

Rudiments of Teaching and Learning

Dr. (Prof.) V.C.A. NAIR

Educational Physicist and Internal Research Guide for Physics at JJT University, Rajasthan, India.

Abstract

A generalized treatment based on the personal teaching experience of author for more than four decades. The present day teaching scenario is compared with that of olden days. Methods of teaching are not dealt with in detail. Student-Teacher Interaction and Faculty-Interaction which form the basis of Teaching and Learning processes are included. Concept of Theory and Practical are made clear in the Teaching-learning process. Requirements of a good Teacher and a good Student are enlisted. Study time tables are prepared for students during working days, Sundays, holidays and during vacation. Various quotations and sayings of eminent intellectuals and scholars highlighting the importance of teaching and learning are also given. The paper ends with a rhythmic song exclusively prepared by author for a Teachers' Day (5th September)

Key words

Faculty Interaction, Learning, Practical, Student-Teacher Interaction, Teaching, Teachers' Day, Theory, Time Table

I. Introduction

I would like to present here a comparison of the present day teaching and the type of teaching in the olden days. In the topics that follow the reader might find each one a separate entity with certain points repeated from the previous one. This is because those topics are separate modules presented by author at various places on different occasions. Requirements of a good teacher and a good student, a systematic time-table for study and certain points for increase of knowledge are added so as to maintain quality to the learning process. The teaching and learning process being age-old, I have added sayings and quotation from eminent men. The readers can sing a song on Teaching at the end.

II. Present and past scenario

Teaching is a process of imparting knowledge to a student or group of students who learn from the teaching done by the teacher. Thus learning is also a process and these two processes of teaching and learning form two sides of the same coin. Any process or procedure of letting one know what he does not know can be taken as teaching.

Teaching is done in class rooms. In the present day class room, in addition to black board, duster and chalk, there has to be air conditioners, projectors, charts and many more. The teacher has to be a qualified personnel satisfying the conditions laid down by the Education Department or government. This is a necessary condition even though the teacher may or may not be capable of teaching.

In Fig.1 is shown an executive delivering lecture to some delegates in a seminar room or a mini hall with lot of facilities. In Fig.2 is shown a modern Class Room with black board, projector, screen, etc. The teacher has asked one of the students to give a presentation. If you notice carefully you find that the attendance is poor. The students are not properly and evenly seated. A picture with deficiency is purposely shown to emphasize the requirement.

For proper and effective teaching, a teacher needs both 'Attendance' and 'Attention'. (Fig.3) The former is the physical presence of the students in the class and as 'Human Brain is People' (Fig.4), whether there is attention is known only to the student. In this connection, I have developed my own philosophy, "Failure to study Human Mind is the Weakness of Mankind". An experienced teacher can judge from the facial expressions of the students their understandings. Teaching is taken as a noble profession, but it is not an easy profession. A teacher has to develop techniques in

order to make the students of today a majority of whom have no interest or lack discipline. A teacher has to engage a class room of 50 students or sometimes 100.



Fig.1 : An Executive is taking Lecture to a team of Delegates

Students' brains work differently and as you know "Human Brain is People" (Fig.4). Where is the teacher of today who drives things into their brains? An incapable teacher simply draws government salaries and when it comes to class room teaching, he is a lone soldier in a battle field. Thus the need of the hour is to gear-up the brains (Fig.5) of both the students and specially the teachers by giving rigorous training and holding special workshops.

Now, coming to the ancient type of class rooms, have a look at Fig.6. The school is almost a hut under a tree and students who are called as 'Shishyas' in Sanskrit meaning 'Disciple' are seated on mats on the floor along with the teacher whom we call as the 'Guru'. The *Guru-Shishya Parampara* meaning "Teacher-Student Cult" is ancient. In the figure you find there are 8 students which is a large number in those days as compared to the present day's population.

As a picture speaks thousand words, if one looks carefully will find that the teacher is serious in his work of teaching and the students are well in attention.



