough if we appreciate their knowledge and perception from the following hymn (40): "Rhinoceros serves all warriors in preparing their shield; the black dog, the long-eared ass. The hyenas are used for protection against the demons; the boar is for the king who wants to tear asunder his enemies; the lion is swift like air; the chameleon, the Pippaka, the vultures are used for making arrows; the spotted antelope is used for preparing mrigshalas for the learned people."

The next chapter (XXV) opens with a hymn for protecting all objects worthy of desire. Read this hymn in totality, "Learn for the teeth the act of biting; from the gums the method of protection; from tooth-sockets the way of pounding; sharpness from the fangs. Use the tongue tip for a learned utterance; learn the act of uprooting from the tongue; the use of palate by crying slowly; chew with both the jaws; drink water with the mouth. Acquire the knowledge of oozing semen from testicles. Recognise the *Aadityas* from the beard; know the path from the eyebrows; know the sun and earth from their motion; lightening

from the pupils of the eyes. Observe celibacy for the protection of the semen; acquire knowledge through high character. *Objects worth acceptance are worthy of preservation.* Objects after one's desire should not be resisted. Don't show disrespect to your own men. Friends and relation should be fostered."

Whatever else may have been the motive of these Seers in commanding Man to worship God and perform yagnas, one thing is certain. They knew well their environment and wished to protect it.

What better could one offer in terms their understanding of the Nature's cycle around them than the following quote:

"When the clouds cultivate the earth with its waters; then winds are blown (for the rain to fall), lightening is struck, vegetation comes to life and grows,sky pours the raindrops and the earth then gets ready for the welfare of the. world" (*Rig Veda* 5/83/4).

We should remember that the ancients wrote an entire Veda on the science of medicine called the *Atharvaveda*. They went into details how a herb has to be identified and then they describe its properties for different ailments. They achieved and left behind knowledge of an almost fully developed medical science, which is currently proving to be helpful to the entire Mankind. Therefore they had prayed, "0 God, create a man of iron determination for the implementation of a vow... a forest guard for the protection of a forest.. and drive away a forest burner contemplating the destruction of jungles" (*Yajurveda*, Ch. XXX. 19). One might as well put a question: "What else does a forest officer do other than protecting a forest and preserving wild animals and their habitat under his charge?" In the same chapter of the *Yajur-Veda* in hymn 10 the seer prays "0 God create a physician for purifying our body with the eradication of disease; an astronomer for the advancement of knowledge; an inquisitive man full of cravings for knowledge; an extra-inquisitive man for desire of extra-knowledge; and a question-solver for establishing moral law." If read closely one can see the hymn telling us that all knowledge is located in curiosity and for extra knowledge one has to put in extra effort.

"O Spiritual juice (of wisdom and devotion) thou hast been prepared carefully for the soul. Let diseases stay afar together with the fiends of lust, anger, greed, pride and jealousy" (Samaveda Hymn. 561). This hymn clearly states that "those who are double-tongued or crooked, cannot take delight of drinking thee." It would be clear to the reader that disease or physical ailment is as good as being crooked or a doublespeak. It is much better to avoid them both. It is only then that "those who are of calm nature like the rays of the moon, (will) be full of strength and wealth of wisdom."

I cite here a hymn (*Samaveda,* 1837) that has been interpreted differently by two scholars of eminence, viz. Satvalekar and Griffiths, whose two versions are given below. Meanwhile the reader should also realise that it is quite common for the hymns being interpreted differently by different scholars. This is precisely what I wrote in the beginning about the difficulty of agreeing on the common meaning of a hymn or even of a single word. The Vedas can be read for different purposes, as they are capable of giving more messages than one can imagine. In fact, it is impossible to understand everything they say and why do they say what they actually say. Majority of the Indians regard them as revealed books because no human being could have been so wise as to cover all themes and subjects, besides all aspects of human life as they do. Probably for this reason alone that F. Max Muller wrote the following:

"What can be more tedious than the Veda, and yet, what can be more interesting, if once we know that it is the first word spoken by the Aryan man?"

The Vedas have a two-fold interest for us.: They belong to the history of world and also to the history of India. As long as man continues to take interest in the history of his race, and as long as we collect in libraries and museums the relics of the former ages, the first place in that long row of books which contain the records of the Aryan branch of mankind, will belong forever to the *Rigveda*."

So much for the glory of the Vedas! This praise comes from a man who learned Sanskrit and translated the Vedas only to make Hindus Christians.

Be that as it may, the first interpretation is of Satvalekar:

1. "O Omnipresent Divine Mother! Thou art source of happiness. So endow us with strength and pleasure of great vision (realisation) of truth."
2. Griffith's translation: "Yea waters, ye bring health and bliss; so help ye bring health and bliss ye us to energy that we may look on great delight".

It is interesting to note that this hymn has something to do with water. In the next hymn the reason why water is mentioned here is made clear. Because water is known to be the source of life as it is one of the five elements or *tatva* that constitute life and at the same time water is also a cure for numerous diseases even if used singly.

The hymn number 1638 from Samaveda has two meanings. One is an external meaning and the other internal. The external meaning

is as follows: "O water! Let your most prosperous juice be ministered to us in this world with the readiness that affectionate mothers apply to their infants".

The other interpretation is spiritual in character. "O Divine Mother! May thy most auspicious juice of bliss be ministered to us in this world with the readiness that affectionate mothers supply to their infants".

The next hymn talks of water being used for removing diseases. It is significant that the use of water as a medicine was known to them and therefore it becomes even more meaningful that this water has to be clean or pollution free. Look at it from an ordinary person's point of view by the time the Seers came to writing the *Atharvaveda* they had learnt through experimentations as well as through empirical evidence the curative value of the usages of both herbs and lotions including water. This Veda is a living testimony to the fact that science grows only empirically. And the seeds of modern laboratories were first grown in the Vedas. This is one History lesson that one should learn from reading the Vedas.

To end the write-up I cite the Rig- Veda (X.1/46):
"Lady of the Forest! Lady of the Forest!
Who seems to vanish from sight in the distance?
Why do you never come to the Village?
Surely you are not afraid of us.
When the grasshopper replies
To the lowing of the cattle,
As though to the sound of tinkling bells,
The lady of the Forest makes merry.
Sometime you catch a glimpse of her, and think it is cattle grazing
Or a house, far away
And at the evening you hear the Lady of the Forest
Like the distant sound of moving wagons.
Her voice is as the sound of man calling his cattle.
Or as the crash of a felled tree,
If you stay in the forest in the evening
You will hear her like a far voice of crying.
But the Lady of the Forest will not slay
Unless an enemy draws near
She eats the sweet wild fruits
And then she rests wherever she will
Now I have praised the Lady of the Forest

Who is perfumed with balm and fragrant?
Who is well-fed although she tills not?
The mother of all things of the wild!

And what greater respect could Man show towards all the elements of Mother Nature than the prayer from *Yajurveda* (36/17) for peace or recite the *Shanti mantra*, which desires that 'let there be peace in the heaven, horizons—where the Earth and sky meet, peace in the vegetation, peace on earth, peace in everything' etc., and this prayer is always sung at the end of any holy *anushthan* or ceremony and this *Shanti mantra* may be accepted as the ultimate for any environmentalist.

I have already referred to the twin state of knowledge being both developed and developing. We have seen how the ancients were concerned about preserving the Nature as God's gift and now I cite a case of knowledge which has continued to grow ever since it was given birth. The current rage for adoption of the Yogic exercises, make us think that this knowledge is very recent origin. This is far from being true.

This knowledge was readily available in the Vedas. However, what has been added to that knowledge is something quite unique. For instance, there are today numerous schools of the Yoga (the *hath yoga*, *rajyoga, karma yoga*, etc) and a few *asanas* may also have been evolved and even got patented during the course of development, but read what the *Rig-Veda* has to say on the subject. It is the seed knowledge which has thus prospered over a period of time.

"God who is realised through the practice of seven parts of Yoga consisting of Yamas, Niyamas, Asanas (proper postures), pranayama (control of breath), pratyahara (withholding from external affect), Dharana (concentration) and Dhyana (meditation) commands us in our own interest and is the constant giver of prosperity, riches and plenty." (*Samveda* Book 2, chapter 2; 101).

Until this day the Vedas have not been studied in terms of Knowledge they impart and their secular content has also not been classified in terms of knowledge areas/discipline. But if read carefully, the Vedas touch upon all areas of human interest; be it astrophysics, chemistry, mathematics, music, yoga, or philosophy, rules of governance, parliamentary system, moral law, raising of army and its management, etc. The Vedas have been preserved as collection of liturgies but the fact is that there are other ways to make their content examined and presented. Time has come when the secular content

of the Vedas has to be classified, indexed and presented. In this paper I have tried to discuss this very role the Vedic knowledge can play. This should serve as an example for future/prospective researchers. The basic role of traditional knowledge is to offer ideas and suggest areas for further research. We must accept the fact that growth in knowledge is limitless comparable to the cosmos whose dimensions remain hidden from human ken,

Participatory Decision Making in Educational Organisations

Review of Instruments

DEEPA MEHTA* and ALOK GARDIA*

ABSTRACT

Participatory Decision Making (PDM) in educational organisations has been studied extensively by Scholars. Current theorists maintain that teacher participation in decision making not only facilitates decision implementation, but leads teachers to feel respected and empowered. This point of view derives support from the 'human relations' school of thought too. In spite of the overall importance of teacher's participation in decision making the major problem faced by the researchers in educational management today, is of selecting appropriate measuring instrument to quantify PDM, and the problem may be due to lack of a uniformally accepted multi-dimensional construct. Present article reviews the available instruments on PDM from India and abroad. The article provides conceptual development of PDM in view of its measurement and its dimensions identified in various previous studies. Further, the article also advocates multi-dimensionality of the instrument on the basis of previous researches and reports all available decision areas where teacher's empowerment may lead the organisations to perfection in all the dimensions of organisational effectiveness.

Effective organisations do not come about magically. They are the result of careful planning and strategic decision making. Such decision making, in fact, pervades all administrative functions, from planning, organising and staffing to directing, coordinating and controlling (Lunenburg and Ornstein, 1991).

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Current theorists maintain that teacher participation in decision making not only facilitates decision implementation, but leads teachers to feel respected and empowered. Further, such participation builds trust, helps teachers acquire new skills, increases school effectiveness, and strengthens staff morale, commitment and team work (Lashway, 1996; Liontos, 1994; Martin and Kragler, 1999; Peterson-del Mar, 1994; Wall and Rinehart, 1998). Consequently, participatory decision making (PDM) has been identified as an important contributor to successful educational management. Shapiro et.al (1995), for example, maintain that PDM is "the heart of administrative process, crucial for any administrator's success in any organisation". Similarly, Plunkett and Fournier (1991) view PDM as a "powerful antidote" against institutional complacency and failure.

The advocacy of participatory decision making (PDM) in educational organisations has led to the production of a good body of research that provides ample empirical evidence and begun to emerge supporting a shared approach to decision making in educational institutions. Transfer of decision making authority from central government to institutional members, for example, was found in schools to yield greater productivity, greater teacher satisfaction, and enhanced student learning (Biziorek, 1999; Enderle, 1999; Horejes, 1996; Lagerveij and Voogt 1990; Leithwood and Jantzi, 1999; and Weaver, 1997). Consequently shared decision making (SDM), i.e. the involvement of faculty in deciding issues related to school governance, has been increasingly advocated as essential to bring about significant change in educational practice (Brown and Miller, 1998; Reitzug and Capper, 1996).

Brown (1973); Gibbon (1976); Van Til (1976) and Klausmeir (1977) also recommended the adoption of decision making processes different from those traditional ones utilised by many secondary schools. They specifically recommended wider participation of teachers in the decision making process. This point of view derives support from the 'human relations' school of thought, which Hass and Drabek (1973) interpreted that an effective organisation must be a set of interlocking functional groups, linked together in a communication network, with communication and influence flowing up as well as down through the hierarchy of authority.

Review of PDM instruments

Participatory decision making in educational organisations has been studied extensively worldwide and, in these researches the concept

of PDM is differently operationalised by various scholars. The studies conducted on and instruments developed for PDM show different stages in operationalisation of PDM. Earlier it was considered as a uni-dimensional variable but afterwards it was proposed to be a multi-dimensional variable.

Among the early efforts to quantify PDM, Dykes (1968) studied faculty-participation in Academic Decision Making and identified six major areas of college administration namely – Academic affairs, Personal matters, Financial affairs, Capital involvements, Students affairs, and Public and Alumni affairs.

Alutto and Belasco's (1972) work is a pioneer one in the field of PDM. They studied participation in educational organisations as a uni-dimensional concept. Their survey instrument asks teachers to report on the extent to which they actually and should participate in decisions that are made in their schools. They classify individual teacher as decisionally saturated, in equilibrium or deprived in following 12 decisional situations occurring in school systems: Hiring new faculty members; Selecting specific instructional texts; Resolving learning problems of individual students; Determining appropriate instructional methods and techniques; Establishing general instructional policies; Establishing classroom disciplinary policies; Planning school budgets; Determining specific faculty assignments; Resolving faculty member grievances; Planning new buildings and facilities; Resolving problems with community groups; and Determining faculty salaries. Here teachers indicated whether they currently participate in and whether they desire to participate in each decision.

Conway (1976) modified Alutto-Belasco's (1972) Decisional Participation scale to measure the independent variable. Consequently, one item was added (dealing with administrative services), one eliminated (determining disciplinary policies), and two combined into one item (instructional policy determination and determining instructional methods and techniques). The response format also was modified as to allow teachers to indicate the degree to which they were participating as well as their preferred state of participation. Mayer (1978) used ten decisional items in his survey questionnaire – teaching loads, class size, teacher assignment, teacher evaluation, student discipline, budget policies, non-classroom duties, class preparation time, instructional methods, and course content.

Mohrman et al. (1978) refined the earlier works of Alutto and Belasco, Conway and others cited so far by drawing upon Parsonian

theory. Here the response format was a five point scale ranging from (1) Never to (5) Always, and each individual received three scores for each decisional area; perceived actual participation, ideal participation and a deprivation score. They identified the 12 decisional areas included in the original measure of Alutto and Belasco (1972) to fall into three dimensions, viz. Managerial (decisions regarding managerial support functions), Technical (decisions that are central to the technical task/instructional process of the school) and Negotiation (decisions reflecting issues and activities that are dealt with by the teachers' union).

Further, the instrument developed by Dan Riley (1984) was formulated to determine the actual and desired level and type of teacher participation in 30 areas. Respondents' degree of decisional deprivation was calculated by subtracting desired level from actual level of participation. The 30 items were drawn from instruments already favourably tested for reliability and validity (Bonnette, 1975; Chamberlain, 1976; Conway, 1976; Sharma, 1955; and Devlin, 1978). The items fell into three areas consistently addressed by all of the instruments: curriculum and instruction; personnel and teacher evaluation; and pupil evaluation and conduct. The thirty items were divided into 3 groups each relating to one organisational level; classroom, building and district. The type of involvement ranged from (i) No participation, (ii) provide information, (iii) Recommend decision, (iv) Influence decision, and (v) make decision.

Brian Spence (1988) tried to find out the decisional deprivation among senior staff in secondary schools through the questionnaire which was based on that used by Davies (1983) in his research into head of departments' involvement in decisions, where the respondents were asked to rate their actual and desired degree of involvement on a scale from 1 to 7, from no participation to full participation, for each of the following decision areas: total resources allocation in school, use of the school fund, staff appointments, use of community-based funds, stock ordering and equipment, curriculum design for the school as a whole, curriculum design for their department, and allocation of staff to classes. Three more areas relating to pupil allocation, decisions about pastoral care, and contact with parents were added by Brian Spence (1988) in questionnaire developed by Davies.

Bacharach, et al. (1990) grouped 19 areas to measure teachers' decisional participation and attitudes into four domains, i.e. strategic-organisational, strategic-individual, operational-organisational, operational-individual. The items involved were: school

assignment, standardised test policies, classroom assignment, grading policies, student assignment, reporting procedures, student removal, student right, facilities planning, what to teach, budget development, how to teach, expenditure priorities, books available for use, staff hiring, books used, performance evaluation, staff development, student discipline.

Ferrara, Donna Layne (1993) while trying to find out more representative and meaningful ways of conceptualising and measuring teacher participation in shared decision making, developed the Teacher Decision Making Instrument (TDI) which measured 68 decisional situations. The TDI utilized a scale which measured both extent and mechanism of decision making; measured actual and desired participation, permitting calculation of deviation scores; expended the number of items and areas studied; and treated decision making as multi-dimensional. The categories of empirical and conceptual interests for this study were planning, policy, curriculum/ instruction, pupil personnel, staff personnel, staff development, school/community and budget/management.

The areas of shared decision making involvement examined by Hicks, Aletta (1994) included: Vision building, the development of curriculum and instruction, and the establishment of student and teacher standards. Trotter, Juanita Louise (1996) quotes in her study about Russell's (1992) questionnaire – "The Teacher Involvement and Participation Scale", Version 2 (T.I.P.S.). The eight decision making areas in this questionnaire were – goals/vision/mission, standards, curriculum/instruction, budget, staffing, operations, facilitating procedures and structures; and staff development.

The principal research instrument utilized in the study conducted by Kuku and Taylor (2002) was the same "Teacher Involvement and Participation Scale", Version 2 (TIPS 2) developed by Russell et al. (1992).Besides the eight decision making areas, a ninth subscale, developed by Masinda (1997), provided a spiritual matters dimension to this instrument. On all subscales, participants responded to two dimensions – actual participation and preferred participation in school governance, utilising a 5-point Likert scale ranging from Almost Never to Almost Always.

Instruments used in India

In Indian context PDM has not attracted adequate attention of researchers and policy makers. However, some sporadic efforts have been made to study PDM in relation to some organisationally prized variables.

