



**GRD Centenary Year Celebrations  
An Inspiring Teacher in You**



**28-Sep-2013**

**A Workshop on Effective Teaching of Engineering Mathematics  
Department of Mathematics  
PSG College of Technology, Coimbatore**

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*G R DAMODARAN*

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*A teacher's influence over his students is immeasurable. Other people's children come before him at a time when their minds and hearts are most receptive to new knowledge. They have their prejudices and limitations, but what they do not have is the cynicism of the adult. The values of their parents or their social class have not yet hardened around them. To draw out the best in each of these young people is the teacher's ideal. This is no light undertaking. A teacher cannot assume that, when he stands before his class, his compelling personality will draw all pupils to him like a magnet. Some it will attract; others it will repel. Teaching is a rewarding profession, but it also commands its price. To transmit knowledge, to make it clear, to relate it to the interests and capacities of all students—these functions require consummate power and skill.*

— GEORGE F. KNELLER

# *the teacher in you*

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## PREFACE

In the different colleges for higher education in our country there are admitted some of our finest young men and women. This lays a heavy responsibility on the teachers who are entrusted with the task of training these young intellectuals to creative effort. This is obviously an exciting and fascinating adventure for which all teachers have to be well equipped. Most of our teachers can claim to be extremely well learned in the fields of their specialisation but not all can claim to have acquired masterly insights into the profession of teaching. Nor do we at the university level spend time to think on the essentials of teaching, though we are well versed in the subject we teach. For instance, an engineering teacher tends to regard his teaching role as somewhat secondary to his role as an engineer. A collegiate lecturer tends to concentrate on his subject rather than on the art and science of teaching. It remains true, nevertheless, that unless he develops in some way professional competence as a teacher as well as an engineer he jeopardizes the effectiveness with which he can operate his dual role in society.

It has, therefore, been proposed to present in this booklet some ideas which might prove helpful to teachers of this level. It is not offered as a fool-proof formula for teaching. It is recognised that it would be presumptuous to tell experienced and successful teachers how to teach. But an apology may be found for presenting these ideas in that it is an effort made to distil from the success of eminent teachers, some of those principles which have gained a recognised significance and to set these down in an orderly fashion as a starting point for further development and improvement.

The purpose of this booklet becomes activated only if and when members of the teaching profession at the university level, become actively involved in practising and testing out the validity of the methods suggested here.

Suggestions for the improvement of this booklet will be very much appreciated.



## **UNIVERSITY OF MADRAS**

University Buildings,  
Chepauk, Madras-5,  
*Dated 1st April, 1960.*

I have read the pamphlet, "Teacher in you," from cover to cover, as it presented a fascinating idea of the many problems which a teacher has to face. In these days when the profession of teaching has attracted a very large number it is necessary that those who take to teaching must try and appreciate what their responsibilities are and what their functions are likely to be. Teaching, they say, is the noblest of the professions, not because of any pecuniary considerations but because it gives the greatest satisfaction, when the work is well done, that the teacher has kindled one more spirit and lighted one more lamp so that in ever increasing lustre, darkness and ignorance may ultimately fade away.

Many practical suggestions have been made in this pamphlet which deserve the careful attention of the prospective teacher. Knowledge is not enough for a teacher but the means of communicating that knowledge in such a way that it will kindle the spark of enthusiasm and a keen desire for the pursuit of knowledge is what is most needed. In this pamphlet many excellent suggestions have been placed for the consideration of the teacher and I hope that the would-be teacher, in whatever sphere of learning he may find himself eventually, will realise and effectively practise what is given in such a stimulating manner. The pamphlet, I hope, will be made available to a large number of teachers.

(Sd.) **A.L. MUDALIAR,**  
*Vice-Chancellor*

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## CHAPTER 1

### INTRODUCTION

*"If India is to confront the confusion of our time, she must turn for guidance, not to those who are lost in the mere exigencies of the passing hour, but to her men of letters and men of science, to her poets and artists, to her discoverers and inventors. These intellectual pioneers of civilization are to be found and trained in the universities which are the sanctuaries of the inner life of the nation".*

—REPORT OF UNIVERSITY EDUCATION COMMISSION

The primary aim of a college is to give to its students a sound education in preparation for the responsibilities of mature citizenship through the disciplines of a broad, rich and extensive curriculum. In addition a college has an inescapable commitment to the discovery of new knowledge.

Teachers, students and curricula are the three major components of any educational institution. Buildings, books, classes, degrees and all the other appendages of academic life are aids in the teaching-learning process. The most important of all is the relationship of the teachers with their students engaged in the pursuit of learning. Perfect team-work should exist between you—the teacher and your students if the objectives of education are to be realized. In fact, the success of education is to a large extent dependent on the quality of teamwork between the teachers and the taught.

As a teacher you must be willing to be an eternal student so that you might inspire your student not only to learn what is taught but also to become his own teacher. Tagore observes that a teacher can never teach unless he is still learning himself. 'A lamp can never light another lamp unless it continues to keep its own flame burning.' The student may not know everything, but he must learn how to find out what he does not know. He must thus develop the skill of acquiring new knowledge and then of applying it wisely.

As a teacher you expect your students to possess the ability to learn and the desire to learn. Likewise you must have qualities of inspirational leadership and the desire to teach. You must have a mastery of the subject of your specialization with an intelligent appreciation of the points of contact which your subject makes with different fields of study offered within the campus. Along with this integrated insight you should also possess the ability to put across your knowledge to your students in a vigorously living and meaningful way.

