SOME ASPECTS OF TEACHING METHODS IN INDIA WITH SPECIAL REFERENCE TO STATISTICS

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INTRODUCTION

The genius of Indian civilization is based on the eternal values of philosophy and religion. True education is that which helps in realizing this goal. Our educational system should not only provide information and equip us with knowledge but also ultimately manifest the spark of divinity within each individual. Now every system of education being at bottom a practical philosophy tries to be responsive to the needs and aspirations of contemporary society. Teaching is nothing less than a vibrant contact of one mind with another and this is an art which should not be reduced to a single set of unvarying laws and rules of procedure which can be used mechanically to achieve success.

Education can no longer be only matter of communication of skills, knowledge and techniques but will also be a major vehicle of social transformation in a comprehensive manner. It implies the transmission of culture from one generation to another. Good education should be able to train the minds of the students to develop critical intelligence and prepare them for real life. Before discussing some aspects of teaching methods in India, it will be both worthwhile and relevant to start with the ancient educational system of India.

THE ANCIENT EDUCATIONAL SYSTEM

Historical records convincingly prove that the ancient Indians were the first people on earth to make a systematic approach to the problem of education. In the course of their endeavours in the field of education the saints of India soon discovered that education means teaching, disciplining and training given by the adult members of a society to its younger ones with a view to befit them to face the struggles and secure the ends of life.

Since they felt the need to keep an eye for 24 hours on their wards, the ancient educators thought out the device of placing children with their Gurus i.e. teachers, under the same roof, for all the day and night. Thus GURUKULA (meaning the home of the teacher) SYSTEM' was followed in ancient India.

After ascertaining the competence of his disciple, Guru would teach him the Vedas fastening round his waist the threefold filament of Munja, a kind of grass, as the emblem of his vow to keep his body, mind and speech under control. The student was

introduced to different subjects of study connected with the four principal divisions of knowledge namely: (1)Anyikshaki (i.e. sciences derived from subjective or metaphysical speculation involving keen introspection) (2) Trayi (the three vedas) (3) Varta (subjects relating to agriculture cattle rearing and trade) and (4) Dandaniti (science and art of government) under competent teacher.

The old system of education in India was very different from the modem system. The students had not to pay. It was thought that knowledge is so sacred that no man ought to sell it. Not only so, most of them gave their students food and clothes.

After completing the course in Gurukulam, students went to some institutions in search of higher studies. The earliest and greatest institutions were those of Banaras and Taxila. The latter's fame as a seat of learning was of course due to that of its teachers in the 6th century B.C.

After graduation students undertook extensive travels to understand the ways of the world and the manners of different types of people.

Ancient Indian literature does not furnish much evidence on the subject of industrial and technical education, though it was upon the basis of such education that ancient India was able to build up her own economic life and figured in the ancient world as the chief exporting country.

However there is evidence to show that Statistics would have been one of the subjects taught. Kautilya's Arthasasthra is a Sanskrit text, written in a period around 600 B.C. While describing the duties of different officials, in chapter 2, it says that there had to be a person to mark the animals that were a month or two old or that had stayed in the herd for a month or two. Also the branded mark, the natural mark, the colour, the peculiarity of the horns - with these characteristics the should record additions to the herd. Another person should look after one hundred animals containing an equal number of aged cows, milk cows, cows with young, cows with calf for the first time and heifers. Thus we understand that people of ancient India were conversant with the topic 'Association of Attributes'.

In the same chapter Kautilllya has given that statistics and records about all agricultural and other properties in the village were to be maintained by officials, known as 'gopas' and 'sthanikas'. Hence we see that Statistics had been taught even in old days.

Thus the ancient Indian educational institutions were the spiritual rendevors of all

those who desired to realise truth. Moral education and character building in addition to intellectual learning formed the essential features of such systems.

ROLE OF A TEACHER

Due to long and continuous domination of religious and spiritual features of Indian life, the teacher has been playing the key role in Indian education. Even in the modem educational system the teacher is the most important component as far as training of the students is considered.

The potential of any system or a curricular innovation is directly related to the ability of its teacher. No matter how distinguished the curriculum innovators are, how carefully structured a new course is, how brilliantly the educational media has been explored, the success or failure of any innovation ultimately hinges on the receptiveness and flexibility of the classroom teacher. Nobody ever realised that a bad curriculum well taught is far better than a good curriculum badly taught.