Fig.2 : A Modern Class Room

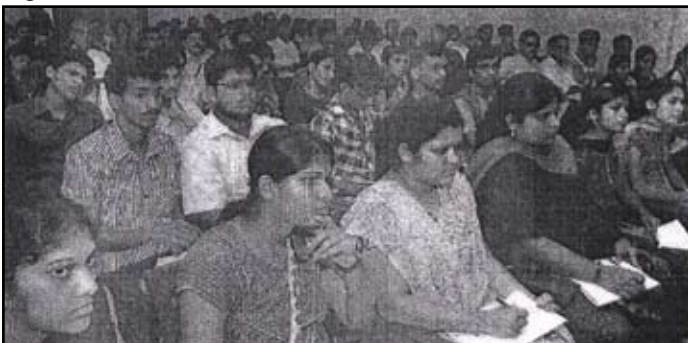


Fig.3 Audience in a Class Room showing Attendance and Attention (Assumed)

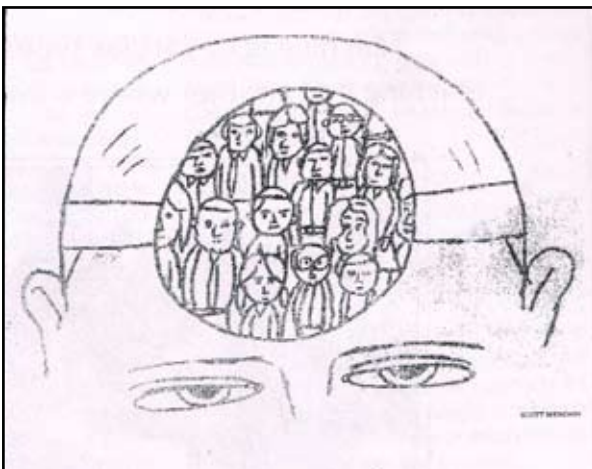


Fig.4 : HumanBrain is People

Among the students seated and very near to them is a student standing and writing probably due to some punishment imposed on him by the teacher. Also you find another student standing far left and slightly away from the scene. He is only allowed to observe and not allowed to take part in the learning. Well He is a late comer and hence he is punished. Late coming is also ancient and why we should not punish the present generation of students for the same? Source of Drinking water for the Shishyas is in an earthen pot seen at bottom left and for the Guru it is in a small earthen pot kept at his side.