Srivastava (1980) identified four major areas of college administration. First was the Academic area which deals with curricula, college schedule, work load of teachers, library, instruction and evaluation, students' admission and publication; second major area was non-academic area which includes personnel matters, financial affairs and capital involvements; third major area was college faculty-student affairs including objectives of college, planning and development of college, faculty affairs – professional growth, residential facilities, recreation, student affairs – discipline, student union, hostel, aids to students, and the last major area was extra and co-curricular area including areas such as sports, games and athletics, cultural/social activities, educational tours or trips.

Rathore (1983) developed teachers' decisional participation scale containing 40 items dispersed across three major domains (Managerial, Technical and Institutional) in multi-dimensional perspective in the line of Mohrman et el. (1978). The decisional areas which he had taken in his study were planning school budget and financial affairs, school personnel administrative decisions, building and facilities, liaison with board/inspector of school, problem with community, general instructional policy, instructional methods and techniques, instructional material and text, resolving problem of the students, students promotion and evaluation policies, classroom disciplinary policies, free-ships and scholarships, admission, time table, examination, teachers' work load, adoption of innovative programmes and extra co-curricular activities.

Taj, Haseen (1995) developed a scale of 28 items to measure teachers' participation. Mehta (2007) constructed Decisional Participation Scale to quantify university teachers' actual and desired participation in decision making. The scale composed of 20 decision areas pertaining to three decisional domains, viz.: Managerial, Technical, and Institutional. The decisional areas studied were-planning department budget and financial affairs; Planning new physical facilities such as – building, furniture, apparatus, etc.; designing and implementing staff development activities; dealing with employee grievances; determining specific professional assignments; maintaining department – central office relationship; taking staff disciplinary actions; designing classroom discipline policies; establishing general instructional policies; determining classroom pedagogy and procedures; designing students' promotion and evaluation policies; defining students' welfare policies (such as giving freeships, Scholarships, prizes, medals, etc.);forming students' discipline policies in the department; determining the aims and

objectives of the department; planning curriculum and course content; planning extra co-curricular activities; preparing department calendar for the session; determining students' admission procedures; and dealing with students' grievances; undertaking research projects. Responses were gathered from a five point Likert type scale ranging from always to never to compute teachers' decisional discrepancy.

Operationalisation of PDM

The studies reported above have treated PDM under various approaches. Different approaches have been identified and practised by scholars so far, viz. non-evaluative, evaluative, single-domain, and multi-domain approach, but the major problem faced by researchers is related to the operationalisation of the construct PDM.

For quantification of decisional participation, a *non-evaluative approach* reports only participation behaviour of the teacher irrespective of his/her high or less desire for participation in decision making process, whereas another approach reports participation behaviour of the teachers with respect to their high or less desire for participation. Latter approach is called *evaluative approach*, which is more enlightening as it exposes the level of teachers' actual participation in relation to their high or low desire for participation. Under non-evaluative approach researchers are concerned only to increasing the absolute level of participation. Whereas in the evaluative approach researchers are mainly concerned with increasing participation only in the decisional area where teachers are decisionally deprived.

Non-evaluative approaches are based on the assumption that all members of an organisation are likely to expect the same level of participation (Alluto and Belasco, 1972). Thus, non-evaluative approach consists a narrow view towards participation as controlling all teachers' expectation to the same level is quite impossible task while this limitation does not exist in evaluative approach in which "*the desire for participation is (not) equally and widely distributed throughout an organisation*" (Alluto and Belasco, 1972).

Further, PDM has also been quantified using two approaches – *single domain approach and multi-domain approach. In the single domain approach, researchers combine all decisions into a single dimension, examining participation in decision making as an aggregate organisational characteristic* (e.g. Alluto and Belasco, 1972). This approach, thus, fails to take in to account the multiplicity of the

variety of decisions taken in educational organisations. In educational institutions decisions are taken in various decision making situations which are not necessarily of a similar nature. Thus, after Alluto and Belasco (1972), many researchers started viewing participation in decision making in a multi-dimensional perspective, which categorises various decisions according to the nature of decisions being taken or the authority by which the decision is being taken. In a multi-domain method, researchers adopt the decision as the unit of analysis and identify several domains of decisions.

Further, in conceptualising the specific domains of participation in decision making under multi-domain approach, researchers studying PDM in educational and other organisations have suggested that teacher participation vary according to different decisional domains or situations, for example, strategic versus operational (Bailyn, 1985) and technical versus managerial (Bacharach, Bauer, & Shedd, 1986; Mohrman et al., 1978). An integration of these domains suggests that technical decisions, such as those relating to the means by which a given task is to be implemented, may be viewed as operational. Managerial decisions relating to the allocation of resources (e.g. budgets, staff), achievements of organisational goals, and problem-solving, appear to be, by definition, strategic.

Single/Multi-domain, Non-evaluative and Single/Multi-domain, Evaluative Approach

Above discussed evaluative/non-evaluative approach, and single/ multi-domain approach result into Single/multi-domain, non-evaluative approach and single/multi-domain, evaluative approach. For example, Hoy and Sousa (1984), Bishop and George (1973), IDE (1981), Aiken and Hage (1966), Hage and Aiken (1967) used single domain, non-evaluative approach; and Miskel et al. (1979) and Bacharach and Aiken (1976) applied multi-domain, non-evaluative approach. For studying teachers' participation, the single domain evaluative approach in a refined manner has been adopted by a number of researchers like, Alutto and Belasco (1972), Alutto and Vredenburgh (1977), Bacharach, Bauer and Conley (1986), and Conley et al. (1988).

Mohrman et al. (1978) criticised these approaches on theoretical as well as empirical grounds and adopted a multi-domain evaluative approach. Later on, in their studies Rathore (1983), Riley (1984), Bailyn (1985), Bacharach, Bauer and Shedd (1986), Bacharach, Bamberger, Conley and Bauer (1990), Ferrara, Donna Layne (1993),

and Mehta (2007) have utilized Mohrman et al.'s approach and demonstrated its utility in their researches. Table 1 gives a synoptic view of various dimensions of participation that have been used for quantifying it:

TABLE 1
Summary of Vanous Approaches

Approach	*Single-domain*	*Multi-domain*
Non-evaluative	*Single non-evaluative* Bishop and George (1973), Hage and Aiken (1967), Aiken and Hage (1966), Hoy and Sousa (1984), I.D.E. (1981).	*Multi-domain non-* evaluative Bacharach et. al (1976), Miskel et. al (1979).
Evaluative	*Single evaluative* Alutto and Belasco (1972), Conway (1976), Alutto.and Vredenburgh (1977), Davies (1983), Bacharach et. al (1986), Conley et. al (1988), Brian Spence (1988).	*Multi-domain evaluative* Mohrman et. al(1978), Rathore (1983), Dan Riley (1984), Bailyn, L (1985), Bacharach et. al (1986), Bacharach et. al (1990), Ferrara (1993), Kuku and Taylor (2002), Mehta (2007).

The table reveals that many studies of participation in decision making have adopted a monolithic (single domain) approach to the construct, failing to identify the specific domains of decisions in which teachers can be involved. Multi-dimensional evaluative approach too has been used frequently by the researchers to operationalise PDM. Bacharach (1990) opines that *though multi-dimensional evaluative approach is richer and detailed than the single domain method; it fails with respect to generalisability. However, some researchers have attempted to minimise this draw back by "Clustering" different decisions in to general domains. This multi-domain approach has the dual advantage of examining aggregated decisions without loosing the richness of analysing specific decisions and assuring greater comparability of results across different occupational and organisational types.*

The discussion on different instruments of PDM above shows that the operationalisation of PDM is diversely viewed by different

researchers at different point of time, which ultimately leads to the conclusion that participation is a multi-dimensional or multiform concept. Moreover, due to its precise and exact operationalisation of PDM, multi-domain evaluative approach can be strongly recommended for educational management.

In Indian scenario some fragmentary efforts have been made to measure PDM, more refinement and advancement in the operationalisation of PDM is still needed to establish its organisational utility and as a significant area of research in educational management.

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Inclusive Education – Dismal Future

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ABSTRACT

There has been enormous thrust in the National Policy on Education, 1986 to mainstream disabled children in the Elementary Education programme. The current survey by NUEPA provides valuable data on the status of integrating disabled children under inclusive Education. This paper looks at the paradigm shift in the education of the disabled, focus on International Scenario; highlight the disparities across states in India. Finally, the paper examines the implication of Data for strengthening Inclusive Education. The paper concludes with the emphasis that the Government should work towards providing high quality Education to the disabled and provide relevant training to teachers. This should be an integral part of the implementation of Sarva Shiksha Abhiyan. The dream of Universalisation Elementary Education will be fulfilled after every disabled child is integrated into the mainstream of Education.

National Policy of Education (NPE), 1986 devoted an entire chapter on the Education of the Disabled. NPE while analysing the current scenario estimated that there are 12 million disabled persons, out of which about 2.6 million fall in the age group of 4-15 years. To this, it added another 1.7 million Mentally Handicapped children (MH), thus bringing the total number of disabled children falling under Universalisation of Elementary Education(UEE) to 4.3 million.

The current survey by National University of Educational Planning and Administration (NUEPA) based on the DISE data of 2006 estimated that 1.62 million disabled children are enrolled in the elementary classes across the country with 1.2 million in primary and 0.38 million in upper primary classes. Within the primary, 0.99%

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of the relevant age group of disabled children are studying and it is 0.87% in the upper primary. The enrolment of disabled girls of the above classes in the primary and upper primary classes is only 42% and 40%, respectively. This difference is also reflected in the Gender Parity Index (GPI) calculated for disabled children. The GPI is as low as 0.71 in primary, 0.67 in upper primary levels. This is much lower than the GPI in case of overall enrolment. Urban areas have slightly higher GPI than rural areas. While the enrolment at primary stands at 0.99%, GPI comes down drastically and it is much lower for the girls. This fact brings out the status of inclusive education as it highlights that, even though disabled children enroll at the primary school, they dropout sooner or later and this trend is much more among girls. As a result, UEE is able to more or less achieve the enrolment of disabled children, but not retention and achievement.

Inclusive Education

There has been a paradigm shift in the education of disabled from institutionalised special education programmes to integrating children of all types of disability into the main stream of general education with an exception to severely handicapped children. This shift in the policy decision of the Government of India paved the way for re-orienting teacher education programmes and providing basic infrastructure facilities at schools including building ramps. The data available indicate that the country has a long way to go in achieving inclusive education. In fact, inclusive education is not necessarily limited to bringing disabled children to the main education system and building ramps. It is rather a change in the outlook and an important milestone in providing a new direction to the very philosophy of integration. When integration became an approach to educating disabled children across the world, India chose to accept this and implement in the primary and upper primary schools. A number of problems have arisen as a result of this paradigm shift. These problems will be analysed in this paper with suggestions for achieving inclusive education.

International Scenario

India is a signatory to or participated in the United Nations Rights of the Child, United Nations Standard Rules on the Equalisation of Opportunities, the Jomtien Declaration on Education for All and the Salamanca Statement and Framework for Action.

"Schools should accommodate all children regardless of their physical, intellectual emotionat social, linguistic or other conditions". (Article 3, Salamanca Framework for Action).

"Regular schools with this inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all, moreover, they provide an effective education to the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system". (Article 2, Salamanca Statement).

This framework stems from the message of the Jomtien World Declaration on Education for All (1990) and was reaffirmed in the Dakar Framework for Action (2000).

"... In order to attract and retain children from marginalised and excluded groups, education systems should respond flexibly Education systems must be inclusive, actively seeking out children Who are not enrolled, and responding flexibly to the circumstances and needs of all learners..." (Education for All: Meeting our Collective Commitments. Expanded Commentary on the Dakar Framework for Action, Para 33).

Rule 6 of the UN Standard Rules for Persons with Disabilities

'States should recognise the principle of equal primary, secondary and tertiary educational opportunities for children, youth and adults with disabilities in integrated settings. They should ensure that the education of persons with disabilities is an integral part of the educational system. General education authorities are responsible for the education of persons with disabilities in integrated settings. Education for persons with disabilities should form an integral part of National Educational Planning, Curriculum Development and School Organisation'.

The Indian 'Equal Opportunities and Rights of Persons with Disabilities ACT' 1995, Rule 26, speak about the 'education of children with disabilities up to the age of 18 years in an appropriate environment'.

Indian Scenario

Education of children with disabilities in India, as all over the world, has moved from segregation, special schools to integrated education. There is a national level central government sponsored scheme called

Integrated Education of Disabled Children (IEDC). This project was started in 1980s and designed based on the experience gathered from a UNICEF assisted pilot project called PIED (Project on Integrated Education of Disabled Children). In the mid-1980s many NGOs implemented this IEDC with grants from Government of India. This project is implemented by the Ministry of Human Resource Development. This is basically an itinerant resource teaching approach and one resource teacher was given to every eight children with special needs.

Inclusion of Holistic Vision

Any child may experience a special need during the course of educational years (UNESCO). Some children feel 'left-outs' and never enter school or enter only for a few years and, as repeaters, become 'dropouts' or, more correctly 'pushed-outs', without their needs having been met. These children are a vivid illustration of the failure of schools to teach rather than the pupils' failure to learn. A school system emphasising Education for All should ensure the right of all children to a meaningful education based on individual needs and abilities (Johnson 2002).

The regular schools will now increasingly play a major role in making provision for children with special educational needs available nation-wide. Making the school system flexible and adopting an inclusive approach may, however, prove the most challenging task of all, a task calling for deep reflection and discussion of the two fundamental questions: "What is the overall role of education" and "What is it that we want children to learn in school?" It might lead to the need of reforming the school system as a whole from a traditional, examination-oriented to an inclusive, child-oriented approach.

Disparity Across States

Nature of disability varies among the children in the 6-14 age groups. Table 1 indicates enrolment of children by nature of disability. The direct implication of this is the question of providing facilities and re-training the teachers both on the skills side and the needed attitude. When Integrated Child Development Scheme (ICDS) was launched, it was expected to cater to a substantial number of disabled children in the age group of 0-6 years. The number of disabled children covered in the primary classes either through ICDS or through pre-primary education is quite low. Again here the data is limited to the number

enrolled and not the quality of service provided. A number of studies evaluating the disability programmes and the ICDS schemes have revealed that social stigma of not bringing disabled children to Anganwadi Centres has been a major hindrance. Even though the respective state governments with the help of NGOs have tried to re-train Anganwadi workers in order to be able to diagnose and address the needs of disabled children, the reality provides a dismal picture. There are a good number of Anganwadi centres with absolutely zero disabled children found in a study conducted by Indian Institute of Management, Bangalore (Somaiah, 2005). The ability to attract and retain disabled children is rather high among the private managed schools compared to the government schools. When children do not enter the pre-school programmes in ICDS, they are much more reluctant to enter primary education at the age of six years. Enrolment of children across disability (Table 1) indicates that the highest number have moving disability, followed by visual and 'mentally retarded' in primary schools (1-5) as well as in upper primary schools (1-8).

TABLE 1
Enrolment by Nature of Disability: 2005-06

Disability in	*Grades*		
	I-V	VI-VIII	I-VIII
Seeing	20.06	24.47	21.10
Hearing	9.81	9.50	9.74
Speech	12.53	9.56	11.83
Moving	26.96	36.03	29.09
Mentally Retarded	18.97	9.39	16.72
Others	11.66	11.06	11.52
% to Total Enrolment	0.99	0.87	0.96

Source: NUEPA Study

Enrolment of disabled children across rural and urban areas (Table 2) indicates Gender Parity Index (GPI) of girls to be 0.69 in rural areas and it is 0.74 in urban areas. This is explained due to the higher levels of awareness among parents of girls in urban areas and the increased facilities available in urban schools. Table 3 highlights the enrolment of children across grades by nature of disability and this also supports the earlier table wherein the dominant disabilities seem to be moving, seeing and mental

retardness. Even though across disability, hearing (9.74) and speech (11.83) have lower percentage, its implications on teacher training and retraining are rather crucial. Even a small number of children with certain specific disabilities need to be catered to. This is the major challenge facing the successful implementation of inclusive education. The skill sets provided during the pre-service training of teachers is not substantial to handle varied disabilities in schools. Besides, teachers in many training institutions during pre-service training do not get an opportunity even to visit schools with disabled children, let alone conducting practice teaching in these schools. The lack of hands-on experience in the pre-service training is a major limitation in implementing inclusive education.