The person who teaches a subject to himself learns automatically. As Plutarch put it, “The mind is not a vessel to be filled but a fire to be kindled.” It is the teacher’s task to kindle this fire.

The first requirement is that a teacher must have a sound knowledge of the general character of the subject and its place in our culture. His base must be broad and information comprehensive.

A good teacher may prove to be quite influential in establishing and improving the standard of the students. An ancient Tamil text “Nannool” says that he has to teach according to the grasping power and standard of the disciples and gradually make them express themselves. It is necessary to build up an intuitive awareness of his impact upon the listeners receptive faculties.

A true teacher realises that he has a debt to his successors and to society to pass on the torch of learning he has been handed. Teaching is not an exact, well-defined activity; it is a very difficult and demanding profession. It requires a continuing programme of self improvement and professional development if it is to be practised effectively.

Generally any teacher at the college level will not have had any course in teaching methods. Probably he will be guided or at least strongly influenced by the methods used by the teachers who most impressed him during his studies and his own feelings about how he would like the subject to have been taught that he is now teaching to others.

Sometimes the first factor may have a somewhat negative effect in that he may try

to avoid the monotonous teaching to which he was subjected. However, from the most inspiring of his college teachers he learns the importance of an informal style that permits the class to interrupt for questions, to request repetitions or to point out errors the instructor has made**.**

To say briefly, a good teacher has to guide the students towards the point at which the really difficult thinking and experiments can begin. Fortunately, with the coming up of the University Grants Commission, a positive effort has been made to improve the quality of teaching and research in India. A description of the present educational system in India follows.

THE PRESENT EDUCATIONAL SYSTEM

Educational development in India was not uniform. Different castes, communities and regions had different rates of growth.

In 1757 when the East Indian company embarked on its political career in India, both Hindus and Muslims had their own indigenous systems, each deeply rooted in a great tradition of learning and scholarship behind them. The earliest efforts to introduce any form of education beyond the indigenous has emanated from the missionaries. In 1770's schools were started to teach English to Indians. An educational policy laid down in 1835 and reaffirmed in 1854*,* was on the whole adhered to till 1947. Then came the dramatic and democratized change in the education system when India got its independence. One could cite apparently impressive details of the growth and expansion of the Indian educational system over the last five decades. The number of schools, colleges and universities has risen manifold but unfortunately not the quality of education.

Indians are 1/6th of the world populations but their share of mathematicians and statisticians in the world is a massive 1/3. But if you take 100 top ranking journals in mathematics and statistics, there are hardly two or three from India. This brings out the sad state of research in India. The potential is, of course, there but not the infrastructure and encouragement.

Most of the teachers teach text books rather than the subject and to be more precise, they teach what was taught to them when they were students. Also an excessive emphasis on examinations dominates the teaching methods and encourages cramming and parrot-like repetition. At the moment, we seem to be working merely for the sake of exams whereas we should work to satisfy our curiosity.

In many schools, students mechanically copy down what is written on the blackboard and close their minds. Sometimes even blackboards are not available in some remote schools and teachers teach only orally.

As we know, during the last sixty years momentous developments have taken place globally in different branches of statistics, leading to outstanding achievements in many interdisciplinary areas. But unfortunately the present Indian educational methods have not kept pace with the explosion of knowledge. In spite of all these things, the traditional method of classroom teaching has been supplanted by new and sophisticated methods of instructions in a few institutions on an experimental basis.

HOW TO IMPROVE THE PRESENT TEACHING METHODS

While one can talk a lot about the present system being an extension of the inherited colonial system, our failure to bring about the requisite changes must be accepted. However what is needed is not a change in our conceptual mechanisms which have proved their functionality over a long period of time but rather to be more sensitive in our minds to the needs of the society.

But changing the teaching methods requires little training in educational psychology, in educational philosophy or in the subject matter to be taught, while improvement needs a high degree of each. Again, change is concerned only with “What a child can learn?” but improvement is concerned with infinitely more profound question “How a child can learn?”. Remember that educator’s easiest task is to change the curriculum but one of his most difficult jobs is to improve it. Thus, the improvement depends upon the craftsmanship of the frontline workers, entrusted with the job of teaching it.