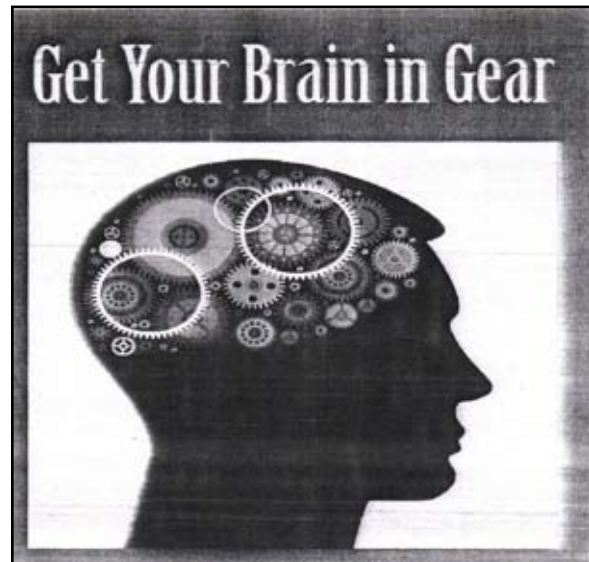


Fig.5 : Gear-up your Brains

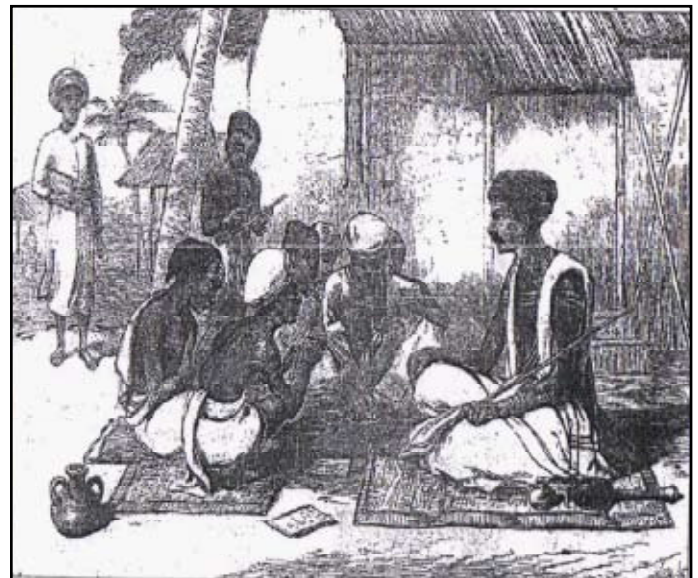


Fig.6 : An Ancient Indian Village School

Faculty Interaction

I was for sometime an HOD Science and Humanities in a Polytechnic where during a Faculty Interaction held on 17th December 2005, I presented a topic on “Techniques and Technicalities of Teaching” to the members of teaching staff and the same is reproduced below:

KiranPatel Education Trust's
Sardar Vallabhbhai Polytechnic,
Borivli(West), Mumbai-400103.

Date:- 17th December 2005

Faculty Interaction

Subject:- Techniques and Technicalities of Teaching

.... Compiled by Prof. V.C.A. Nair,
HOD, Science and Humanities

Q. What do you mean by ‘Teaching’?

A. ‘Teaching’ is a process of letting one know what he does not know.

Teaching is divided into two parts. They are:
Class Room Teaching (Theory) and

Laboratory Teaching (Practical)

A. Class Room Teaching (Theory)

1. Q. What do you mean by 'Theory'?

A. From the point of view of technical education wherein we deal with science and technology, by 'Theory' we mean 'AN ORDERED SCIENTIFIC CONCEPTUAL SCHEME'

2. Be punctual for the lecture

3. Greeting: Students usually greet. If not, you greet them.

4. Condition of Class Room/Lecture Hall: Windows duly opened or AC started, Benches

and Desks in proper order and well-cleaned black board, etc.

5. Difference between a Science college and a Polytechnic:-

Science College:- conducts conventional courses – Less work and more available time

Polytechnic:- conducts professional courses – More work and less available time (Term-

work, Sessional work, Workshop, Drawing, etc.).

6. Student-Teacher Interaction: Should be effective, constructive and useful. It should be

noted that "Aim of Teaching" is the same whether it is primary or post-graduate.

Tell the students to look at the face of the teacher when he speaks. This helps in

drawing their attention.

Noite the following points:

a) Number of students less or more, engage them
b) Student and Teacher – Two basic elements in the field of education with the former having variable habits.

c) What is required is both 'ATTENDANCE' and 'ATTENTION'.

d) A separate note book for the subject you teach and check it periodically to ascertain they have brought it.

e) Students should write whatever teacher writes on the black board starting with the date of lecture.

7. Method of teaching

I. General

Expression and Impression:- In order to create good impression among the students, the teacher should have good expression. By expression is meant wearing neat dress, promptly taking the lecture, speaking grammatically good English, etc.

Discipline: A teacher should be first disciplined to enforce discipline on students

Knowledge:- Proficiency: A teacher is qualified as per requirements of government.

Experience: Efficiency: Related to years of teaching.

Quantity and Quality:- Create more quantity of learning by enforcing good quality of teaching. Make students feel that the teacher in front of them is somebody knowledgeable

II. TTTI (Technical Teachers' Training Institute) Bhopal Concepts:-

K C A (Knowledge, Comprehension and Application) concept.

Train the Trainer

Better Learn than Teach.

III. Conventional Teaching

Black board, Duster and Chalk.

When the teacher just starts teaching, some (few) students are not interested. Hence adopt methods to create interest.

Re-call the previous topic. (Date will help).

Write on black board. Avoid dictation.

Read and explain what you have written on the board.

There should be more writing both by the teacher and the student.

If the teacher does not write, how can a teacher expect the student to write? (All students should have written notes for their study).