Physical Infrastructure

While every physical infrastructure called, facility indicator makes a huge difference for a normal child to be enrolled and retained under UEE, it makes much more difference to a disabled child. To illustrate, schools without blackboard would be a major disadvantage to a partially visually impaired child than a normal child. Lack of facilities for drinking water, for girls toilets, keep away disabled girls from attending schools. Lack of presence of women teachers will add to the lower percentage of disabled girls enrolled under UEE. In addition to this, absence of ramps in schools would make a difference not only to the enrolment of disabled children but speak volume about the effort and attitude of the administrators in making inclusive education a reality under UEE. Even though *Sarva Shiksha Abhiyan* (SSA) emphasises on enrolment of disabled children, there are a large number of schools existing without ramps. The DISE data indicate that only a few schools across the country have the provision of ramps in schools (Table 4). The percentage of such schools is as low as 15.65 in primary and 26.19 in upper primary. It is interesting to note (Table 4) that the government managed schools are (18.6%) more concerned about physically challenged children than private managed schools (10.38%). As usual, urban schools have higher percentage (18.69) compared to rural schools (17.69). This also reveals another disparity of enrolling disabled children. This important dimension of inclusive education has not been taken seriously. It is widely recognised that poverty and disability go together. As a result, there are more disabled children among the poor communities. These children can only enroll among the government schools. In fact, the urban privately managed schools get disabled children from higher

TABLE 2
Enrolment of Children with Disability: 2005-06

Grades	*All Areas*			*Rural Areas*			*Urban Areas*		
	Girls	*Total*	*GPI**	*Girls*	*Total*	*GPI*	*Girls*	*Total*	*GPI*
I-V	5,12,993	12,36,891	0.71	4,48,097	10,82,624	0.71	64,611	1,53,560	0.73
VI-VII/VIII	1,52,684	3,79,965	0.67	1,20,026	3,04,078	0.65	32,568	75,653	0.76
I-VIII	6,65,677	16,16,856	0.70	5,68,123	13,86,702	0.69	97,179	2,29,213	0.74

Source: NUEPA Study

TABLE 3
Enrolment Across Grades by Nature of Disability: 2005-06

Nature of Disability	Gr.1	Gr.1I	Gr.1II	Gr.IV	Gr.V	Gr.VI	Gr.VII	Gr.VIII	Gr.I-V	Gr.VI-VIII	Total
% in seeing	18.19	18.56	19.17	21.04	24.09	23.51	25.01	25.01	20.06	24.47	21.10
% in Hearing	9.36	10.15	9.84	10.00	9.78	10.00	9.57	8.46	9.81	9.50	9.74
% in Speech	14.28	13.05	12.40	11.88	10.60	10.11	9.49	8.64	12.53	9.56	11.83
% in Moving	23.98	25.38	27.03	28.66	30.54	33.70	35.26	41.60	26.96	36.03	29.09
% Mental	23.32	20.62	19.01	16.39	14.41	10.99	8.93	7.23	18.97	9.39	16.72
% Others	10.87	1.23	12.55	12.03	10.58	11.69	11.54	9.07	11.66	11.06	11.59

Source: NUEPA Study

TABLE 4

Percentage of Schools Having Ramp in School: 2005-06

School Category	Percentage							
	All Areas			Rural	Urban areas	All areas	Govt. manage-ments	All private Manage-ments
	2002-03	2003-04	2004-05	2005-06				
Primary Only	4.56	4.908	11.21	15.65	15.95	12.59	16.35	9.43
Primary with Upper Primary	5.03	5.16	14.48	26.19	28.17	17.49	31.06	11.65
Primary with Upper Primary & Secondary/ Hr. Secondary	8.06	8.58	12.85	18.05	17.67	18.69	22.16	15.41
Upper Primary only	4.07	4.69	8.33	12.78	12.76	13.06	14.04	7.97
Upper primary & Secondary/Hr. Secondary	6.10	6.64	10.87	13.32	12.82	14.77	16.12	9.75
All Schools	4.63	5.10	11.49	17.14	17.57	14.62	18.60	10.38

Source: NUEPA Study

echelons of society who are even capable of obtaining education in specialised schools. Besides, they are able to demand better facilities for the children due to higher levels of awareness among parents. This also raises the level of accountability of teachers for inclusive education and increases the demand for training and re-training.

Table 5 highlights percentage of schools having ramps across States and Union Territories. Like any other physical parameter, there has been a wide gap across States and UTs. To illustrate, Maharashtra (59%), Delhi (59%), Harayana (48%) and Gujarat (44%) are the ones with better facilities for ramps compared to other schools. These are also educationally advanced states. On the contrary States having very low percentage of schools with ramps are Nagaland (2.8%), Orissa (8%), Sikkim (4%), West Bengal (8.8%), Jammu and Kashmir (1.9%). These states are also educationally backward. This table brings out the fact that overall educational backwardness or otherwise determines the physical facilities provided for disabled children and correspondingly the enrolment and retention of disabled children. There are two issues here, the ability and willingness of the state governments to allocate funds for developing the required facilities and lack of political will to implement inclusive education which is also reflected by lack of motivation to improve the overall primary education in which inclusive education is only a subset.

Implication of Data for Strengthening Inclusive Education

Most of the services carried out and data generated through information system like DISE are not really integrated into policy making and implementation. The above data on the status of inclusive education speaks volumes about the relevance of this information to policy implementation. The following issues are worth considering:

- The need for involvement of professionals to assess the degree of handicap across disabilities. It is important to network with health care institutions at the grassroot level for early identification. This will, in addition to improving the quality of data, will also provide directions for the schools to persuade the parents and enroll these children under inclusive education.
- Currently there are no monitoring agencies to follow up on enrolment, the quality of education provided within the school and the exposure to the vocational component. This job somehow is not handled well by the Department of Education in any state for that matter. Therefore, it is a good idea to break inclusive

TABLE 5

Percentage of Schools having Ramps in school: 2005-06

State/UT	Percentage of Schools						
	Primary only	Primary with Upper Primary	Primary with Upper Primary & Sec./Hr.Sec.	Upper Primary only	Upper Primary with Sec./ Hr Sec.	No response	All Schools
Anandaman & Nicobar islands	6.21	2.08	7.27	0.00	6.67	0.00	5.57
Andhra Pradesh	6.44	9.28	17.35	0.00	10.67	0.00	7.66
Arunachal Pradesh	5.39	12.59	10.76	0.00	9.09	0.00	6.87
Assam	12.35	12.08	2.35	5.99	3.09	0.00	10.85
Bihar	10.72	15.34	10.14	16.37	5.71	0.00	11.73
Chandigarh	13.79	9.09	33.33	0.00	80.00	0.00	28.65
Chhattisgarth	17.21	8.86	13.07	15.80	13.17	1.79	16.02
Dadra & Nagar Haveli	0.81	2.50	0.00	0.00	0.00	0.00	1.32
Daman & Diu	8.16	0.00	9.09	7.14	20.00	14.29	9.90
Delhi	46.21	65.11	70.26	80.00	79.36	0.00	59.05
Goa	3.38	4.35	8.48	0.00	4.90	0.00	4.09
Gujarat	39.54	48.37	20.64	12.16	12.93	0.00	44.18
Haryana	47.50	27.91	45.10	50.91	59.05	0.00	48.85
Himachal Pradesh	5.99	4.96	7.70	3.73	5.31	0.00	5.65
Jammu & Kashmir	1.28	2.72	4.49	0.00	1.00	0.00	1.99

Jharkhand	3.30	7.55	8.10	6.57	3.39	0.00	4.27
Karnataka	7.84	21.09	15.77	14.32	14.34	1.75	14.21
Kerala	32.72	39.53	38.14	23.91	27.84	2.42	32.92
Lakshadweep	38.46	72.73	66.67	100.00	100.00	0.00	60.00
Madhya Pradesh	17.16	14.48	17.46	16.70	20.03	0.34	16.69
Maharastra	73.60	69.87	15.10	28.72	9.16	5.70	59.19
Manipur	1.05	2.10	3.32	2.13	0.00	0.00	1.48
Meghalaya	2.19	3.63	1.74	1.23	1.94	0.00	2.09
Mizoram	12.63	6.78	15.52	9.31	9.09	0.00	11.03
Nagaland	3.65	3.70	3.45	5.83	3.15	0.00	2.82
Orrisa	7.12	12.07	9.38	6.22	4.16	3.15	8.09
Puducherry	24.59	21.67	19.81	50.00	32.10	0.00	24.19
Punjab	12.93	8.04	10.73	12.99	13.39	0.00	12.65
Rajasthan	9.81	16.58	19.02	16.90	18.81	0.00	12.59
Sikkim	3.78	6.21	6.08	0.00	0.00	0.00	4.47
Tamilnadu	15.31	27.87	16.69	16.85	0.00	0.00	17.77
Tripura	15.81	28.76	38.67	0.00	49.30	0.00	24.01
Uttar Pradesh	12.93	10.56	11.27	11.75	7.51	0.11	12.39
Uttarakhand	6.63	4.93	7.33	5.96	1.63	0.00	5.96
West Bengal	8.79	10.94	8.65	12.54	8.51	0.49	8.85
All Districts	15.65	26.19	18.05	12.78	13.32	2.78	17.14

Source: NUEPA Study

education into several independent tasks and those tasks which need interaction with the community and other professional bodies should be handed over to local NGOs.

- Development of alternative learning material, teachers' handbook and guidance in managing these children is a very crucial input for inclusive education. Any visit to a typical primary school reveals that none of this pedagogic support is made available. The question is why SSA does not consider it a priority issue.
- On-going programmes for professional development of teachers including workshops to provide an opportunity to discuss mutual problems of handling disabled children will go a long way. State Council of Educational Research and Training, (SCERT), District Institute of Education and Training (DIET), sub-divisional and block level agencies such as Cluster Resource Centre (CRC) and Block Resource Centre (BRC) should look into it.
- It is important to look at the types of disabilities which are existing in certain schools in every state and union territory. The implication is primary teacher training programmes both pre-service and in service need to cater to training in handling at least two disabilities. The data about these teachers should be made available to the administrators in the states. This should be a major consideration in transferring teachers across schools by posting teachers trained in one or two disability to those schools where children with these two disabilities are dominant.
- Networking with women and child development department and health services is crucial for inclusive education. This has not been the main agenda of policy makers. A typical primary school in rural area does not have any data on the number of disabled children and nature of disability coming under its jurisdiction. The Primary Health Centre (PHC) also does not have this data. The Panchayat Raj Institutions (PRI) is not sensitive to this. More than all this, there is no coordination with the ICDS programme. In fact, if this coordination exists, the implementation is very smooth. A primary school should know how many disabled children with nature of disability are already enrolled in the ICDS programme (0-6 years) and this should help the schools to plan for their smooth transfer to regular schools in the subsequent academic year. Correspondingly, the PHCs with this data should be able to provide the medical intervention and work closely with the schools.

- Providing support services for disabled children is an important intervention in making inclusive education a success. To illustrate, blind children need education on brail, software available for blind children, software for the hearing impaired children and other self-learning materials. In addition to this, appropriate devises for the physically handicapped children would not only provide an incentive for them to enroll in schools but would motivate them to remain and learn. Significantly this will bring about a substantial attitudinal change among the teachers and help them to invent creative methods of providing individualised instruction.

Conclusion

The Government of India should carry out evaluation studies to obtain first hand information about the status of inclusive education. Disabled children have a fundamental right to education along with normal children. Mere access to schooling is not universalisation. They have to receive quality education and the retention and achievement levels have to be improved to a great extent. The physical facilities in schools including ramps, trained and high quality teachers including female teachers are the need of the hour. It is high time that every one working in the area of inclusive education pay attention to these issues.

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Attitudes of Administrators of Vocational Education Institutions in relation to certain Personal and Demographic Variables

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ABSTRACT

This paper presents an in-depth study of deficiencies, hurdles and conflicts in the existing system of vocational education in the state of Andhra Pradesh. The sample of the study comprised of 84 institutes, which consisted of 24 High Schools, 24 Junior Colleges, 24 Industrial Training Institutes and 12 Polytechnic Colleges and 100 Administrators. For knowing the attitude of administrators an attitude scale was developed by the investigators. A three stage stratified random sampling technique was used. The results of the study revealed that administrators are not happy with the prevailing situation in the field of vocational education. Further, a large number of subjects expressed their inclination to have a separate independent stream of vocational education instead of incorporating vocational courses in the institutions of general education. Hence, it is necessary that the government and the managements involved in the process of vocationalisation should plug the loopholes and eliminate the deficiencies so that ideal vocational education may be provided in tune with the demands of the present day society.

Introduction

The attainment of independence ushered in a new era of national development with determination to eliminate the poverty of the people and to ensure reasonable standard of living for all. Modernisation

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and rapid development of industry required skilled personnel in various new fields, who would become instruments of social transformation and economic progress.

Although a large number of educationists recommended incorporation of vocational element in the formal system of schooling throughout the world, very little has been achieved in this direction. In India the modern educational system was developed on the basis o British system of education. One such change is vocationalisation. The father of the nation, Gandhiji, propounded the Basic Education in 1937 (Wardha Scheme of Education). In 1952-53 Modaliar Commission suggested multipurpose education (Vocational Courses) in 12+3 system of education. In 1964 the Education Commission recommended Work Experience in 10+2+3 system and Iswar Bhai Patel Committee in 1977 slightly modified the concept and recommended 'Socially Useful Productive Work'. *The National Policy on Education* (1986) recommended introduction of vocational programmes at Senior Secondary Level, Intermediate Level and restructuring of job-oriented courses at the first-degree level. Inspite of all these efforts, the progress towards vocationalisation of education has not been satisfactory and in tune with the manpower requirements of the economy.

What led to the failure of the attempts at vocationalising our education? Was it because of the conflict between the ideals of the policy makers and the aspirations of the people or that of between the theory and practice? The meager research conducted in this area reveals tht poor curriculum, untrained teachers, negligible exposure to practical and skill-oriented activities, lack of facilities, insufficient financial support, etc., were the most important causes for failure in vocationalising our education. Hence, the present study was undertaken to examine the causes of the failure in this area.

Objectives of the Study

The main objectives of the study were:

1. To study the attitude of the administrators towards different aspects of the vocationalisation of education.
2. To note the variations in the attitude of administrators towards vocationalisation of education across personal and demographic variables.
3. To make recommendations for the improvement of vocational education at all levels in the state under review.

Hypotheses of the Study

1. The administrators in general do not possess positive attitude towards different aspects of vocationalisation of education.
2. The personal and demographic variables of administrators do not influence their level of attitude towards different aspects of vocationalisation of education.

Variables included in the Study

As the present research was concerned with the study of vocational education institutions in relation to certain personal and demographic variables on the basis of the attitude of administrators, the dependent and independent variables included in the investigation are as follows:

Dependent Variable

Attitude of administrators toward different aspects of vocationalisation of education.

Independent Variables

The independent variables considered in the investigation are sex, age, level of association, type of management, locality, type of institution, medium of instruction, teaching experience and exposure to in-service training programmes.

Method

The present study was a survey type of research. The various procedures adopted in the construction and standardisation of data gathering instrument to measure different variables included in the study and the methods followed in selection of the sample, collection of the data, scoring and analysis are as follows:

Tool Used

A five-point attitude scale with 86 items for the administrators to know their attitude towards vocationalisation of education was developed. It was done so following all the steps included in the construction of attitude scale, viz. collection of items from different sources, preparation of item pool, scrutiny of the items by the experts, preparation of pilot form, pilot study, item analysis, selection of items

for final study, establishment of reliability and validity, etc. In this tool the items regarding personal and demographic variables were also incorporated to collect the relevant information.

Sample

The study was conducted in the State of Andhra Pradesh. Geographically Andhra Pradesh State is divided into three regions, viz., Coastal Andhra, Telengana and Rayalaseema. By selecting one district from each region at random the three regions were covered at the first stage of sampling.

At the second stage, educational institutions, which provide vocational education in each region, were sampled. There are several types of vocational institutions like High Schools with vocational courses, Junior Colleges with vocational courses, Industrial Training Institutes and Polytechnics. The first two types are institutions of general education and also providing vocational courses whereas the latter two types of institutions are exclusively meant for providing vocational courses. Keeping this in view and to give representativeness to all categories, 8 High Schools, 8 Junior Colleges, 8 Industrial Training Institutes and 4 Polytechnics were selected at random, treating them as a sampling unit. Thus, from each region 28 institutions of the four types and in total 84 institutions were included in the sample.

At the third stage, the sampling units were administrators. The sample consisted of 100 administrators selected from heads of institutions and district, regional and state officials, who were incharge of vocational education by following the cluster sampling technique. Thus, the sampling techniques employed in the investigation may be called as a three stage stratified random sampling technique.

Collection of the Data

The investigator personally visited all the institutes in the sample. The administrators were given copies of the instrument and requested to respond to all parts of the instrument without leaving any single question.

Scoring of the Responses

As the instrument used in this investigation was the Likert's type of attitude scale on a five-point scale it was been scored by giving weights

5, 4, 3, 2 and 1 in the case of positive items and 1, 2, 3, 4 and 5 in the case of negative items, respectively. The grand total to each individual on the entire scale was obtained by adding the weights on all the statements. The information provided by the respondents in the personal data sheet was numerically coded to suit the computer analysis.

Analysis of Data

As the data thus collected is qualitative in nature, item-wise analysis was carried out to identify the specific deficiencies in different aspects of vocationalisation of education.

Statistics such as frequencies, percentages and Chi-square were employed to make the qualitative description more precise.

The total scores obtained by all the subjects were carefully analysed employing appropriate statistical techniques such as mean, median, mode, quartile deviation, standard deviation, skewness and kurtosis, etc.

To test different hypotheses, the inferential statistical techniques such as 't' test and 'F' ratio were employed.

Results

(*i) Description of the Distribution of Administrators' Attitude Scores*

TABLE 1
Distribution of Attitude Scores of Administrators

Class Interval	*Mid Values*	*Frequency*	*Smoothed Frequency*	*Cumulative Frequencies*
190-199	194.5	5	5.67	5
200-209	204.5	12	8.00	17
210-219	214.5	7	11. 00	24
220-229	224.5	14	12.00	38
230-239	234.5	15	15.67	53
240-249	244.5	18	13.34	71
250-259	254.5	7	12.34	78
260-269	264.5	12	7.67	90
270-279	274.5	4	6.67	94
280-289	284.5	4	3.00	98
290-299	294.5	1	1.67	99
300-309	304.5	0	0.34	99
310-319	314.5	0	0.34	99
320-329	324.5	1	0.34	100
		N = 100		

Mean	=	238.00	Q.D.	=	17.50
Median	=	237.50	S.D.	=	25.55
Mode	=	236.50	Sk.	=	0.02
Range	=	131.00	Ku.	=	3.63

Table 1 shows that the mean scores obtained by the sample is 238.00, which is less than the average level (86 3 = 258) on the scale. The values of median and mode also indicate that the general level of attitude towards vocationalisation of education is far less than the average level. Hence, it can be concluded that the administrators, in general, do not possess positive attitudes on different aspects of vocationalisation of education'. As the measures of the central tendency are in the descending order, the distribution is said to be slightly skewed. Of course, it is evident from the calculated value of skewness (0.02) that the distribution is skewed at negligible level. The value of kurtosis 3.63 discloses that the distribution is slightly platy kurtic.

