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RESTRUCTURING STUDY METHODS AND APTITUDE TRAINING IN SCIENCE TEACHING: AN URBENT NEED

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ABSTRACT

Science is being taught in our country from very early days. In the beginning of twentieth century science was not a school subject .The report of the secondary school commission 1953, recommended the teaching of general science as a compulsory subject in the high and higher secondary school. The world is changing every second. The needs are changing. So the objectives of science education are needed to be modified according to the need of time. Real science should clearly communicate and describe the intended learning outcome. The teaching –learning in science should bring to the notice of the child, the link and between daily life and science .Science should be presented to the students as a way in which they can conduct an inquiry into the nature of things as a well as a body of information built up by other people. Science teaching is to be made participatory, joyful and relevant for all types of student's Coordination in theory and practical is needed. Now we entered twenty –first century," Science education" depends upon restructured issues of science teaching.

Keywords: Science Education, Teaching, Learning, Theory, Practical.

INTRODUCTION

We live in the age of science. Science has brought tremendous changes in the life of man. As a subject in School curriculum, what should we teach in science? Why should we teach? What we teach in science? How should we find out that students have understood what we taught them? These are some important points to be consider by those who are concerned with science education

NEED OF SCIENCE EDUCATION

The 20th century has witnessed revolutionary changes which were unprecedented in the recorded history of the world civilizations. With the changing time, a new brand of knowledge known as Science emerged .Sciences unfold picture of the universe and allow man to extend his knowledge to exercise control over his surroundings, whether it is concerned with the care of his family or of the society. These developments are meaningful only when the ordinary people can appreciate them and can help him to act responsibly. For this they need knowledge of science.

In India, through the efforts of National council of Educational Research and Training (NCERT).Science has made compulsory subject through out the school stage. Even the National policy on education recommends as under:

"Every effort will be made to extend science education to the vast numbers who have remained outside the pole of formal educational"

WHAT SHOULD WE TEACH IN SCIENCE?

We teach '**content'** in science. We are passing the content to the students. But we also have to provide scientific knowledge as a package of process by which we can increase student's knowledge of external world. Teaching science implies involving our student's

investigation, so that they become 'scientists for the day'. Our students are to keep pace with increasing scientific knowledge. So we should teach them what they really need at a particular level. The content presented should be interesting that students understand it and not just memorize.

HOW CHILD LEARNS SCIENCE:-

Joseph Novak (1986) said that humans construct meaning into their ideas and experiences as a result of an effort to understand or to make sense of them.

Constructivism is dominant feature of science education. "**I hear and I forget, I see and I remember, I do and I understand**" shows the intent of constructivism. The hands on activities in science help to mobilize knowledge from head to hand, performing manipulative skills, doing observation, and taking reading, calculating the results and giving inferences share common intensions with constructivism. Science teacher should always mediate the learning environment .If you want to develop "creativity and scientific temper" do not give them ready made answers. It will help the learner to explore, construct, ideas and largely function as a facilitator of knowledge construction. Child should be made to arrive at the necessity of studying by unfolding their inner potentiality and instincts.

HOW TO DO SCIENCE?

It is the best known fact that to **learn science is to do science**. In order to do science, set up of good laboratories and good books occupy an important place? It is totally true that the good laboratories are basic in teaching science. The present laboratories in school are expensive to equip and maintain .Specific pedagogical needs, new technology and safety requirements contribute to the cost. As far as safety measures are concerned, they are most ignored in senior secondary school. In science to facilitate the process of going from observation to conclusion, science laboratories must adapt, expand and transfer to accommodate the experiments and instruments that are required to do that science. In an effort to get the most efficient use of facilities, our country should rethink about

Senior secondary school science labs to move toward more flexible approaches. It is the joint responsibilities of the teachers, administrators, and educationists to uplift the current status. It is the responsibility of the govt. also to maintain proper standard. It will then fetch positive results