Remember to reproduce 40%, the students should grasp and understand at least 60% of the teaching.

Self-assessment and Evaluation: After every lecture, the teacher has to assess and evaluate himself/herself of having done justice to the job. This is rarely done. An inexperienced and incapable teacher simply escapes and after the lecture he feels as a good riddance

(B) Laboratory Teaching (Practical)

Philosophy:- "The Work of Science is to substitute Facts for Appearances and Demonstrations for Impressions" John Ruskin, 1839

1. Q. What do you mean by 'Practical'?

It is the work you carry out in a laboratory with the help of instruments/equipment in order to verify certain theory or law. In the modern days of syllabus change, a practical can also be some writing work assigned in subjects like Mathematics, Generic Skills, Professional Practice, etc.

2. Reception:- Is the teacher present to receive the students in the laboratory?

3. Discoveries have taken place in laboratories – 50% weightage and hence the importance.

4. Working Apparatus/Equipment – If not working, make it work.

5. Actual Demonstration by teacher required.

6. Group working – Working in a team (Creates interest and more discussion)

7. Observation and Reading – Two basic elements in any practical. Reading is record of an observation.

8. Writing the manual – A manual or journal is the record of performance in a practical – Use whatever remaining time of 2 hours for the same

9. General up-keep and maintenance of equipment - Cleaning, lubricating, replacement of parts, etc.

10. Mini workshop – Keep tools such as screw driver, hammer, knife, file pliers, etc. for maintenance. A 5 kg vice is a must.

The above presentation created lot of discussion and questionnaire among the faculty members.

IV. What Teachers should know/have

1. Good general conformation

2. Good behavior

3. Excellent command of subject

4. Punctuality

5. Absolutely no short temper

6. Teacher is required because of the presence of students. Hence take students in high esteem

7. Be kind and lovable.

8. Use the black board and talking (explaining) equally.

9. If the teacher does not write on the black board, how the students will write on their note books?

10. The government and hence the management says that the teachers are largely responsible for the failure of the students. This indicates that the work and responsibility of a teacher

is much more than of the student.

your progress. Hence love and respect them

11. Try to compete with the best student in the class\

V. Few Requirements of a Good Student

1. General conformation
2. Cleanliness
3. Regular habits
4. Discipline
5. Greeting
6. Following a Time Table
7. See that books as per time table is carried before leaving the house
8. Avoid answers such as:
“FORGOT”, “SORRY” and “NEXT TIME”
9. Even if one is rich, create a feeling that you are one with others.
10. Your parents, sisters and other family members depend on

VI. Time Table for study

A general complaint from the students specially the lazy ones who waste their times watching TV or playing cricket is that they do not find time for an essential work such ‘study’. As learning is a process, ‘Study’ is also a process to be carried out with full concentration and devotion. One cannot lean without studying. Thus, studying and learning are also two sides of the same coin. You have not learned because you have not studied. That is study is inherent in learning. I have divided the time table into 3 . One during working days, second during Sundays and holidays and the third one during the days of vacation. They are given in Table No.1, 2 and 3.

Table 1 :During Working Days

Time allotted for study	Timings	Activity
	5.00 AM to 5.30 AM	Exercise on empty stomach
	5.30 AM to 6.00 AM	Taking bath, breakfast, etc.
2 hours	6.00 AM to 8.00 AM	Study as per time table prepared by the student
	8.00 AM to 9.00 AM	Travelling to the School/College
	9.00 AM to 4.00 PM	Attending School/College
	4.00 PM to 6.30 PM	Travelling back to home/Relaxing/Sports
1½ hours	6.30 PM to 8.00 PM	Study as per time table prepared by the student
	8.00 PM to 8.30 PM	Dinner, Watching TV, Going through News
1½ hours	8.30 PM to 10.00 PM	Study as per time table prepared by the student