The range of the distribution of scores is 131.00 (highest score = 325 and lowest score = 194). Quartile deviation and standard deviation are 17.50 and 25.55 respectively. These measures of dispersion reveal that the spread in the distribution is almost normal. The relationship between quartile deviation and standard deviation as exists in normal probability curve (2/3 SD = Q.D. i.e. 25.55 2/3 = 17.50) is almost observed in the distribution and therefore, it can be said that the distribution belongs to the family of normal curve. As the distribution of administrators' attitude scores follows normality with marginal exceptions, it is feasible to apply all the parametric statistics in the analysis of data.

(ii) The Influence of Personal and Demographic Variables on the Attitudes of Administrators

The sample was divided into different sub-groups based on their personal and demographic variables to see whether there existed any significant difference among the groups in their attitude towards vocationalisation of education. Each of the ten variables was studied independently to test the hypothesis.

Gender

Results showed that there was no difference in the attitude of male and female administrators (Mean for male = 243.74, Mean for female = 243.43, $\underline{t}$ = 1.57, $\underline{P}$ >.05).

Age

The mean attitude score of administrators aged 36-45 years was higher (Mean = 244.57) than the administrators of age groups 45 and above (Mean = 234.98) and up to 35 years (Mean = 224.24). The differences in the mean scores were significant (F = 3.63, P < .05).

Teaching Experience

The mean attitude score of administrators who were experienced 15 years and above in teaching was higher (Mean = 240.02) than the administrators of 6-15 of teaching experience (Mean = 238.73) and up to 5 years (Mean = 224.20). The differences in the mean scores were not significant (F = 2.48, P > .05).

Level of Association

The mean attitude score of administrators who were associated with Polytechnic Colleges was higher (Mean = 255.36) than the administrators who were associated with ITIs (Mean = 237.30), Junior Colleges (Mean = 231.55) and High Schools (Mean = 232.33). The differences in the mean scores were significant (E = 5.64, P < .01).

Type of Association

Administrators associated with ITIs and Polytechnic Colleges have more favourable attitude (Mean = 243.87) towards vocationalisation of education than those associated with High Schools and Junior Colleges (Mean = 231.94). t = 2.67, P <.05).

In-service Training Programmes

The mean attitude score of administrators who were not attended in-service training programmes was higher (Mean = 240.72) than the administrators who attended long back (Mean = 235.80) and who attended recently (Mean = 238.50). The differences in the mean scores were not significant (F = 0.30, P > .05).

Locality

There was no difference in the attitude of urban and rural administrators (Mean for urban administrators = 235.63, Mean for rural administrators = 239.68, t = 0.78, P > .05).

Type of Management

The mean attitude score of administrators who were associated with government institutions have secured a better mean score (Mean = 238.45) than those who were associated with aided institutions (Mean = 233.78) and unaided institutions (Mean = 233.06). The differences in the mean scores were not significant ($F = 0.39$, $P > .05$).

Medium of Instruction

The mean attitude score of administrators who were associated with English medium have secured higher (Mean = 250.32) than the administrators of Telugu medium (Mean = 237.29) and the administrators of both media (Mean = 228.63). The differences in the mean scores were significant ($F = 4.67$, $P < .01$).

Type of Institution

Further, there was no difference in the attitude of administrators who were associated with single sex and co-educational institutions (Mean for single sex = 237.54, mean for co-education = 237.12, $t = 0.06$, $P > .05$).

Major Findings

The major findings arrived at have been presented under three headings viz., findings based on item-wise analysis, description of the distribution of scores and influence of other variables included in the study.

Findings Based on Item-wise Analysis

On the basis of the administrators' attitudes it has been found that the following aspects are quite disturbing:

- 89% of the administrators felt that the vocational courses introduced at different
- Levels in different institutions have no proper interlinkages.
- About 82% administrators opined that the vocational courses of education are not suited to the structural changes in the economy and hence leading to educated unemployment.
- 72% of the administrators accepted that there is a scarcity of trained experts in the field of vocational education.

- 89% of the respondents have expressed their inclination to have a separate independent stream of vocational education instead of incorporating vocational courses in the institutions of general education.
- 96% of the administrators felt that there is no provision for in-service training programmes.
- 74% of the administrators are of the opinion that there should be a separate apprentice board.
- 87% of the administrators expressed that vocational education institutions are not able to run successfully due to dearth of trained personnel.
- 66% administrators disclosed that the available teachers have neither practical experience nor well-trained, hence they have not been able to develop necessary skills among students.
- 83% of the administrators expressed that there are no promotional opportunities for teachers working in vocational education institutions.
- 78% of the administrators opined that vocational education teachers are not suitably rewarded for their efforts.
- 92% of the administrators expressed that there is no coordination between vocational institutions and local industries.
- 46% administrators disclosed that the syllabus in the vocational education courses is heavy.
- 59% of the administrators expressed that the society in general and the teachers of general education in particular do not show any respect to the staff of vocational courses.
- 88% administrators felt that the placement service centres are not available in vocational education institutions.
- 77% of the administrators accepted that the curricular activities have not been conducted uniformly in different institutions.
- 82% administrators expressed that the curriculum has not been revised in accordance with the changing times.
- According to 92% of the administrators latest equipment is not available in vocational education institutions.
- As many as 76% of administrators have expressed that the practical manuals are not sufficiently available in vocational education institutions' libraries.

- 75% administrators revealed that there are not facilities like vocational guidance.
- 95% of the administrators disclosed that there is no positive outlook in the society on lower level vocational courses and media is not trying to inculcate positive thinking among the people towards vocational education.
- About 81% of the administrators revealed that suitable teaching aids are not available to the teachers.
- 75% administrators observed that the supervisory staff to monitor the programme has been inadequate.
- 93% of the administrators felt that there are no suitable textbooks either in English or Telugu medium.
- 77% of the administrators revealed that the conduct of the practical examinations by engaging part-time teachers is highly disappointing.

Findings Based on Description of the Distribution of Scores

- The distribution of attitude scores of the sample indicated that the attitude scores obtained by administrators are not having positive attitude towards vocationalisation of education. (Mean=238.00, Median=237.50 and Mode=236.50 which are at lower level than the average point of the scale, 86 3=258) which means different issues related to the existing vocational education are not favourable to them.

Findings Based on Influence of Personal and Demographic Variables

- With regard to the administrators three personal and demographic variables could significantly influence their level of attitude towards vocationalisation of education. They are age, level of association and medium of instruction.
- Both young (up to 35 years) and old administrators (45 and above) possess less favourable attitude towards vocationalisation of education (224.24 and 234.98) than those of the middle age group (36-45 years). (244.57).
- The administrators associated with the institutions of general education have exhibited significantly less favourable attitude

towards vocationalisation of education than those associated with separate institutions of vocational education. (231.94 and 243.87).

Educational Implications of the Study

- The policy makers and curriculum planners have been experimenting with the restructuring of the courses at the first degree level to incorporate vocational/occupational opportunities in general education. In other words they are called job-oriented courses they include subjects like sericulture, aquaculture/ fisheries, dairy technology, industrial chemistry, bio-technology, etc. Instead of running these courses in the institutions of general education it is better if they are run in separate institutions in the area where there is employment potential.
- Indian education has the inherent character of vertical linkages for the progress of a student from the lower level to the higher level in general education stream. It is also necessary to develop such kind of linkages in the major stream of vocational education. There is no need to restrict the entry to different professional courses only to those who acquire a specified qualification in general education. For example, the system allows intermediate students to get admission to M.B.B.S. course. Why not a physiotherapist or a nurse or a para medical assistant is eligible for admission to M.B.B.S. course? If we specify a minimum level of general education for entry in to professional courses why not we specify a minimum level of vocational education for the entry into the related professional education? This kind of inter linkages at different levels of vocational/technical/professional courses is the need of the day. The society in general does not exhibit any unfavourable attitude towards the vocational programmes even at the lower level.
- Keeping in view the above points and examples it would be possible to develop vertical linkages meaningfully among vocational/technical/professional courses. For example, an electrician who is trained in house-hold wiring should be allowed to become an electrical engineer provided that he/she fulfills the minimum required level of qualification in terms of vocational education. Then the parents may not hesitate to send their children to vocational courses at the lower level.
- The courses that are devised in the field of vocational/technical stream should have social relevance. The structural changes in

the economy, the priorities given in our development plans, the local agriculture and industrial needs and the interests of the people should form as the basis for designing a variety of vocational and technical courses.

- Any innovative work will be successful only when the course material is prepared well and made available in the market in any language. If not we are sure to get a bitter experience of failure (as in the case of B.C.A.). Without the necessary study material, well-trained teachers, library and laboratory facilities we have been expanding our education by introducing new courses both in general and vocational/technical education. This is not a good sign. Developing an appropriate curriculum, preparing revised study material, producing sufficient number of trained teachers, increasing necessary infrastructural facilities including academic inputs such as laboratory, library, worksheds and field experiences, etc., are the essential steps involved in making any programme of education qualitatively attractive.
- The vocational and the lower level technical courses are mostly related to the production of semi skilled persons with lower abilities both in the general education and the vocational education. They need to be given more practical oriented education, which helps them develop the required skills to perfonn the given task independently. But unfortunately most of the vocational courses which are being conducted aims at providing the theoretical knowledge only about the trade or vocation and not the practical orientation. Because of this reason the students who complete vocational courses are unable to stand on their own and the public in turn have lost faith in vocational education.
- For over decades, many attempts have been made to emphasis that there should be close association between industries and vocational education institutions. The apprenticeship act was more rigorous earlier than today; the field experience was more effective in the past. The curricular activities both under theory and practical should be specified explicitly to make curriculum effective and purposeful.

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Research Notes

A Study of the Utilisation of Educational Media at Primary Stage

SARAT KUMAR ROUT*

ABSTRACT

This study examined the existing status and utilisation of educational radio and television programmes produced by Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT) New Delhi and broadcasted through Gyan Vani (educational FM radio channel) for Educational Radio(ER) programmes and DD-1(National TV Channel), Gyan Darshan (Educational free cable channel) for Educational Television(ETV) programmes respectively. A sample of 60 schools run by Municipal Corporation of Delhi (MCD) was randomly selected from three educational zones in Delhi. Views and opinions on the utilisation of educational radio and television programmes were collected through questionnaires and opinionnaire. The results revealed that only 50 per cent schools have been utilising educational radio programme while 27 per cent schools have been utilizsing educational television programme. Further, regularly/occasionally listening and viewing schools of these media were unsystematic in the process of utilisation. It was found after close scrutiny of collected data from the headmasters/headmistress (H.Ms), teachers, students and informal observation done by the investigator that the genuine cause of non-utilisation of educational mass media was apathetic attitude of the teachers than anything else, though they showed positive attitude towards them on pen and paper. The attitude of schools regularly/occasionally utilising (listening and viewing) media programme were found to be casual.

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Introduction

During first half of the last century, the printed and written word alone reached millions of unreachable students. The advent of digital convergent media like telecommunication, radio transistor and then the television made the whole process easier, faster and easy access of information and also encouraged interactivity and interconnectivity. It has become now possible to spread education of better quality education to masses with minimum cost. The main function of education is communication of knowledge, skills and attitudes. The mass media have great potential in communicating it effectively. Formal educational setting, where teaching is merely a function of passing of knowledge, the main aim is to transmit the message in a form which facilitates the student to grasp it, understand it and share it. Audio-visual aids can contribute enormously to a communication process of its nature by making the subject matter more easily accessible and by increasing the retention factor. The students' opportunities for learning can be increased and enhanced by using a wide range of instructional aids. Therefore, radio and television as an instructional medium can play an instrumental role in accomplishing the goals of effective and systematic teaching.

The educational mass media, namely radio and television, can play important role in India to counter attack its problems and limitations particularly in the area of primary education like low enrollment, high dropout, stagnation, low achievement, poor standard of living, resource crunch, poor training facilities for teachers, lack of motivation among teachers, parents and community, unattractive instructional process, etc. On the other hand these media could be booster to address the emergent needs to provide increased access of quality education in formal and non-formal systems. *The National Policy of Education* (NPE, 1986) rightly remarked that *Modern communication technologies have the potential to bypass several stages and sequence in the process of development encountered in earlier decades. Both the constraints of time and distance at once became manageable. In order to avoid structural dualism, modern educational technology must reach out to the most distant areas and the most deprived sections of beneficiaries simultaneously with the areas of comparative affluence and ready availability.* Increasing realisation that these media could contribute to the attainment of learning provides an impetus to greater utilisation of them.

Justification of the Study

The function of radio and television as a medium for classroom instruction has completed nearly 77 years and 46 years in India, respectively. Research studies conducted on utilisation of educational radio revealed the poor utilisation of school broadcast programmes (AIR,1964; AIR, 1972; Basu,1996; Biswal,1981; CIET, 1980; CIET, 2004; Goel,1980; Kumar,1954; Mohanty and Giri;1976; Muhkapadya,1993; Nagaraju,1982; Sesharatnam,1994; Shukla, 1977). Similarly, studies conducted on utilisation of educational television (ETV) programmes revealed that ETV programmes actually remained under- utilised (Shah, 1977; CIET, 1992; Chaudhary, 1991; Behera, 1995; Singh and Singh, 1983; Sharma, 2003; Reddi, 1996). The common reasons of such sorry state of affair include: (i) non-availability of programme schedule; (ii) lack of interest of custodian teachers; (iii) overloaded syllabus and paucity of time to complete the prescribed courses; (iv) non-functioning radio and TV sets; (v) lack of correlation between the school broadcast programme and monthly scheme of studies; (vi) poor maintenance of TV sets; (vii) erratic power supply, etc. Further analysis of review indicates that more studies on effectiveness and less studies on utilisation aspects were conducted in India. Nearly 90 per cent studies were conducted during the time of Satellite Instructional Television Experiment (1975-76) and Indian National Satellite Project (1983-84). Major changes in the field of educational technology took place after 1986 when the new Educational Technology (ET) scheme was launched by Government of India as a follow up to NPE, 1986 with a view to enhance the reach and quality of education provided to a large number of learners**.** Major recommendations of NPE (1986) and its Programme of Action (POA), 1992 made an impact on the production and utilisation of mass media. These include national level intervention of media inputs for spread of quality of education like (i) granting autonomous status was given to seven State Institutes of Educational Technology (SIETs) located in Uttar Pradesh, Bihar, Orissa, Gujarat, Maharashtra, Andhra Pradesh and Karnataka for production of educational media programmes for school children in their respective regional language; (ii) distribution of 2,56,566 Radio-cum-Cassette Players (RCCPs) and 37,129 Colour Televisions (CTVs) in primary schools under the Educational Technology (ET) scheme; (iii) launching of India's first truly dedicated educational TV channel, Gyan Darshan on January 26, 2000 by the Ministry of Human Resource Development (MHRD) and Prasar Bharati with Indira Gandhi

National Open University (IGNOU) as the nodal agency; (iv) launching of Gyna Vani in November 2001, an educational FM radio channel, operating through several FM stations from various parts of the country, and (v) commissioning of dedicated satellite system for education EDUSAT in the air on 26th September 2004. With regard to this scheme the Parliament Standing Committee on MHRD in its 46th Report on demands of grant inter-alia recommended as under: *"The committee is constrained to observe that CTVs and Computer supplied by the government to the schools are not being utilised effectively. The committee, therefore, recommends that effective evaluation be made each year and physical achievements as per targets may be brought out also"* (CIET, 2004).

Forgoing discussion shows that at planning and policy making level, continuous efforts have been initiated to materialise the goals of NPE-1986 and its Programme of Action (POA) 1992 for better utilisation of educational radio and television in schools. It is, therefore, imperative to know the extent to which educational media are utilised in school in the country. What are the factors responsible for the effective use? Whether factors, responsible for non-utilisation of educational media are perennial or a new factor replaced old one? How do the clientele react to educational media?

In order to answer the above questions, a series of studies of different nature focusing on the varied aspects and dimensions of educational media is the need of the hour. The study under investigation is one such attempt.

Objectives of the Study

The following objectives were formulated in the present study.

(1) To study the extent of utilisation of educational media programmes at primary stage.

(2) To study the utilisation process of educational media programmes,

(3) To study the causes of non-utilisation of educational media programmes.

Delimitations of the Study

The study has been delimited in its scope as given below:

(1) The study was confined to Class-V students, Headmasters/ headmistress (H.Ms) and teachers of primary schools run by Municipal Corporation of Delhi (MCD).

(2) The study was restricted to educational radio programmes broadcast in Gyan Vani (educational FM radio) and educational television programmes telecast at DD-I (National television channel) and Gyan Darshan (Educational free cable channel).

(3) The study was concerned only with educational radio (ER) and educational television (ETV) programmes produced and relayed by CIET (NCERT) New Delhi.

Method

The study was intended to find out utilisation status of educational mass media at primary school stage. Therefore, normative survey method was employed.

Population and Sample

All headmasters/headmistress, teachers and students of MCD primary schools in Delhi state having Radio-cum-Cassette Players (RCCPs) and Colour Televisions (CTVs) facilities constituted population for the present study. Keeping in view the delimitation, the sample for the present study was drawn in two phases.

(I) Sample for First Phase of Study

In the first phase of study, three educational zones namely, Najafgarh Zone, Rohini Zone and South Zone, out of twelve educational zones in Delhi were randomly selected. Further, 20 schools were randomly from each of the three zones, where both RCCPs and CTVs facilities were availed, thereby selecting a total sample of 60 schools. In this way, all the H.Ms (60) and two teachers from each school (120) were included in the sample.

(II) Sample for Second Phase of Study

On the basis of data collected in the first phase it was found that 30 schools utilising RCCPs and 16 schools were utilising CTVs. Therefore, to study the third objectives, i.e. utilisation process of educational media programmes, only the response of the H.Ms, teachers and students of these listening and viewing schools were taken into consideration. In all, 30 H.Ms, 60 teachers and 300 students (10 students from each school) were covered. Further, 16 H.Ms, 32 teachers and 160 students were included in the sample to study the utilisation process of CTVs.