HOW TO PRESENT, WHAT TO TEACH IN SCIENCE?-

British writer and philosophers had articulated a view of science as an inductive process .However teachers made few efforts to teach student's through well established inductive methods because textbook present the content as research paper .The goals for textbooks for sciences are theoretical emphasis, stressing the structure of scientific disciplines the benefits of basic scientific research and the importance of preparing young peoples for higher education in science. These goals have affected the nature of science education. Textbooks has been given a central and distinctive role in science education and science educators have suggested that benefits in learning accrue from using a proper textbook as it is a tool in the hand of a teacher. The content should be present in very logical, interesting and illustrated ways. This favorable tool able to emphasize and verify the learning objectives, prepare the students for an actual in-class laboratory experiment and serve as a experience for higher studies. Science textbook should enhance students understanding of concept in science, scientific practical skill, scientific "habits of mind:" and interest in science

WHAT DO SCIENCE TEACHERS DO?

The science teacher is the soul of the subject and the builder of student's future in science .It is only a science teacher who has to access the students in terms of their cognitive, psychomotor and affective domains. In schools, a science teacher is a substitute of parent, friend, guide and true Master of Science for the students. A science teacher cannot teach science unless he knows "**what really science is**" knowledge should not be up to memory level but to understanding level and extended to reflective level. Science teacher should be well skilled in applications of science. A science teacher can only inculcate scientific outcome if he himself has that quality, well educated teacher inspire and prepare students to investigate the questions of science and the questions raised by the discoveries which affect us and our society. He should plan his work and lessons well in advance and also responsible for the safety of the students in laboratory experiments, field trips, and projects.

ENRICHING SCIENCE CURRICULUM

Curriculum means different things to different people, now we entered twenty first century, .now science is for all up to class 10 .Then what type of science curriculum our children need. Some of the suggestions for enriching science curriculum at all levels are:

1. Postponement of specialization in particular topic from 9^{th} to 11^{th} class.

2. Uniform syllabus for all communities and environments

3. More concern towards scientific attitude instead of information acquisition.

4. No need to make books voluminous, so overemphasis on exercises should be avoided.

5. A large no. of outdoors oriented activities by the students to convey the ideas that science is not only to be studied in the class and laboratories but should become a part of life.

6. Focus on the dual nature of science i.e. content as well as processes of science.

7. Parents and teachers associations should be empowered and sit down to discuss to do some rethinking.

WHAT WE DO TO EVALUATE SCIENCE LEARNING?

If we analyze the examination questions very critically, we find most of the questions are asked to check i.e. evaluate knowledge of the concept, and very little emphasis is given to application and skill questions .Our examination questions should test all the objectives, if our objective is to develop the skill of reading a measuring cylinder,"our test should be, give a cylinder to the student and ask him to fill it up to 10ml,"instead of "how will you read a measuring cylinder. If we want to make them understand and draw parts of a flower for testing comprehension, our test should be, take a flower and now tell the name by seeing and draw a labeled diagram with proper illustration. Our existing education is examination-oriented, Though we identify objectives but they are just on paper .In order to develop the mental faculty of open – mindedness and to train students in the use and maintenance of science and equipment we have to balance between theory and practical evaluation .So our evaluation techniques should be compatible to achieve science objective i.e.

"**The Great end of life is not knowledge but action"**

WHAT MORE TO DO FOR 21st CENTURY-SCIENCE TEACHING

Professor Yashpal ,"There is no joy in mugging, joy lies in understanding, in finding out things on our own" Education policies come and go,. It is our solemn duty to do what the children what us to do. We can make science education more relevant and enjoyable and it can be done only by linking science education of a child with his immediate environment. It should be presented to the students as away in which they can conduct an inquiry. We are to change our science curriculum right from the school stage. Along with other features of scientific knowledge we have to teach scientific method. Students should be encouraged to become personally involved in solving problems and in discovering some for themselves

So if we are interested in making science teaching enjoyable. **Let's accept the challenge, nothing is impossible. When there is will, there is a way.**

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