5 hours Total Time available for Study during each working day of the week

Table 2 : During Sundays and Holidays

Time allotted for study	Timings	Activity
	6.00 AM to 6.30 AM	Exercise on empty stomach
	6.30AM to 7.00 AM	Taking bath, Breakfast, etc.
4 hours	7.00AM to 11.00 AM	Study as per time table prepared by the student
	11.00AM to 12.30PM	Relaxation and Lunch
3 hours	12.30PM to 3.30 PM	Study (Confined to Writing)
	3.30PM to 6.30PM	Watching TV, Sports, News Paper Reading
2 hours	6.30PM to 8.30PM	Study as per time table prepared by the student
	8.30PM to 9.30PM	Dinner and Relaxation with family

9 hours Total Time available for study during each Sunday or Holiday

Table No.3 : During Vacation

Time allotted For Study	Timings	Activity
	6.00 AM to 7.00 AM	Exercise on empty stomach
	7.00 AM to 8.00 AM	Taking bath, Breakfast, etc.
2 hours	8.00 AM to 10.00AM	Coaching Class or Tutorial
2 hours	10.30AM to 12.30PM	Study of some lessons of future standards
	12.30PM to 2.00 PM	Lunch and Relaxation
3 hours	2.00PM to 5.00 PM	Study continued
	5.00PM to 7.00 PM	Sports
	7.00PM to 8.00 PM	Watching TV and News Paper Reading
	8.00PM to 9.00 PM	Dinner and Relaxation

7 hours Total Time available for study during each day of Vacation

VII Education: 'Education is very much related to 'Teaching. If you train or instruct intellectually, morally and socially, it is 'Education'. An educationist should necessarily be a good teacher as otherwise, he cannot impart education. The great philosopher, Aristotle said "*Education is an ornament in prosperity and a refuge in adversity*". The concept of 'Teaching' is inherent in 'Education'

VIII. Gain of Knowledge

What we understand from the above treatments is that whether student or teacher it is the knowledge that counts. The teacher imparts knowledge and the student tries to gain knowledge. The word 'knowledge' follows from the word 'know'. There are things which you know and there are many things which you do not know. At the same time there are things which others know but you do not know. Can you create a situation when you know all the things all the time? Well then that is the requirement. I shall give below few simple steps to gain knowledge.

1. Try to know what you do not know
2. Try to know more than what you know.
3. Try to know what others know.
4. Try to know more than what others know.

If you follow these four steps you will always be a knowledgeable man.

The question now is, "knowledge of what". Knowledge about anything around us. It is better for me to give at this juncture the definition of 'Science'. 'Science' is a systematized **knowledge** about anything in the universe. Another thing about knowledge is that possession of knowledge is always in comparison. One may have more knowledge than the other person and vice versa. Thus while holding interviews and oral tests, the candidate might know more than the interviewer and hence do not ask questions the answers of which are not known to you. Always keep in mind the following:

"I DO NOT KNOW WHAT YOU KNOW AND YOU DO NOT KNOW WHAT I KNOW"

IX. Quotations and Sayings from authors and scholars:

I would like to enumerate few quotations and sayings from eminent authors and scholars. Being their own words, I give them in italics. I start with the one by the Nobel Prize winner, Albert Einstein.

1. "*I never teach my pupils. I only attempt to provide the conditions in which they can learn*" ...Albert Einstein
2. "*A teacher is one who makes himself progressively unnecessary*" ...Thomas Caruthers
3. "*It is rightly said that 'the mediocre teacher tells. The good teacher explains. The superior teacher demonstrates, but the great teacher inspires*" William Arthur Ward.
4. "*Education is an ornament in prosperity and a refuge in adversity*" ... Aristotle.
5. "*Don't try to fix the students, fix ourselves first. The good teacher makes the poor student good and the good student superior. When our students fail, we, as teachers too have failed*" ... Marva Collins
6. "*A poor surgeon hurts one person at a time. A poor teacher hurts 130*" ... Earnest Boyer.
7. "*What the teacher is more important than what he teaches*" Karl Menninger
8. "*Teaching is the only major occupation of man for which we*

have not yet developed tools that make an average person capable of competence and performance. In teaching, we rely on the naturals, the ones who somehow know to teach"

...Peter Drucker

9. "*To me the whole hope of human salvation lies in Teaching*" ... George Bernard Shaw

10. "*Education is a better safeguard of liberty than a standing army*" ... Edward Everett.