Tools Used

The following three tools were developed and used.

1. Questionnaire for the Headmasters/Headmistress

The questionnaire for the H.Ms comprised of 13 questions on the aspects and sub-aspects like background of the schools, information on media facility in the school, functioning of educational media programmes, provision for time table, maintenance of radio and television sets, etc. Further, questionnaire was divided into two sections. Section-I consisted of seven questions relating to the extent of utilisation and causes of non-utilisation of educational media and section-II contained six questions relating to the process of utilisation.

2. Questionnaire for the Teachers

Questionnaire for the teachers comprised 21 questions on the same aspects and sub-aspects used for the H.Ms along with some new sub-aspects such as supply of broadcast and telecast schedules in advance, information about educational media programmes, instructional activities conducted by the teachers during the time of listening and viewing of the programmes, etc. Further, questionnaire was divided into two sections. Section-I consisted of seven questions relating to extent and causes of non-utilisation of educational media programmes and section-II consisted of 14 questions relating to the process of utilisation.

3. Questionnaire for the Student

Questionnaire for the students comprised 16 questions on identified areas such as information about the availability of media facility at school, activities conducted by the teachers during the time of listening and viewing of educational media programmes, information about the listening and viewing conditions and timings of broadcast and telecast, preference of school subjects by the students, etc.

Procedure

The researcher personally visited all the schools spread in three educational zones and administered questionnaires and opinionnaires on H.Ms, teachers and students for collection of relevant information. The information collected were tabulated and analysed by using simple descriptive statistics, i.e. computing percentages.

Results

On the basis of the analysis and interpretation of the results, the following main findings have emerged out of the present investigation.

I. Extent of Utilisation

Working Conditions of RCCPs and CTVs: About 78 % of the H.Ms of the schools reported that RCCPs were in working condition and about 40% of them reported that CTVs were in working condition. The remaining 22% of the H.Ms in case of RCCPs and 60% of the H.Ms in case of CTVs reported that these sets were not in working condition.

Utilisation of RCCPs and CTVs: About 50% of the H.Ms of schools admitted utilising RCCPs. Out of them 30% were using it regularly and 20% used it occasionally. On the other hand, only 27% of the H.Ms admitted utilising CTVs. Out of them 10% were used regularly and 17% used occasionally.

- *Availability of Transmission Schedule in Schools:* Not a single school had received transmission schedule from any agency as stated by the H.Ms and teachers.
- *Provision of Fund for Repair and Maintenance of RCCPs and CTVs:* Table 1 shows that cent per cent of utilising schools of RCCPs and CTVs have been repairing and maintaining sets regularly. For minor defects they have been managing funds from various sources, such as hobby fund, science fund, P.T.A fund and H.Ms fund. For major defects they were writing to zonal offices of MCD schools.

TABLE 1
Provision of Funds for Repair and Maintenance of RCCPs and CTVs

Media	*N=H.Ms*	*Yes*	*No*	*Sources of Funds*
RCCPs	60	30 (50)	30 (50)	Hobby Fund-12 (20) Science Fund-9 (15) P.T.A. Fund-5 (8) H.M.Fund-4 (7)
CTVs	60	16 (27)	44 (73)	Hobby Fund-9 (15) Science Fund-4 (7) P.T.A. Fund-3 (5)

(Number within parenthesis indicates percentage)

- *Supervision by the School Inspector:* It was found that in maximum schools (more than 85%) supervision was not done properly by the school inspector. Some teachers have also mentioned that they collect information by phone instead of coming to the schools. Further none of the H.Ms or teachers endorsed that school inspectors came to enquire about the functioning status/process of RCCPs and CTVs programmes.
- *Awareness of Educational Media Production Agency:* Though majority of the H.Ms admitted that they were aware of educational media service, but less than 40% of them correctly mentioned the title and name of broadcast and telecast channel. As far as teacher's responses were concerned, 70% of the teachers admitted that they were aware of educational media. Nearly 50% and 43% of them correctly mentioned the title and name of broadcast and telecast channels, respectively. Further 18% of the H.Ms and 36% of the teachers could correctly respond name of the production agency.
- *Participation in Seminar or Orientation Programmes on ER and ETV:* Small percentage (33%) of the H.Ms have attended seminar and orientation programme.
- *Educational Media User-Teachers Training:* Small percentage (23% and 18%) of the teachers have attended user teachers training on ER and ETV programmes, respectively.
- *Contribution of the Teachers in Production Process:* Majority of the teachers were not involved in production process of ER and ETV programmes. Only a few percentage (8%) of the teachers were involved in writing educational radio script.

II. Utilisation Process

(i) Response of the H.Ms and Teachers

- *Purpose of Utilization of RCCPs and CTVs Sets:* All the H.Ms of the utilising schools of RCCPs and CTVs responded that they have been utilising these for listening and viewing to the content-based educational media programmes. This was further corroborated by 95% of the teachers of the same schools as well, whereas five per cent of the teachers of the utilising schools did not respond about the purpose of utilisation of RCCPs and CTVs. It is a positive feature to note that cent per cent of the H.Ms of the utilising schools of RCCPs and CTVs have been using these sets for the

purpose of listening and viewing to the content based educational media programmes.

- *Provision of Separate Period in the Timetable:* The data on accommodation of the broadcast and telecast programmes in school time table is given in Table 2(a) and (b).

TABLE 2 (A)
Provision of Separate Period in the Timetable for Listening of ER Programmes

Respondents	*N*	*Yes*	*No*	*Display of Timetable on the Notice Board*	
				Yes	*No*
H.Ms	30	13 (43)	17 (57)	5 (17)	8 (26)
Teachers	60	24 (40)	36 (60)	12 (20)	12 (20)

(Number within parenthesis indicates percentage)

It may be seen from Table 2(a) that 43% of the H.Ms and 40% of the teachers of the utilising schools of RCCPs reported that they have a provision of separate listening period for ER programmes in the timetable. On further probing, only 17% of the H.Ms and 20% of the teachers reported that they are displaying it on the notice board. On the other hand, 57% of the H.Ms and 60% of the teachers of the utilising schools reported that they did not have any provision of separate listening period in the timetable. However, they have been arranging listening time by utilising the classes of other subjects.

TABLE 2 (B)
Provision of Separate Period in the Timetable for Listening of ETV Programmes

Respondents	*N*	*Yes*	*No*	*Display of Timetable on the Notice Board*	
				Yes	*No*
H.Ms	16	5 (31)	11 (69)	2 (13)	3 (18)
Teachers	32	8 (25)	24 (75)	3 (10)	5 (15)

(Number within parenthesis indicates percentage)

It is evident from the Table 2 (b) that 31% of the H.Ms and 25% of the teachers of the utilising schools of ETV programmes responded that they have provision of separate periods in the timetable for

viewing purposes. Further probing revealed that only 13% of the H.Ms and 10% of the teachers were displaying it on the notice board. 69% of the H.Ms and 75% of the teachers of the utilising schools of ETV programmes revealed that they have no provision of separate period for viewing purposes in the timetable. They also reported that the classes meant for other subjects are adjusted many a times while viewing ETV programmes without prior intimation.

- *Separate Room Facility for Listening and Viewing:* Information in this aspect was collected from the H.Ms and incharge teachers.

TABLE 3 (a)
Separate Room Facilities for Listening of ER Programme

Respondents	*N*	*Yes*	*No*	*Arrangement of Classes*		
				Respective Classroom	*Science Room*	*Computer Room*
H.Ms	30	-	60	27 (90)	02 (07)	01 (03)
Teachers	60	-	60	53 (88)	04 (07)	03 (05)

(Number within parenthesis indicates percentage)

Table 3 shows that cent per cent of the H.Ms and teachers pointed out the lack of separate room for listening of ER programmes. The data further indicates that about 90% of the H.Ms and 88% of the teachers of the utilising schools of ER programmes were arranging classes for listening in the respective classrooms. Nearly seven per cent of the H.Ms and equal percentage of the teachers reported that they were arranging classes for listening of ER programmes in science room. But only three per cent of the H.Ms and five per cent of the teachers responded that they have been arranging classes for listening of ER programmes in computer room.

TABLE 3 (b)
Separate Room Facilities for Viewing of ETV Programme

Respondents	*N*	*Yes*	*No*	*Arrangement of Classes*		
				Respective Classroom	*Science Room*	*Respective Class-room and Hall*
H.Ms	16	-	16	8 (50)	6 (38)	2 (12)
Teachers	32	-	32	17 (53)	11 (34)	4 (13)

(Number within parenthesis indicates percentage)

It is evident from the Table 3 (b) that none of the schools have separate room for viewing of ETV programmes. When asked about the arrangement of the class for viewing of ETV programmes, nearly 50% of the H.Ms and 50% of the teachers responded that they were arranging it in the computer room. Besides, about 38% of the H.Ms and 34% of the teachers reported that they have been arranging viewing classes in science room. The remaining 12% of the H.Ms and 13% of the teachers reported that they have been arranging it in the respective classrooms.

It is thus clear that none of the schools have separate rooms for listening of ER programmes and viewing of ETV programmes. Further, it has been observed that the utilising schools have been using different rooms, viz. respective classroom, hall, science room, computer room for listening and viewing the same.

- *Satisfaction of Teachers with the Listening and Viewing Conditions:* Majority (more than 88%) of the teachers were not satisfied with listening and viewing conditions of ER and ETV programmes due to small size of the classroom, noisy environment and small size of CTVs, shortage of speaker.
- *Maintenance of Records about Utilisation:* It may be noted that only seven H.Ms (i.e. 23%) produced the utilisation record of ER programmes as per the request of the investigator during the time of data collection. On the other hand, 37% of the H.Ms reported having maintaining the utilisation records of ETV programmes.
- *Organisation of Pre-broadcast and Telecast Activities:* About 15% of the teachers of the utilising schools of RCCPs have been organising pre-broadcast activities such as introducing topics, establishing rapport with the students, and providing information about content coverage. The remaining 85% of the teachers responded that they were not organising pre-broadcast activities. The main reasons of not doing so were non-availability of transmission schedule and overcrowded classroom.
- *Organisation of Post-broadcast and Telecast Activities:* About 60% of the teachers of the utilising schools of RCCPs have been organising post-broadcast activities, namely asking questions on key learning point, relating text to programmes and giving home work relating to programmes. The remaining 40 % of the teachers responded that they were not organising post-broadcast activities.

In case of CTVs about 31 % of the teachers of the utilizing schools reported that they have been organizing post-telecast activities, namely asking questions on key learning point, and relating text to programs. The remaining 69 % of the teachers responded that they were not organizing post telecast activities.

(ii) Response of the Students

- *Awareness about Educational Radio and Television Programmes:* A large majority (more than 90%) of the students were aware about ER and ETV programmes and its timings.
- *Interest of the Students in Listening and Viewing ER and ETV Programmers:* A large majority (More than 78%) of the students were interested in listening ER programmes and viewing ETV programmes. The reasons of such likeness were – it helps them to understand study matter, helps to gain more advance knowledge.
- *Preference of ER and ETV Programmes:* A large majority of the students preferred to listen ER programmes on language, moral stories, history and science. Majority (more than 50%) of the students preferred to view ETV programmes on science, history, themes related to geography, various forms of arts, moral stories and mathematics.
- *Place of Listening and Viewing:* Majority of the students were listening ER programmes while sitting on the bench in their respective classroom. On the other hand, majority of students view ETV Programmes by sitting on the floor covered with carpet in the computer room/common hall/science room.
- *Maintenance of Discipline of the Media Classroom:* Majority (more than 64%) of the students have reported about indiscipline in the class during the time of listening and viewing of ER and ETV programmes because of noise from the peer groups due to overcrowded classroom and interruption on part of the other teachers.
- *Need of Pre- and Post-broadcast and Telecast Activities:* More than 75% of the students felt the need for pre-broadcast and telecast activities. Similarly a large majority (more than 81%) of the students were in favour of post-broadcast and telecast activities
- *Note Taking by the Students:* Not a single teacher was encouraging children to take notes on important points while listening and viewing ER and ETV programmes.

- *Feeling of Loss:* Majority of the students were feeling loss of new ideas, if they were absent in educational media classes.

III. Causes of Non-utilisation

Non-utilisation of these media in places, where the infrastructure and other facilities are available, is a matter of concern. H.Ms and teachers of 50% and 73% schools admitted non-utilisation of RCCPs and CTVs for listening and viewing of ER and ETV programmes, respectively. When asked about the reasons for non-utilisation, the H.Ms, teachers listed various reasons (Table 4)

TABLE 4
Causes of Non-utilisation of ER Programmes

SI.No	*Causes*	*No. of H.Ms*	*No. of Teachers*
1.	Transmission schedule not made available	25 (83)	53 (88)
2.	Timetable already crowded	21 (70)	41 (68)
3.	TV set was out of order	28 (64)	55 (63)
4.	Difficult to organise listening by all students at the same time	18 (60)	40 (66)
5.	Radio set was out of order	17 (57)	36 (60)
6.	Teachers not oriented to the pattern of using radio in education	14 (47)	20 (33)
7.	Lack of synchronisation of radio lessons with classroom teacher	10 (33)	35 (58)
8.	Erratic supply of electricity	12 (40)	27 (45)

(Number within parenthesis indicates percentage)

It may be seen from the Table 4 that most important cause of the non-utilisation of educational media was non-availability of transmission schedule as stated by 83% of the H.Ms and 88% of the teachers. The next cause of non-utilisation was due to syllabus load which was responded by 70% of the H.Ms and 68% of the teachers. The next cause in descending order was the mechanical defects of CTV sets which was responded by 64% of the H.Ms and 63% of the teachers. The space of the classroom, where radio and TV sets were installed, was not adequate enough for the viewers. This has been stated as by 60% of the H.Ms and 66% of the teachers. Mechanical defects of radio did not allow its use as stated by 57% of the H.Ms

and 60% of the teachers. On the other hand, teachers were not oriented to the pattern of using radio and television in education, as stated by 47% of the H.Ms and 33% of the teachers. Lack of synchronization of radio and television lessons with classroom teaching was observed by 33 % of the H.Ms and 58% of the teachers. Erratic supply of electricity was cause for non-utilisation of ETV programmes as stated by 40% of the H.Ms and 45% of the teachers.

A closer scrutiny, however, showed that the underlying problem appeared to be more of lack of interest for use of RCCPs and CTVs than anything else. Some schools, nevertheless, had genuine difficulties, which included non-availability of programme schedule, trained personnel to repair the sets, separate room for listening and viewing, discouragement from parents, sets were out of working order, erratic electricity supply, lack of separate period and trained teachers to use it as medium of education, etc.

Suggestions for Proper Utilisation of Educational Media

1. Monthly transmission schedule prepared by CIET (NCERT) and IGNOU needs to attach guides notes, feedback schedules and scope of each programme besides day-wise programmes for different grades. It may be helpful to school teachers in integrating school broadcasts and telecasts into classroom instruction.
2. The first and the foremost steps towards the effective utilisation of the school broadcast and telecast service should be that the State and District Education Department may explicitly place due emphasis on the use of radio and television as a part of their educational pattern.
3. State Department of Education in cooperation with CIET needs to send the transmission schedules and feedback schedules to the schools.
4. State Department of Education should make a mandate for including school broadcast and telecast programme as a part of regular timetable.
5. New RCCPs and CTVs sets need to be provided to the utilising schools to handle the problem of multi-section of the students in a grade.
6. State Department of Education should provide adequate fund for maintenance of the sets and construction for separate building for media classroom/audio-visual classrooms.

7. CIET in collaboration with the State Department of Education should organise training and orientation programme for school inspectors and teachers, so that they can organise pre- and post-broadcast activities and answers the queries of the students.
8. The teachers and students may be given more chance to participate in the production of ER and ETV programmes, so that they would be encouraged to utilised the ER and ETV programmes effectively.
9. State Department of Education may organise workshop and seminar for teacher educators, so that they can persuade the pupil teacher during their pre-service training for using this programme when they will become teachers.
10. The School Inspector should provide proper guidance to schools on a regular basis on school broadcasts and help them to remove their difficulties on this aspect. They should take account of radio listening and television viewing in their inspection reports.
11. Grade-specific and stage-specific programmes needs to be broadcasted and telecasted.
12. CIET should avoid repeat broadcast and telecast ER and ETV programmes.
13. No deviation should be made in the programmes schedule without prior intimation to all concerned.
14. Stringent rules may be made for the cable operators for giving signal related to Gyan Darshan channel.
15. Circular must be passed by the State Government to Power Grid Corporation to supply power during the school broadcast and telecast timings.

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Incidence of Underachievement in the Secondary and Higher Secondary Schools of Kerala

REENA GEORGE* and MERCY ABRAHAM**

ABSTRACT

The distressing phenomenon of underachievement in school subjects is a matter of great concern among researchers and educationists. The study compares the incidence of academic underachievement, among 1,730 students in the Secondary and Higher Secondary Schools of Kerala. Composite Tests of Achievement in school subjects and Raven's Standard Progressive Matrices were the tools used. Regression analysis and Critical Ratio tests of significance were the statistical techniques employed. The study found that 15.26 per cent of students in the Secondary and Higher Secondary Schools of Kerala are underachievers in school subjects, 70.46 per cent are normal achievers and 14.28 per cent are overachievers. The proportion of underachievers is higher in the Secondary level than that in the Higher Secondary level. A higher proportion of female students are overachievers, whereas a higher proportion of male students are underachievers. The rural and urban sub-groups are homogenous with respect to the incidence of over, normal and underachievement.

Introduction

Academic underachievement, more than academic failure, constitutes a grave problem as it amounts to wastage of human resources, which should be construed as an irreparable loss to the society. Underachievement or lack of development according to one's capacity,

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is alarming and poses a special problem to all those who are interested in education.