Our improved courses and syllabi should emphasise relevance and applications to the real world. For example, life insurance, fire insurance etc. are some of the conveniences of modern social life. But when we were feverishly working problems on probability, how many of us were made to realise that the theory of probability had anything to do with insurance?

Also children at first do not first do not feel the need for an abstract deductive system of knowledge and cannot therefore appreciate it. Almost all the text books give no better idea of the term ‘Average’ than the following. “To find the average of a set of numbers divide the sum of the numbers by the number of numbers”. Many problems may follow this definition. But not a single example shows why all this trouble of adding and dividing is taken.

Consider the following problem. (1) “By repeating an experiment ten times, a boy gets ten different results. Which shall we take as his representative result? (2) To which height does a coconut tree grow?”

These problems do not contain the word ‘average’ but they bring out the real meaning of the word. A student can profitably be initiated to new topics with such illustrative examples, whatever may be the subject taught.

Also wherever possible, the curriculum has to be designed that it can be related to the local environment. The village school, the tribal area and the urban school may do the same topic in Statistics but use different examples drawn from their respective environment. For instance, when the topic of correlation is discussed, the problems for the urban students can be taken from import and export, income and expenditure, share prices and debenture prices etc., while those for the rural students can be related to amount of rainfall and yield demand and supply, height and weight etc. The tribal area students can have problems from density of population and death rate due to a particular disease, the age of a tree and its weight and so on.

Anyway the arbitrary drill problems have to be replaced by exciting statistical projects each of which has a definite mathematical purpose. At the end of the projects there will be definite increase in statistical knowledge. Such projects are possible while dealing with topics like association of attributes, index number, analysis of variance etc.

The ability to compute is not, as a rule, indicative of mathematical competence. But manipulative skill cannot be ignored in such a highly symbolic subject as Statistics and indeed it must be acquired . Hence in the improvement process, some of the new programming and computer methods may take over most of the teaching of manipulative skills, leaving class time for motivational and conceptual aspects of the topic.

Adding to that, the purpose of Statistics is not so much the learning of calculations as the understanding of the numerical and quantitative situations which social life presents and the ready ability to deal with them. For example, Galton applied Statistics to the measurement of inheritance of stature by computing the coefficient of correlation between the stature of children and that of their parents. The expression and the calculations of the results of the Mendelian laws of heredity in Biology are an example of the use of ordinary high school mathematics while at bottom they are fixed by laws of mathematical probability.

So, if the students are given modeling opportunities (real, open ended projects with no set answers) they will both enjoy and appreciate the subject more. Since Statistics

comprises the science of decision making in the face of uncertainty, any teaching method provide the framework for looking at all situations involving uncertainties and risks, in a logical and systematic way.

As Swami Vivekananda, a great Indian philosopher, says, the very essence of education is concentration of mind, not the collection of facts. Also unless curiosity is recognised and given its due place, creativity will find a back seat in educational process. Thus the ultimate aim of any teaching method should be to develop concentration of mind and to awaken curiosity for independent and logical thinking which ultimately will reach the higher level of research.

Accordingly, research is also a part of education. Good research in any subject cannot be done in isolation. We need constant intellectual rejuvenation by talking to colleagues in the same area, going to conferences and collaborating with others. To make it possible fund is essential. Though Indian services like University Grants Commission Department of Science and Technology etc., are there to give us that additional flexibility and freedom, more and more finding agencies should come forward to extend a helping hand to those research scholars.

CONCLUSION

As a very old civilization, India has proved as a laboratory of experiments and new discoveries in the past. Our educational system need not make a complete break with it. For there is much that is good there which can be used to shape and reorder contemporary Indian society along the desired directions.

Still, India needs a dynamic educational system which continually undergoes renovation and innovation. For that we have to make our academic institutions to be incubators of new ideas and creative independent thinking. We should teach in order to develop the learner and not to develop the subject.

Establishing a hall mark of quality in Indian teaching methods may be considered a Utopian dream by some. Yet most our Indian educationalists are aware of the momentous issues. So we, Indians, are still optimistic about the improvements of our teaching methods which will lead to a climate of inquiry and thought. That in turn will lead to a fast expanding intelligentsia drawn from the diverse social classes of Indian society.

Let me conclude by appealing to our academic community to develop the spirit of inquiry, motivation, independent thinking, originally of approach and above all self-confidence among the newly emerging and highly dynamic group of young students.