11. "*The whole purpose of education Is to turn mirrors into windows*" Sydney J Harris

The so-called "Guru-Shishya Parampara" started in ancient India which has produced eminent teachers and devoted students. One such eminent veteran teacher is late Dr. Shri Sarvapalli Radhakrishnan (1888 -1975) who was born on 5th September 1888 and became the first Vice President and later President of Republic of India.. As 5th of September is the day of his birth and in order to honor him, that day 5th September every year is celebrated as "Teachers' Day" by all educational institutions in the country.

As a teacher myself for considerable period, I have composed a rhythmic poem which I would request readers to recite the same and be in high spirits.

X. Teachers' Day

(Saturday, 5th of September 2015)

Today is Teachers' Day

Which we all remember

Because it is Dr. Radhakrishnan's Birth day

Which comes on every 5th of September

Today is Teachers' Day

Which came this year on a Saturday

It is a duty to observe this day by each teacher member

For which we have all gathered here in large number

Teachers have been working with Black board, duster and chalk

In addition, they have lot of things to Talk

Students love teachers and teachers love them

And throughout the day teachers teach all of them

Teachers tell students "Be prepared"

And students feel to be the most "Cared"

Teaching is taken as a noble Profession

And all teachers are proud of this Possession

Teachers' work is more responsible

As for others such work is most Impossible

What we are today is because of Teachers of days of yore

Who gave us lot and taught us much more

They were those who made Impossible possible

Because they were the most responsible

Oh Let us salute all those teachers

Some of whom were the best Preachers

Today is Teachers' Day

When we all try to be more sincere on this particular day

We have gathered here to observe Teachers' Day

And let us all really make and call it a Day

We all wait for next Teachers' Day

To make it more merry and gay

Conclusion

In the Paper I have not dealt extensively with the methods of teaching, the behavioral aspects of the students in the class rooms and their control by the teacher to maintain brevity and to avoid

running this paper into pages. A general requirement what we understand from the above treatment is that, it is essential for the teacher to understand the student before teaching him. For this, a detailed counseling of the students may be needed and as the number of students is large this is a difficult task. In the same lines as the teacher should understand the student, the student should also try to understand the teacher which is a rare case. If there is such mutual understanding, the two processes of teaching and learning will move in unison and be effective.

At the end, I would request the readers to read between the lines of this paper and understand the spirit behind them.

Dr.(Prof.) V.C.A. Nair (b. 15th Aug. 1939) is an Educational Physicist, Counselor, Research Guide and Consultant. He did his Masters from Mumbai University, India and Ph.D. from JNT University, Rajasthan also in India.

He has to his credit over 4 decades of teaching Applied Physics in eminent Polytechnics in Mumbai and having taught nearly 16,000 students since 1965. He has published a number of research papers in Physics and is a Life Member of Indian Society for Technical Education which is an all India body. He had been to USA a number of times and visited eminent Universities such as Stanford, Harvard, MIT, University of California both at Berkeley and Los Angeles and University of San Francisco.

References

This Research Paper is exclusively prepared from the vast teaching experience of the author and throughout the subject matter of the paper there has not been any review of literature and hence no references. The figures are from local dailies and magazine

Profile



Dr.(Prof.) V.C.A. Nair (b.15th Aug. 1939) is an Educational Physicist, Counselor, Research Guide and Consultant. He did his Masters from Mumbai University, India and Ph.D. from JNT University, Rajasthan also in India. He has to his credit over 4 decades of teaching Applied Physics in eminent Polytechnics in Mumbai under the Department of Technical Education, Government of Maharashtra thus

having taught the subject to over 16,000 students since 1965. He has published a number of Research Papers in Physics in reputed International journals and is a life member of Indian Society for Technical Education (ISTE) which is an all India body. He had been to USA a number of times and visited eminent universities such as Stanford, Princeton, Harvard, MIT, University of California both at Berkeley and at Los Angeles and University of San Francisco