Underachievement: Failure to work up to one's Potential

Poor performance in the absence of any discernible deficit in the structural apparatus required for learning is commonly described as *underachievement*. While high and low achievement refers only to above and below average achievers, the concept of over and underachievement takes into account the academic achievement in relation to the intellectual level of the individual. Thus, underachievement can be understood as the discrepancy between intelligence test scores and achievement test scores. For any intelligence level, if a person achieves below what is expected of him, he is usually called an *underachiever*. Underachievers are typically defined as pupils who perform significantly less well in school than would be predicted from their performance on measures of learning ability, intelligence, or in some cases, past achievement. Underachievers are students who possess good or high potential and show a discrepancy between their potential and actual achievement. Good (1945) defines an underachiever as "one whose academic achievement is significantly below the level expected of him on the basis of his assessed intellectual potential". Thus, academic underachievement may be defined operationally as the actual academic achievement falling short of the expected or potential academic achievement. The incidence of underachievement varies with the school subjects under study and probably with differences in samples.

Objectives

It is commonly observed that many students at the Secondary and Higher Secondary level underachieve in different school subjects. The present investigation was aimed at finding out the incidence of underachievement among students in the Secondary and Higher Secondary Schools of Kerala. The specific objectives of the study were:

1. To identify the underachieving students in the Secondary and Higher Secondary schools of Kerala, using Regression equations.
2. To compare the incidence of over, normal and underachievement among students in the Secondary and Higher Secondary levels of Kerala.

3. To find out whether there is significant difference in the proportion of male and female sub-samples of over, normal and underachieving students in the Secondary and Higher Secondary schools of Kerala.
4. To find out whether there is significant difference in the proportion of rural and urban sub-samples of over, normal and underachieving students.

Sample

The sample comprised of 1,730 students selected from Secondary and Higher Secondary Schools of Kerala.

Tools

The tools used for the study were: Raven's Standard Progressive Matrices Test of Intelligence (Raven et. al., 1998), Composite Test of Achievement for Standard VIII; Composite Test of Achievement for Standard IX; Composite Test of Achievement for Standard X; Composite Test of Achievement for Standard XI (*Science Group);* Composite Test of Achievement for Standard XI (*Humanities Group*); Composite Test of Achievement for Standard XI (*Commerce Group)*; Composite Test of Achievement for Standard XII (*Science Group);* Composite Test of Achievement for Standard XII (*Humanities Group);* and Composite Test of Achievement for Standard XII (*Commerce Group),* developed by George (2004).

Analysis and Findings

The investigation was designed as a *descriptive study* and *normative survey* was followed for gathering the data essential for the study. Data analysis was done using Regression equations, percentages and critical ratios.

1. Identification of Over, Normal and Underachievers in the Secondary and Higher Secondary Schools of Kerala

The underachievers in the Secondary and Higher Secondary Schools of Kerala were identified by the Farquhar (1963) technique. The five Regression Equations developed for Standards VIII, IX, X, XI and XII respectively are:

(1) $Y = 0.92X + 26.14$, for Standard VIII

(2) $Y = 0.53X + 50.73$, for Standard IX

(3) Y = 0.99X + 34.88, for Standard X

(4) Y = 0.34X + 36.77, for Standard XI, and

(5) Y = 0.29X + 38.61, for Standard XII

Regression Lines corresponding to each regression equations were developed for identifying the over, normal and underachievers in Standards VIII, IX, X, XI and XII respectively. The proportion of overachievers (OA), normal achievers (NA) and underachievers (UA), identified in the Secondary and Higher Secondary Schools of Kerala as per the above method is presented in Table 1.

TABLE 1
Proportion of Over, Normal and Underachievers in the Secondary and Higher Secondary Schools of Kerala

Achievement Category	School Level		Total
	Secondary	Higher Secondary	
Over Achievers (OA)	139 (13.9 %)	108 (14.8 %)	247 (14.28 %)
Normal Achievers (NA)	692 (69.2 %)	527 (72.19 %)	1219 (70.46 %)
Underachievers (UA)	169 (16.9%)	95 (13.01 %)	264 (15.26 %)
TOTAL	**1000**	**730**	**1730**

From Table 1 it is evident that 15.26 per cent of the students in the Secondary and Higher Secondary Schools of Kerala are *underachievers*, whereas 70.46 per cent of the students under study are normal achievers and 14.28 per cent are overachievers. It is thus evident that *many students in the Secondary and Higher Secondary Schools of Kerala are underachievers in school subjects*, which is an alarming situation. Further, 16.9 per cent of the *Secondary* School students and 13.01 per cent of the *Higher Secondary* School students are *underachievers* in school subjects.

2. Identification of the Incidence of Over, Normal and Underachievement in the Secondary and Higher Secondary Schools of Kerala

The proportion of over, normal and underachievers identified from the Secondary and Higher Secondary Schools of Kerala were compared by applying the one-tailed test of significance for difference between percentages (Garrett, 1981). The data and the results of the comparison are given in Table 2.

TABLE 2
Comparison of the Proportion of Over, Normal and Underachievers in the Age Group 13-17 in the Secondary and Higher Secondary School Levels

Achievement Category	*School Level*				*Critical Ratio*
	Secondary		*Higher Secondary*		
	N_1	P_1	N_2	P_2	
Over Achievers (OA)	1000	13.9	730	14.8	**0.53**
Normal Achievers (NA)	1000	69.2	730	72.19	**1.35**
Underachievers (UA)	1000	16.9	730	13.01	**2.22***

* Significant at 0.05 level

The results, as evident from Table 2 indicate that *there is significant difference in the incidence of underachievement at the Secondary and Higher Secondary level*. Comparison of the percentages shows that *the proportion of underachievers in the Secondary level is higher than that in the Higher Secondary level*. However, the incidence of normal and overachievement do not differ significantly at the Secondary and Higher Secondary levels.

3. Influence of Gender differences on Over, Normal and Underachievement among Students in the Secondary and Higher Secondary Schools of Kerala

The proportion of male and female sub-samples of over, normal and underachieving students in the Secondary and Higher Secondary Schools of Kerala were compared using two-tailed test of significance for difference between percentages (Garrett, 1981), to study the influence of gender differences on the three achievement levels. The results of the tests of significance are summarised in Table 3.

The results revealed that there is significant difference in the proportion of male and female sub-samples of overachievers as well as underachievers. However, no significant difference is noted in the proportion of male and female sub-samples of normal achievers.

Comparisons of the proportion of the male and female sub-samples of under, normal and overachievers revealed that a *higher proportion of the female students are overachievers (18.6 per cent), whereas a higher proportion of male students are underachievers (19.1 per cent).*

TABLE 3
Comparison of the Proportion of Male and Female Sub-samples of OA, NA and UA in the Secondary and Higher Secondary Schools of Kerala

Achievement Category	*Gender Groups*				*Critical Ratio*
	Male		*Female*		
	N_1	P_1	N_2	P_2	
Over Achievers (OA)	837	9.7	893	18.6	**5.24****
Normal Achievers (NA)	837	71.2	893	69.8	**0.64**
Underachievers (UA)	837	19.1	893	11.6	**4.34****

** Significant at 0.01 level

4. Influence of Locale on Over, Normal and Underachievement among Students in the Secondary and Higher Secondary Schools of Kerala

The effect of locale on the three achievement levels, viz. over, normal and underachievement, was studied by comparing the sub-samples of under, normal and overachievers in the Secondary and Higher Secondary Schools of Kerala, by applying the two-tailed test of significance. The results are presented in Table 4.

TABLE 4
Comparison of the Proportion of Rural and Urban Sub-samples of UA, NA and OA in the Secondary and Higher Schools of Kerala

Achievement Category	*Gender Groups*				*Critical Ratio*
	Rural		*Urban*		
	N_1	P_1	N_2	P_2	
Over Achievers (OA)	880	14.6	850	14.0	**0.35**
Normal Achievers (NA)	880	70.3	850	70.6	**0.12**
Underachievers (UA)	880	15.1	850	15.4	**0.17**

The finding shows that there is no significant difference between rural and urban groups with respect to the proportion of over, normal and underachievers, i.e. *the rural and urban groups of students in the Secondary and Higher Secondary Schools of Kerala are homogenous with respect to the incidence of over, normal as well as underachievement.*

Conclusion

The following conclusions were drawn from the findings of the study:

1. Many students in the Secondary and Higher Secondary Schools of Kerala are underachievers in school subjects. 16.9 per cent of the Secondary School students and 13.01 per cent of the Higher Secondary School students are underachievers in school subjects.
2. School level has a significant influence on the incidence of underachievement. The proportion of underachievers in the Secondary level (16.9 per cent) is significantly higher than the proportion of underachievers in the Higher Secondary level (13.01 per cent).
3. Gender has a significant influence on overachievement as well as underachievement. A higher proportion of the female students are overachievers (18.6 per cent), whereas a higher proportion of male students are underachievers (19.1 per cent).
4. Rural-urban locale has no significant influence on the incidence of underachievement in the Secondary and Higher Secondary Schools of Kerala.

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Teaching-learning through EduSat and Academic Performance of Children

A Study

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Abstract

The programme of Sarva Shiksha Abhiyan (SSA) aims at providing access to quality education to all and improving professional competencies of various categories of teachers. Distance Education Programme (DEP) under SSA is a special component to supplement the traditional approach particularly for in-service teacher education programme. Implementation of EduSat through Rajiv Gandhi Project for EduSat Supported Elementary Education (RGPESEE) is a challenge in the light of potimum utilisation of communication technology for improving learning of children at elementary level. The first phase of this project focused on Sidhi district of Madhya Pradesh. The present paper addressed to reflect the effectiveness of implementation of EduSat on improving learning achievement of children in Mathematics at primary grade (standard III and V). At the same time attempt has been taken to campare learning achievement of children (belonging to ROT and non-ROT schoals) in Mathematics. The findings of the study aim at develapment of innovative strategies for effective implementation of EduSat in improving learning of children at elementary level and achieving the target of improving quality of elementary education all over the country.

Introduction

Improving learning of children at elementary level under Education for All (EFA) and Universalisation of Elementary Education(UEE) is a challenge before us. Lack of infrastructure in rural areas and insufficient quality teachers are the main hurdles which adversely affect the efforts made at elementary level. Distance Education

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Programme (DEP) is a special project functioning under MHRD, Government of India for improving quality of elementary education and reaching the umeached with quality input. The Indira Gandhi National Open University (IGNOU) has been entrusted with the responsibility to implement the project all over the country. It aims at providing recurrent training to teachers in a mission mode with the use of Information and Communication Technology (ICT) for professional development of teachers, at one hand, and improves learning of children, on the other hand.

ICT for Classroom Process

ICT is a medium which can promote more and more student-centred and interactive learning. Analysis of the potentials of ICTs suggests that there is a vast scope for application of this technology for accelerating access and equality at the elementary school level and also improving quality of elementary education in our country. Providing adequate inputs to children with optimal utilisation of this technology can bring a revolution in the field of elementary education. It is essential to work out short-term and long-term interventions to improve quality of education including elementary education through the use of ICT. Instructional design of ICT is based on constructivist theory. Children construct their own knowledge and understanding through experience based on interaction.

Education Satellites (EduSat)

The concept of providing educational programmes through satellites was effectively demonstrated for the first time in India in 1975-76 through the Satellite Instructional Television Experiment (SITE) using the American Application Technology Satellite (AATS-6). Programmes pertaining to health, hygiene and family planning were telecasted directly to about 2,400 Indian villages of over six different states. Later, with the commissioning of INSAT system in 1983, a variety of educational programmes are being telecasted. In the 1990s, Jhabva Developmental Communication Project (JDCP) and Training and Developmental Communication Channel (TDCC) further demonstrated the efficacy of tele education.

The Department of Space, Government of India has taken an effort in launching of exclusive education satellite (EduSat) on September 20, 2004, a dedicated satellite for education and development.The services of the satellite are available for 24 hours. The Department of

Space has activated one National Hub to support National Level Networks and activated five Regional Hubs to support regional/state level networks in the country. EduSat was launched to provide quality education at all level.

Rajiv Gandhi Project for EduSat Supported Elementary Education (RGPESEE)

The Indira Gandhi National Open University (IGNOU), in collaboration with Indian Space Research Organisation (ISRO) and Ministry of Human Resource Development (MHRD), Government of India has initiated a pilot project titled *Rajiv Gandhi Project for EduSat supported Elementary Education (RGPESEE)* to utilise EduSat capabilities in strengthening quality elementary education. The main objectives of this project are: (a) ensuring availability of quality online content and access devices in schools; (b) enrich the existing curriculum and pedagogy at different levels by employing all the technologies available through the EduSat including virtual classroom video on demand, etc.; (c) promote a shift from passive learning to active learning; (d) providing in-servIce and research training to school teachers for upgradation of their knowledge and skill; (e) create a suitable environment for the optional use of the EduSat; and (f) provIde training to teachers and master trainers in handling IT supported and ICT enabled education through EduSat.

The project focussed on Sidhi district of Madhya Pradesh which is one of the educationally backward and remotest districts of the state. In addition to Sidhi district, three blocks, one each from one district of Bihar, i.e. Vaishali, Chattisgarh, i.e. Koria; and Uttar Pradesh, i.e. Sonebhadra, were also covered under the project. These are the three adjoining states of Madhya Pradesh. In Sidhi district seven blocks (except Kusmi) and one block from each of the adjoining district of M.P., mentioned above were selected. Receive only Terminals (ROTs) and Satellite Interactive Terminals (SITs) have been installed in selected schools.

Receive Only Terminals (ROT)

Television transmission via satellite are intended for reception by large, high quality, high reliability ground terminals from which signal is distributed to the end users via terrestrial means. Receive only terminals were designed specifically for direct-to-home broadcast receiption Under the pilot project, at each selected school one ROT is

installed to receive the transmission through EduSat from Prantiya Shikshya Mahavidyalaya (PSM), Jabalpur studio. It has one way audio and one way video facility, i.e, from the learning end where ROT is installed teacher and students of that school can see the video(picture) and hear the audio that is transmitted from the teaching end (PSM, Jabalpur). No interaction between the teaching and learning end is possible through this ROT system.

Where Satellite Interactive Terminals (SIT) is installed, interaction is possible between teaching and learning end. But it was not installed in schools. All the selected schools were provided with ROTs only.

List of ROTs and SITs

S.No.	*State*	*District*	*No. of ROTs*	*No. of SITs*
1.	Madhya Pradesh	Sidhi	700	9
2.	Chhattisgarh	Koria	50	I
3.	Uttar Pradesh	Sonebhadra	50	1
4.	Bihar	Vaishali	50	1
	TotaI		**850**	**12**

The project was inaugurated on 07 December 2005. 700 ROTs and 9 SITs were installed in the Sidhi district over seven different blocks. A studio at PSM, Jabalpur was constructed as the teaching end for the project. Transmission (tele-teaching) has been started from 19 December 2005 for primary class children from Monday to Friday and for teachers on every Saturday.

In Sidhi district 700 Receive Only Terminals (ROTs) were installed in selected schools spread over 7 different blocks. In each adjoining states 50 Receive Only Terminals (ROTs) were installed spread over one block. Schools where ROTs are installed, children of those schools only get the benefit of teaching through EduSat

Rationale of the Study

The launching of EduSat on September 20, 2004, at one hand, and transmission through Edusat for elementary education from 19 December 2005 on the other hand, has widened access to quality education but it is yet to bring a revolution in the field of elementary education pertaining to improving professional development of teachers and improving learning achievement of children as well.

One of the objectives of this project is to promote a shift from current passive learning to active learning and help children to construct their own knowledge. In the context of effectiveness of EduSat to improve quality of teaching-learning process at elementary level DEP-SSA conducted a study recently at Sidhi district of Madhya Pradesh to find out the effectiveness of EduSat on learning achievement of children in Mathematics at primary grade.

Research Questions

- Does the teaching and learning through EduSat improve the level of achievement (learning) of children in Mathematics.
- Does the children taught through EduSat (where ROT is installed) able to compete with their counterparts of non-ROT (where no ROT is installed) school with regard to learning of Mathematics.
- Does the learning achievement of children in Mathematics at primary level improve as a result of implementation of EduSat.
- How this intervention of teaching and learning through EduSat be made more effective?

Objectives

- To assess the effectiveness of transmission through EduSat on learning achievement of children in Mathematics in Primary grade.
- To compare the learning achievement of children in Mathematics of standard III and V (Primary grade) of ROT schools with that of their counterparts of non-ROT schools.
- To suggest strategies, for further improvement of teaching learning process through transmission of EduSat for improving learning of children at elementary level.

Methodology

Sample

The Sample of the study constituted 328 children of Standard V (231 students were from ROT schools and 97 were from non-ROT schools) and 334 children of Standard III (230 children were from ROT schools and 104 were from non-ROT schools). The sample was drawn from 7 different blocks of the Sidhi district of Madhya Pradesh.

From each block 3 schools were selected randomly (two schools, where ROT was installed and one school where there was no ROT). All children of Standard III and V of the selected schools were covered in the study.

Tools

The competency-based achievement tests on Mathematics for Standard III and V were developed separately for the present study keeping in view the content taught through transmission of EduSat supported network and used in the present study to assess the achievement level of children pertaining to the study.

Statistical Techniques

Descriptive statistics like Mean, Mean per cent and Critical Ratio were used for analysis and interpretation of data

Procedure

A newly developed competency-based achievement test for Standard III and V in Mathematics were administered on sample children of Standard III and V respectively. The same test was administered in schools where ROT was installed and the schools where ROT was not installed as well. For each Standard overall Mean, Mean per cent were computed separately for children of ROT school and non-ROT school. A comparison was made between the Mean per cent of children of ROT schools and non-ROT schools by using the descriptive statistics Critical Ratio (CR). Similarly, comparison was made on the basis of gender and caste separately. Attempt was also taken to develop a category-wise (General, SC, ST and OBC) comparative profile of children belonging to two different schools (ROT schools and non-ROT schools) on the level of achievement in Mathematics.

Analysis and Interpretation

The present study assessed the effectiveness of transmission through EduSat on learning achievement (Performance) of children in Mathematics at primary grade. Scores are presented separately with regard to different category of children.

Table 1 presents results in respect of the level of achievement in Mathematics of children studying in Class V of ROT and non-ROT schools. The results indicate that the mean achievement percentage

TABLE 1
Learning Achievement in Mathematics in Standard V Children

Sl. No.	*Category*	*Gender*	*ROT Schools*		*non- ROT Schools*		*Diff. in Mean %*	*C.R. value*
			Mean	*Mean %*	*Mean*	*Mean %*		
1.	Gen	Boys	11.79 N=30	47.19	12,86 N=15	51.44	4.25	0.27
		Girls	13.74 N=28	54.96	8.14 N=14	32.56	22.4	1.61
		Boys & Girls	12.76 N=58	51.06	10.5 N=29	42.0	9.06	0.01
2.	SC	Boys	10.41 N=20	41.64	12.28 N=18	49.12	7.48	0.46
		Girls	10.21 N=15	40.82	10.96 N=9	43.84	3.02	0.15
		Boys & Girls	10.31 N=35	41.24	11.62 N=27	46.48	5.24	0.41
3.	ST	Boys	17.42 N=13	49.67	8.83 N=10	35.3	14.37	0.69
		Girls	13.5 N=12	54.0	12.25 N=4	49.0	5.0	0.17
		Boys & Girls	12.96 N=25	51.84	10.54 N=14	42.16	9.68	0.58

4.	OBC	Boys	11.82 N=73	47.29	9.82 N=16	39.27	8.02		0.59
		Girls	12.35 N=40	49.39	9.1 N=17	36.73	12.66		0.87
		Boys & Girls	12.09 N=113	48.34	9.51 N=33	38.04	10.3		1.04
5.	All (Gen+8C+ 8T +OBC)	Boys	11.61 N=136	46.44	10.95 N=53	43.79	2.65		0.44
		Girls	12.45 N=95	49.0	10.11 N=44	40.45	8.55		0.93
		Boys & Girls	12.03 N=231	48.12	10.53 N=97	42.12	6.0		1.01

of children in Mathematics belonging to ROT schools of Sidhi district are higher than that of their counterparts belonging to non-ROT schools. Though the differences are not significant, but are in favour of children studying in ROT schools. Similar is the situation with regard to other sub groups.

From these results, it may be inferred that in none of the groups and sub-groups the difference in achievement levels was found to be significant. Though the implementation of EduSat has brought some changes in the perception of teachers in the Sidhi district of Madhya Pradesh, but a lot yet is to be done to improve the effectiveness of this technology, so as to get desired results in improving the achievement level of children in Mathematics and improving professional competencies of teachers as well.

A perusal of Table 2 indicates that the mean percentage of children belonging to ROT and non-ROT schools of Sidhi district in Mathematic goes in favour of children belonging to ROT schools in certain groups like General Boys, general Girls, SC Boys, ST Girls and OBC Girls; whereas in all other cases like SC Girls, ST Boys and OBC Boys, it is in favour of children belonging to non-ROT schools. This shows that target of EduSat has been achieved to certain extent though teaching through this technology is yet to compete successfully for all sub-groups. It is also indicated from the Table 2 that no difference is found to be statistically significant under the groups and sub-groups. It is a challenge to the efficacy of teaching and learning through Edusat.

On comparison of all groups of children irrespective of groups and sub-groups, it is found that mean percentage of children belonging to ROT school (37.48 per cent) is slightly more than that of children belonging to non-ROT schools (36.72 per cent). Similar is the situation with regard to achievement of boys (41. 5 3 per nent for ROT schools and 41.90 per cent for non-ROT schools). Whereas the achievement (Mean per cent) of girls belonging to ROT school (37.32 per cent) is higher than girls belonging to non-ROT schools (31.56 per cent)

Findings Pertaining to Comparison of Learning Achievement in Mathematics of Standrad V

The mean per cent of children in Mathematics under ROT schools of Sidhi district is found to be higher than that of their counterparts of non- ROT schools (48.12 per cent for ROT schools and 42.12 per cent for non-ROT schools). This also holds good in case of boys (46.44 per

TABLE 1
Learning Achievement in Mathematics in Standard III Children

Sl. No.	*Category*	*Gender*	*ROT Schools*		*non- ROT Schools*		*Diff. in Mean %*	*C.R. value*
			Mean	*Mean %*	*Mean*	*Mean %*		
1.	Gen	Boys	12.17 N=27	48.66	10.15 N=10	40.59	8.07	0.44
		Girls	10.36 N=40	41.42	7.09 N=18	28.35	13.07	0.95
		Boys & Girls	11.26 N=67	45.06	8.62 N=28	34.48	10.58	0.95
2.	SC	Boys	10.93 N=20	43.71	11.0 N=14	44.0	0.29	0.02
		Girls	8.58 N=28	34.31	11.5 N=7	46.0	11.69	0.57
		Boys & Girls	9.76 N=48	39.02	11.25 N=21	45.0	5.98	0.
3.	ST	Boys	8.76 N=17	35.07	10.86 N=9	43.47	8.4	0.42
		Girls	8.25 N=14	32.99	7.36 N=17	29.44	3.55	0.18
		Boys & Girls	8.51 N=31	34.02	9.11 N=26	36.44	2.42	0.19

4.		Boys	10.3 N=48	41.2	9.95 N=13	39.81	1.39	0.09
	OBC	Girls	9.89 N=36	39.53	7.00 N=16	2.80	36.73	0.80
		Boys & Girls	10.09 N=84	40.38	8.48 N=29	33.9	6.48	0.62
5.	All (Gen + SC + ST + OBC)	Boys	10.54 N=112	42.16	10.49 N=46	41.96	0.2	0.02
		Girls	9.27 N=118	37.08	8.24 N=58	32.95	4.13	0.54
		Boys & Girls	9.01 N=230	39.62	9.36 N=104	37.46	2.16	0.38

cent for ROT schools and 43.79 per cent for non-ROT schools) and girls (49.00 per cent for ROT schools and 44.45 per cent for Non-ROT schools) as well. Performance of girls under ROT school is better than that of their boy's counterparts in one hand and counterparts of non-ROT schools on the other hands.

In all sub groups like General, ST and OBC the average achievement of children of ROT schools are on the higher side in comparison to children of non-ROT schools except in case of the children of SC category. On the basis of the comparison of performance of boys it is found that under general and SC category the mean percentage of achievement is tilted towards children of non-ROT schools where as in case of ST and OBC it is exactly reversed. It is worthy to note that performance of Girls in ROT schools under all categories are on the higher side than that of their counterparts of non-ROT schools.. Though the differences are not statistically significant, these are in favour of children of ROT schools. This clearly reflects the effectiveness in the implementation of technology in improving learning of children. That is effectiveness of Edusat is steadily increasing pertaining to improvement in learning achievement of children in Mathematics.

Findings Pertaining to Comparison of Learning Achievement in Mathematics of Standard III

Children of ROT schools in Standard III perform better over non-ROT schools (39.62 Mean per cent for ROT schools and 37.46 for non ROT schools). Similar is the situation with regard to average achievement of boys (42.16 Mean per cent for ROT schools and 41.96 per cent for Non ROT schools) and girls (37.08 Mean per cent for ROT schools and 32.95 for non-ROT schools) as well. In both ROT and non-ROT schools average achievement of boy is more than that of their girl's counterparts.

Mean per cent of children of general (45.06 Mean per cent for ROT schools and 34.48 for non-ROT schools) and OBC (40.38 Mean per cent for ROT schools and 33.90 for non-ROT schools) category belonging to ROT schools are on the higher side over the children of Non ROT schools but in case of SC (39.02 Mean per cent for ROT schools and 45.00 for non-ROT schools)and ST (34.02 Mean per cent for ROT schools and 36.44 for non-ROT schools) children the difference goes in favour of children of non-ROT schools. There is no significant difference between the mean per cent of children of Standard III belonging to ROT and non-ROT schools of Sidhi district but in many

cases it goes in favour of children of ROT schools like Gen. boys (49.79 per cent), Gen girls (38.20 per cent), Gen. boys and girls together (44.00 per cent), SC boys (39.70 per cent), ST girls (35.07 per cent), ST boys and girls (37.14 per cent) and OBC girls (38.19 per cent), etc. Children found to be benefited gradually to a great extent in developing their Mathematical skill and ability through the innovative teaching-learning process by the implementation of technology (EduSat).

Findings pertaining to the Discussion with the Field Level Functionaries like Teachers and BRCCs/CRCCs

The following important comments and suggestions are made by the functionaries working at the field in various blocks of Sidhi district of Madhya Pradesh:

- During teaching through EduSat more teaching-learning materials, models, illustrations, etc. may be used to make the process interactive and effective.
- Interactive CDs may also be used to develop the curiosity and interest of children at primary level.
- More emphasis should be laid on fundamental concepts and basics with innovative instructional strategies rather than routine teaching-learning process.
- Some clippings, SSA songs, weekly programme schedule, etc. may be transmitted as fillers in between two programmes.
- Tele teachers should use regional /locallanguage during teaching through EduSat for the benefit of children of standards I, II and III in particular.
- Content matter should be presented on the screen for a longer time so that children can read and note the points as required.
- Teachers should remain present during the transmission and act as a moderator/facilitator in explaining and clarifying the key aspects to children.
- It is important on the part of teacher to note the difficulties faced by them and children and discuss the same after the transmission.
- Programmes like yoga, value education administrative aspects and entertainment, etc. should be transmitted in Saturday for teachers as well as children.

- On Sunday or in other public holidays programmes related to roles and responsibilities of parent teacher association and mother teacher association and community related topics may be transmitted for the benefit of community.

Educational Implications

Findings of the present study have bearing on following implications for improving strategies of Implimentation of transmission through EduSat in general and to meet the needs of learning group in particular. Specific observation based on the findings of present study requires strategic planning improve learning of children through effective Implimentation of EduSat.

Training/orientation of teachers at cluster level particularly on academic aspects like classroom transaction, school effectiveness programmes, potentials of technology, pedagogy of the Implimentation of technology and changing roles of teachers to facilitate learning of children during transmission through EduSat, etc., will definitely help to make the transmission through EduSat beneficial for clilldren and improving professional competencies of teachers. This helps in utilising their services effectively in classroom for optimum benefit of EduSat transmission particularly for improving learning of children.

Information indicating details of the topic to be transmitted, class for which it is meant should be prepared for the whole session and sent to the learning end from the beginning of the academic session. Additional support material on each topic may be prepared and supplied to concerned teachers in advance. Participation of concerned subject teacher, immediately after the transmission for effective interaction/discussion with the children constitutes the major part of teaching and learning through technology. Teachers working at elementary level are encouraged to initiate pre and post transmission discussion with children to ensure their interest and motivate them towards learning through EduSat. Their role is more important as a facilitator rather than a transmitter of knowledge.

Trained and competent teachers, teacher educators from DIETs be invited and engaged during the development of content for transmission along with other resource persons. Suggestions of working teachers be invited and duly acknowledged by incorporating it in the development of tele-content. Resource persons who can easily communicate with local dialect be selected and invited for teaching from the studio (Tele-teacher). Mathematical terms used by tele-teachers should be clear to make it understandable for the target

group. Tele-teachers may be asked to use more and more examples, illustrations and activity to develop the curiosity of children and make them actively engaged in teaching-learning process.

Monitoring mechanism must be made effective at all level to ensure smooth functioning of teaching-learning processes. One ROT at each BRC and CRC and one SITE at each DIET may be provided in a district through which monitoring strategy can be strengthen and made effective. Teacher educators (DIET faculties) should be engaged in monitoring activities and accountability be fixed on DIET functionaries to make the monitoring more effective. Local community be involved in supervision and monitoring programme for developing a sprit of ownness and ownership towards school and school programmes. It facilitate learning of children and at the same time ensure enrolment of children and reduction of dropout as well.

Strategy related to transmission of content for each class be made systematic and regular. Instead of covering all subjects from Class II to VIII steps may be taken to cover one subject for each class, as a result of which children can get a concrete idea on a particular subject, delivered through EduSat. Time of transmission may be distributed class-wise so that in a day transmission may be made for more than one class.

Facilities like a separate room, seating arrangement, learning materials, etc need to be improved at every learning end to maintain academic atmosphere. Functionaries working at cluster block and district levels need recurrent training to get them mobilised and motivated for improving their competencies. A nodal officer may be appointed at each Block, who will be accountable for making necessary arrangement and maintenance of ROTs and T.V. sets including other technical aspects and ensure their effective functioning regularly.

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Developing Environment Friendly Behaviour among Adolescents

Role of Intervention

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ABSTRACT

The influence of environmental destruction on modern life has been a globally critical problem.Industrialised countries degrade the environment by insatiable consumption of resources and intense production of waste. Population Growth in many developing countries puts damaging pressure on the planet. Therefore, if we want to manage our earth we must make people environmentally educated to develop environment friendly behaviour. Environment friendly behaviour is any action of individual or group directed toward the remediation of environment problems. Present study attempts to assess the impact of intervention on environment friendly behavir amongs adolescents. The data were collected from a sample of 150 IX and X grade adolescents by using environmental responsibility assessment inventory and consciousness about pollution scale, developed by Dr.Sandhya Gihar, Kukreti & Shah. Thirty students were selected as sub sample for *intervention.. The study has revealed that there is significant impact of intervention on adolescents' consciousness about environment pollution and environment friendly behaviour. The study has not found gender difference on environment friendly behaviour and consciousness about pollution among boys and girls.*

Environment is not merely the atmosphere and other physical factors surrounding us, but is the complex of all factors which not only affect one organism at a time, but all organisms all the time. The destruction

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of environment in modern time has been a globally critical problem since the beginning of the late 1960s due to increasing high industrialization and extra resource utilisation. The current environmental crisis is really a crisis of maladaptive behaviour and not a technological problem. Human societies have faced crisis of existence and by and large have emerged with acquired wisdom and knowledge. The present situation of the environment crisis all over the world has brought us to the same point and we are hopeful that with the wisdom and knowledge acquired, we will definitely overcome the impending disaster. Resolution of current ecological dilemma will necessitate not only technological changes and improved scientific knowledg, but also changes in people's behaviour. These changes could be brought about only through a continuous lifelong inter-disciplinary enviromnental education.

Environmental education has assumed great importance in recent years since the life on this planet depends, to a large measure, on our response to emerging problems related to the environment. Environmental education tends to make citizens aware and conscious about the hazardous impact of environmental degradation, pollution and to generate knowledge, awareness and consciousness among them about different environmental components. It is also realised that the existing enviromnental education programme have to be revised and new ones developed that are more holistic and learner centred.

Environmental problems cannot be solved within a day or two. It requires rigorous efforts at school level. The present investigation examined the effect of intervention on environment friendly behaviour and consciousness about pollution among adolescents. In order to make them realise their own responsibility toward environment, it was assumed that intervention would prove to be a powerful tool by making, them aware and conscious about the hazardous impact of environmental degradation. This is a crucial time to realise that environmental sensitivity and environment friendly behaviour should be cultivated among masses particularly among adolescents. Environment Friendly Behaviour is any action of an individual or a group directed towards the remediation of environmental issues/ problems. Several studies have been conducted in India and abroad to show the siginificance of environmental education/intervention in various form. Video interventions for environmental behaviour of the students make them feel their own responsibility towards environment. The use of video intervention has proved a powerful

tool that can make citizen aware and conscious about the hazardous impact of environmental degradation. (Kukreti and Gihar, 2006). Dissemination of environmental education for sustainable development of the community should be a lifelong process and should not only be restricted to a learner's tears in higher education. Informal environmental sustainability education, including personal involvement in NGO environmental action can be an effective way of increasing the understanding of environment and sustainability issues. (Martin, 2006).

Existing environmental education programmes only generate awareness and sensitivity but do not focus on the skills and attitude levels. School children do not get opportunities to develop skills to analyse and evaluate local, regional, or national environmental problem or issues (Faisal, 2006). Environment education movement has gained momentum all over the world. To make this movement an observable reality in India, universities, colleges, schools should come forward and give environmental, education its proper place in teaching, research as well as extention activities in various courses of study. It is only self motivation and sense of duty in teachers themselves which can bring a grassroots skill and behaviour of masses (Srivastava, 2006). Unfortunately, the much-needed bonding between people and nature can not be taught or learned through a textbook within the four walls of a classroom. Human being must be taught the art of living environmentally sustainable lives right from early childhood. (Pardiwal,2005). Outdoor education programme that provide opportunities for student to become environment consicous citizens prepared Student to recognise their environmental responsibilities and act upon them. (Yerkes 2000).

Field trips and outdoor studies are very much educative as they develop curiosity in students. Films and video cassettes on tiger projects and different type of birds may be shown to the students to develop in them an interest for the environmental conservation (Patankar, 2000). Key to solving the environmental crisis lies with the individual who have to make environmental protection a part of their behavioural repertoire. Evironmental protection can only be brought about through the conceptual realignment between our desire for wasteful exploitation of resources and their judicious utilisation for sustainable development (Mishra and Mishra, 1993). AIl these studies give an impetus to present investigation to get a preliminary idea of motivating the students through intervention so that they become more conscious about environment pollution and degradation and develop environment friendly behaviour.

Objectives of the Study

- To find out the impact of intervention on environment friendly behaviour among adolescents.
- To find out impact of intervention on level of awareness about pollution among adolescents.

Methodology

Selection of Locale and Sample

Present study was conducted on 150 students studying in Classes IX and X (14-16 years) in Tonk, Rajasthan. Thirty students (15 girls and 15 boys) who scored lowest on Environment Responsibility Assessment Inventory (ERAI) were further selected as sub samples for intervention.

Selection of Method

The study is based on pre- and post-test without control experimental design. In such a design, effect of treatment are judged by the difference between the pre-test and the post-test scores.

Selection of Tools

(i) *Environment Responsibility Assessment Inventory* (ERAI). The inventory was developed and standardised by Gihar, Kukreti and Shah (2002). ERAI has 71 items spread over seven dimensions related to environmental responsibility. It has multiple choice type items. Each item has three options. In this inventory one mark has been awarded to the correct response where as 0 to the incorrect response.

Dimensions of ERAI

- Using environment friendly products
- Participation in activities to save the environment
- Economic use of natural resource
- Prevention of pollution
- Awareness about environmental issues
- Protecting green trees and vegetation
- Ecological concern

(ii) *Consciousness about pollution scale* developed by Gihar and modified by the investigator. Orginal tool contains two parts, A and B. B Part consists of difficult items which need lots of preparation regarding theoretical knowledge and practice in order to attempt them. Orginal tool is difficult to understand without theoritical knowledge and practice. It can be administered to XI-XII grade adolescents and other adults because they have presumably greater information regarding environment. The modified version consists of 34 items in A section which has multiple choices and 63 items in B section in which responses are obtained in the form of true and false. Each correct response is awarded a score of 1 (one) and incorrect response a score of 0(zero). Some of the items were taken as such from the original tool, whereas some were modified in terms of language and making compact and comprehensive. The tool has high academic value as the items are of high standard.

Procedure

Phase I Pre-testing and Screening

- Assessment of the level of environment friendly behaviour
- Assessment of the level of consciousness about pollution.
- On the basis of the assessment 30 sub samples who scored less were selected for intervention programme.

Phase II Intervention

- Intervention programme was organised and conducted for 30 sub samples (girls and boys)for ten days. Different activities were planned for intervention. Guest lectures, group discussions, role play, slide show, competitions (chart, poster, models and slogan), games and exhibition constituted important activities of the intervention programme.

Phase III Post-testing Assessment of the Impact of the Intervention

- Pre- and post-test scores of the sample were used to assess the impact of intervention programme. The same questionnaire was administered to the participants after the intervention programme for post-testing.

TABLE 1
Pre-intervention and Post-intervention Mean, SD Scores and 't' valne of IX and X Class Students on different Dimension of Environmental Responsibility Assessment Inventory

S. No.	*Dimensions of ERAI*	*Pre-testing N=30*		*Post-testing N=30*		*'t' value*
		Mean	*SD*	*Mean*	*SD*	
1.	Using environment friendly products	5.465	.67	6.36	.69	5.05**
2.	Participation in activities to save the environment	5.23	.69	6.16	.76	5.11**
3.	Economic use of natural resources	5.465	.89	6.67	.88	5.21**
4.	Prevention of pollution	5.3	.77	6.1	.86	4.01**
5.	Becoming aware of environmental issues	5.15	.815	5.8	.77	3.25**
6.	Protecting green trees and vegetation	5.7	.77	6.65	.81	4.75**
7.	Ecological concern	5.26	.73	6	61	4.27**
8.	Overall environmental responsibility	37.9	3.16	43.24	5.39	4.68**

** P <.01

Table I indicates that sense of responsibility 'towards' environment among thirty students was significantly affected by the intervention. In comparison to pre-intervention test scores, students scored higher on responsibility towards using environment friendly products, participation in activities to save the environment, economic use of natural resources, prevention of pollution, becoming aware of environmental issues, protecting green trees and vegetation, ecological concern as well as on overall environmental responsibility on post intervention test. All the 't' values are significant at .01 level of significance. Hence, the results indicated that intervention programme had significant impact on environment friendly behaviour of students

Impact of Intervention Programme on Girls

TABLE 2
Pre-intervention and Post-intervention Mean and SD Scores of IX and X Class Girls on different Dimension of ERAI

S. No.	*Dimensions*	*Pre-test N=15*		*Post-test N=15*		*'t' value df 13*
1.	Using environment friendly products	5.03	.49	6.01	.61	4.9**
2.	Participation in activities to save the environment	5.4	.61	6.13	.61	3.3 **
3.	Economic use of natural resources	5.33	.86	6.33	.78	3.44 * *
4.	Prevention of pollution	5.2	.83	6.2	.73	2.85*
5.	Becoming aware of environmental issues	5.3	.86	5.9	.77	2.26 *
6.	Protection of green trees and vegetation	5.6	.71	6.6	.69	5.88**
7.	Ecological concern	5.33	.78	6	.51	2.79*
8.	Overal1 environmental responsibility	38	2.50	44.16	2.78	6.28**

** P<.01
* P<.05

Table 2 shows that the intervention influences significantly the responsibility towards environment among girl students. It is clear from the table that in comparison to pre-intervention test, the girl students scored higher after intervention. Further, the table indicates that mean values of post-intervention test on the dimensions, i.e. responsibility toward using environment friendly products, participation in activities to save the environment, economic use of natural resources, prevention of pollution. The dimensions such as being aware of environmental issues, protecting trees and vegetation, showing ecological concern and overall environmental responsibility showed significant impact of intervention.

Impact of Intervention Programme on Boys

TABLE 3
Pre-intervention and Post-intervention Mean SD Scores and 't' value of IX and X Class Boys on different Dimension of ERAI

S. No.	*Dimensions*	*Pre-test N=15*		*Post-test N=15*		*'t' value df 13*
1.	Using environment friendly products	5.9	.85	6.7	.77	2.75*
2.	Participation in activities to save the environment	5.06	.77	6.2	.90	3.8**
3.	Economic use of natural resources	5.6	.92	7	1.0	4.0**
4.	Prevention of pollution	5.4	.71	6.0	.99	1.93 NS
5.	Be aware of environmental issue	5.0	.77	5.7	.77	2.5*
6.	To save green trees and vegetation	5.8	.83	6.6	.94	2.5*
7.	Ecological concern	5.2	.67	5.5	.71	1.2
8.	Overall environmental responsibility	37.8	3.82	44.5	6.9	3.30**

** P<.01
* P<.01

Table 3 indicates that the sense of responsibility towards environment among boys student was also significantly affected by the intervention. In comparison to pre-intervention test scores boys had higher mean scores on responsibility towards using environment friendly products, participation in activities to save the enviroliment, economic use of natural resources, prevention of pollution, being aware of environmental issues, protecting trees and vegetation, ecological concern as well as on overall environmental responsibility. If we compare the pre-test and post-test scores of girls and boys there is no significant difference in environment friendly behaviour.

Assessment of the Impact of Intervention on the Level of Consciousness about Pollution among Adolescents

In comparison to pre-intervention test score ($\bar{x}$ = 36.26) adolescents had significantly higher mean scores (42.61) in the post-intervention test ($t(29)=8.6$, $P < .01$). Also, the level of consciousness among girls (pre-test mean = 36.13); post-test mean = 43.11, $t(14) = 6.75$, $P <.01$) was significantly affected by the intervention. Similar results were obtained for boys (pre-test = 36.4, post-test = 42.1, $t(14) = 5.41$, $P <.01$). There was no significant differences in consciousness about environment between boys and girls.

ERAI can be applied on adults also as items of the tool are related to general habits, behaviour and knowledge. CAPS consists of some scientific items. In order to answering these questions person should have knowledge regarding environmental science. These tools can be applied on literate adults. Since these tools have high academic value, expected outcome of intervention would exhibit better environmental values, conciousness and environmental responsibility among adults since they are more matured as per age and behaviour.

Conclusion

To conclude, we suggest that through intervention, the main agencies of education, particularly schools and family can motivate the students to realise the nature of environmental problems and ensure their participation in preservation and protection of environment. For sustaining environment, it is the time to generate environment friendly behaviour and to motivate adolescents to establish a congenial and harmonious coexistence with nature. Intervention has proved very effective medium for this purpose.

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ERIC Projects Completed

Availability and Use of Information and Communication Schools In Delhi

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Introduction: The present study intended to study the availability and use of information and communication technology (ICT) in schools in Delhi. Since the government and private initiatives are increasing and attempts are made towards integration of technology in school education, a study about the availability and use of computers covering the teachers as well as students was taken up.

Objectives of the Study: The present study contained following objectives: (1) to study the extant of availability of hardware and software facilities in schools in Delhi, (2) to study the extent of use of technologies in different types of schools as evident from competencies in students, (3) to study the impact ICT on students, and (4) to study the extent of training in computers received by the teachers of Delhi.

Procedure: The present study was exploratory in nature and the data were collected from the teachers and students from schools of Delhi.

Sample: In this exploratory study, a total of 309 schools belonging to different categories, 822 primary school students, 970 secondary school students and 196 teachers selected randomly from the schools of Delhi, participated.

Research Tools: As this study was exploratory in nature, four questionnaires were developed and used.

Data Analysis: The data were categorised and analysed quantitatively. Frequencies and percentages were computed.

Findings: Results indicated some interesting trends. The availability of e-mail ID among the schools seemed to be low. 94% of the total

schools in Delhi have computers. 92.41% of the schools reported that the computers were in good condition. Computer labs have been set up in 84% of the schools studied. Printers are available in 84.14% of the schools. Internet facility was available in 71.52% of schools covered in this study. Local Area Networking (LAN) was available in 61.49% of schools.

The availability of Laptop was reported by 7.12% of the total schools studied. The availability of data lodger was there in 1.94% of total schools and 13% of schools had an LCD projector. Each of the CAL classrooms set up by Delhi Government was equipped with one computer, one 29" television monitor, a computer cabinet and a set of colourful chairs. TIlough the availability of scanners, internet filtering facility and Interactive white bored were not very good, the infrastructure needed to integrated ICT into curriculum especially the hardware was available.

Availability of software was not very good as publishing software was available in 23.33% of schools and 9.71% of schools had software for web design. General knowledge CD's were available only in 16.5% of the schools. Encorta and other Encyclopaedia CD's were available in 10.68% of schools, 5.5% of schools have access to online libraries. CD's for teaching different subjects were available in 19.42% schools. The availability of software in schools for games and music was 21.64% schools and 7.44% respectively. The percentage of schools with availability of teacher mode software and CD's for the disabled in schools was 6.45% and 22.58% respectively.

Separate periods for computers were allocated at nursery level by only public schools. At the primary school level 61.48% and at higher secondary level, 43.68% school had separate periods for computers. In schools where the CAL toonz project was implemented one period per day per section was to be allocated for computer classes (Teaching in computer lab). hl the Mahiti sindhu programme in Karnataka each class gets four periods per weeks. In the IT @ school project four periods per weeks (2 for theory and 2 for practical) are allocated. In Delhi, allocation for periods per week for computers needs to improve.

The findings regarding uses of ICT/computer in schools in Delhi were also interesting. 84% schools used computers in admission process. 46.93% schools used computers for maintaining records. 18.77% of the schools covered in this study used it for maintaining records in the library. 12.06% of total schools covered in this study used computers for examination purpose. 81% of the schools covered in this study had computer education as a teaching subject.

In this study the findings regarding the impact of ICT on students reveal some interesting trend. Students with different levels of ICT competing were compared with their achievement and it was found that those who scored low in ICT competency had low achievement also, with a few exception. Time spent on studies is higher in the case of students who were having average and high ICT scores when compared with those who had low scores in ICT competency. On an average majority of students belonging to all groups spent only 2-3 hours per day for studying. The low average and high ICT groups did not differ in the interests in the case of computer, but the low ICT competency group was interested in studying/reading where as average competency group was interested in games.

After analysis of data, the findings regarding training of teachers in Delhi to use computers show following trends. 35.20% of teachers have had no training in computers. 53% teachers had no computers. 53% teachers had no training in computers at home. 55% teachers did not spend any time with computers. 83% of the teachers who took part in this study felt confident that if they get computers they will surely use computers for their classroom training.

Conclusion: The findings of this study, show that if the schools in Delhi are to tap the potentials of ICT to its fullest extent there needs to be more in-service training of teachers regarding the use of ICT, there should be more software for teaching purposes and there should be more periods have periods allocated for computers at all levels.

Decentralisation of Education in Karnataka

Project Investigators

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Introduction: With the phenomenal expansion of the formal educational system there has been a considerable progress in universalisation of elementary education. However, a large number of children have still remained outside the school. Further, a large segment of children from marginalised groups continue to be deprived of primary education. It is in this context that the present study was taken up to address the problems in the spread and strengthening of elementary education and the ability of Panchayats to resolve them without creating new ones.

Objectives of the Study: The present study was conducted with the following objectives: (a) To understand role of Panchayati Raj bodies in primary education in villages, (b) to study and assess devolution of power to Gram Panchayats and Taluk Panchayat in the area of primary and secondary education, (c) to understand and assess the gap, if any, between the objectives of national and state educational policies and the perception of Panchayati Raj Functionaries in the context of Education For AII (EFA), (d) mapping of network of village level agencies and NGOs in the functioning of educational institutions, (e) assessment of the impact of schemes introduced by the state government to prevent dropouts and to increase the enrolment of students and the extent of involvement of panchayat raj bodies in these schemes, (f) to understand the conflict of interests, if any, between elected members of PRIs and the local level educational functionaries and the nature of such conflicts, and (g) to study the impact of decentralisation in the context of education on the disadvantaged groups.

Procedure: The study adopted case study approach and data were collected from heads of schools, teachers, gram panchayat secretaries, gram panchayat members, anganwadi teachers, community members and school records of the twenty sampling schools of the two districts of Karnataka.

Sample: The Present study includes two districts – Chitradurga and Devanagere of Karnataka State. Sample consisted of 40 teachers, 83 SDMC members. 16 Gram Panchayat members,12 Anganwadi teachers, 20 Headmasters, 7 Gram panchayat secretaries, 12 community members. They were selected from 20 gram Panchayats of two districts of Karnataka.

Research Tools: As this study was descriptive in nature so the tools used for the study were also qualitative in nature. Non-participative observation and unstructured interview schedule were used for the collection of data.

Data Analysis: The data were analysed both qualitatively and quantitatively. The technique of content analysis was applied to analyse the qualitative data which was then used to formulate a theory.

Findings: On the basis of analysis of data regarding functioning of State Development Monitoring Committee (SDMCs) some of the broad findings drawn are: (a) 100% (20 schools) of the villages reported that they have anganwadi facilities. It was observed that pre-school

facilities in the village have to work in conjunction with the primary schools; (b) 70% (14 schools) of the villages have community organisations like SHGs, Dalit Sanghas, Farmers organizations etc. There is scope for the involvement of SHGs, like *Stree Shakti*, run by women members, in school activities at various level; (c) During the field study it was also observed that the youth clubs have shown keen interest in the development of the schooL Mobilisation of local youth for school activities can add value as an advocacy tool; (d) 10% (02 schools) of the villages reported that education related issues are discussed at the *Gram Sabha*.

Conclusion: The present study reveals that we are gradually approaching towards the very purpose of decentralisation of education despite of many obstacles .But there is a need of collaborative efforts that has to made by central agencies, state agencies and local agencies for the goal of decentralisation of education.

Promoting Entrepreneurship Spirit at the Upper Primary School

An Experimental Study

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Introduction: The present study is an exploration of our understanding of entrepreneurial construct among elementary stage students (age groups 11-14 years) and carves out the ways to create and strengthen the entrepreneurial culture within the school setting. The study aims to profile entrepreneurship as an educational objective and help children grasp the concept while fostering their enterprise/ entrepreneurial skills along the way.

Objectives of the Study: This study main objectives of the study were: (a) To explore the understanding of entrepreneurial activities among children in the age group of 11-14 years; (b) to develop a module on entrepreneurship (intervention package) on selected themes based on real life sketches of first generation entrepreneurs; educational activities and skills necessary for entrepreneurship; (c) to identify the measures to asses the entrepreneurial spirit at upper primary stage; and (d) to develop the educational measures for the promotion of entrepreneurship education at school level.

Procedure: The present study was explorative in nature. It was conducted in two phases – construction of a module (intervention package) and organisation of *The Educational Camp*.

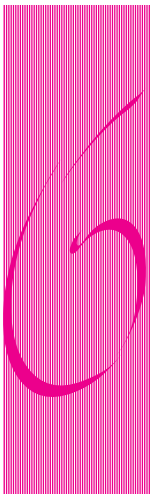
Sample: The study comprised of 40 children with almost 50% girls to study gender differences on career aspiration. The group was heterogeneously constituted from Classes V, VII, and VIII. The children belonged to both business and service classes. The children were selected randomly.

Research Tool: The methodology of action research was applied to study the impact of entrepreneurial instances and assess the understanding level of children. Throughout the course 'Problem based learning' (PBL) was viewed as an effective approach in developing enterprising behaviour among them.

Data Analysis: The data were analysed both qualitatively and quantitatively. The complete module was divided into eight sections. The responses were also collected section wise and were compiled on a data sheet. Simple percentages were used for computation.

Findings: The findings revealed some interesting features. The Entrepreneurial values can be developed as life skills rather than only seen as an economic activity. The inspirational nature of the curriculum motivates the child to grow with an enterprising spirit, develop life skills to face challenges of life rather than pushing the child to it. The study showed that the cross disciplinary themes, cutting across the curriculum, can be brought down to the elementary stage in an understandable and comprehensive manner.

This study helped in exploring and institutionalising the pedagogic role of entrepreneurship in education and aims at qualitative change in educational experiences. The study shows that entrepreneurship, in an educational context, is a way of thinking that learning about an idea is not the same as living out with that idea.



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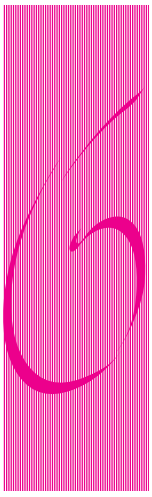

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