As pointed out by Gilbert Highet the teacher should know much more than his subject and his students. "The good teacher is a man or woman of exceptionally wide and lively intellectual interests.....Teachers in schools and universities

must see more, understand more than the average man and woman of the society in which they live. This does not only mean that they must have a better command of language and know special subjects which are close to theirs. It means that they must know more about the world, have wider interests, keep a more active enthusiasm for the problems of the mind and the inexhaustible pleasures of art, have a keener taste even for some of the superficial enjoyments of life and spend the whole of their career widening the horizons of their spirit."

As Bertrand Russell puts it, "the purpose of teaching should be from the pupil's point of view partly to satisfy his curiosity, partly to give him the skill required in order that he may be able to satisfy his curiosity himself." What you teach must not only inform but also inspire.

You must be aware of the objectives underlying the courses you are called upon to offer and hold yourself responsible for achieving these objectives in your students and this should be the basis of all your teaching. You must be able to put across your subject matter in an understandable manner abstracting the essentials from the nonessentials; you must set up standards of attainment keeping in view the potentialities and capacities of the student. You must enable the student to assume responsibility for his own learning. Your evaluation and grading programme should be designed to assess how far this sense of responsibility has been acquired by him. You must also help the student to acquire a balanced view of life by suitable guidance and counselling.

Education deals with human growth—in mind, spirit, character and effective behaviour and every subject we teach should serve as a tool to achieve this objective. The comprehension and mastery of a subject is important; but progress towards the ulterior goals of instruction is more important. A student is likely to forget tomorrow what he has learned today. The habits and attitudes he acquires, the interests he cultivates, the ideals he learns to practise—all these become basic for his further growth. The teaching should be so shaped as to gain these ends. While you teach geology or physics or chemistry you are not only seeking to impart information but also trying to give your student an insight into laws and processes of Nature, and about ways of acquiring knowledge.

The ideal that the teacher and the taught are both partners in an exciting enterprise and are both votaries in the temple of learning must be translated into practice. This is your task and performance of this task would help a great deal in making you a true friend, philosopher and guide of the student.

*"By education I mean an all round drawing out of the best in child and man, body mind and spirit."*

—GANDHIJI.

## CHAPTER II

### AIMS

*"The aims of education depend upon the kinds of values regarded as most important for directing human development. One programme of education may rest upon the primacy of material values. Another may emphasise the aesthetic experience. For others, the realm of truth may be the key value. Social considerations are fundamental for some people while others may regard moral or religious values as the paramount concern of education."*

—PHILIP H. PHENIX

#### *General Aims:*

The objectives of university education are primarily the pursuit of learning and research without regard to immediate utility and the development of the personality of the student. In addition, we seek to train men and women for certain professions. It is, therefore, natural that the process and content of learning will be different for different kinds of education. Whatever may be the field of learning, the significance of each subject should be understood in relation to the general frame-work of the total curriculum and the place of the subject in the whole course of instruction.

As Dr. Karl Compton has observed "the ultimate value of undergraduate education depends far more on the quality of intellectual and moral discipline and inspiration than it does on the particular course of study which is the vehicle through which this discipline and inspiration are imparted." The purpose of the curriculum is to provide each student with learning experiences which would enable him to achieve the defined educational objective.

A great deal of thinking and planning must go into the teaching of each hour in the college. Hence you must plan in advance so that each item of the subject is properly related in terms of time and emphasis to the objectives of the entire subject. This would indicate that you should have a short-range objective related to hour-by-hour work in the college during each week-day of work, as well as a total perspective of the objectives of the subjects you teach as they are related to the whole curriculum of study.

The objectives of the subjects, related to the whole curriculum of study, are called general objectives and the objective of each item of the subject properly related in terms of the time and emphasis to the objectives of the entire subject is called specific objective. The general objectives are broadly termed as instructional objectives for they convey the intent of instruction and serve as a guide in planning for teaching and evaluation. As there are no direct means to find out whether a student possesses

knowledge or not, the results of learning are often measured in terms of pupil behaviour —mental, emotional, or physical. In the Taxonomy of Educational Objectives, Bloom had grouped mental, emotional and physical behaviour under the cognitive, affective and Psycho-motor domains in a hierarchical order.

Cognitive domain constitutes of those objectives which deal with intellectual skills and abilities, affective domain with changes in interest, attitude etc., and psycho-motor domain with changes in motor activities. The three domains are placed in a hierarchical order due to the fact that when learning takes place the student first undergoes a mental transformation trying to understand, analyse and synthesise the information received. Then the knowledge acquired begins to produce changes in his attitude, interests, and aptitude. Finally, the change in the interest, attitudes etc., result in a change in his physical behaviour and motor activities.

Each domain is further classified into sub-categories which are placed in an increasing order of difficulty. For specifying the instructional objectives, the cognitive domain is more useful. Hence, the classifications of the cognitive domain will be dealt with in detail.

### **Classifications in the cognitive domain of the Taxonomy**

The learning outcomes in the cognitive domain are given below in the hierarchical order along with necessary explanations.

#### **Knowledge**

This is the lowest category in the domain which calls for mere remembering and recall of basic facts, rules, principles etc. The questions requiring the students to define technical terms, match dates with historical events etc., will come under this category. Recall means bringing back to mind materials already absorbed. Recall may be either recognition-recall or volitional-recall. Recognition recall is inferior to the other kind of recall and denotes the remembering of a thing only when reminded of it. Multiple-choice items come under recognition-recall while, filling-in-the blanks of completion type come under volitional-recall. The vividness and speed of recall depend to a large extent on the period of contact with the material and the depth of the impression made by it on the mind. It is seen that reviews and repetitions tend to elevate recognition-recall to volitional-recall. Hence, the teacher should strive to enlarge the capacity of recall of the students by work so framed as to make them think over the matter presented.

#### **Comprehension**

Comprehension is the assimilation of ideas on a basis of clear understanding. In the absence of this step, the learning process cannot proceed. Comprehension includes interpreting learnt material, translating verbal material into equations or graphical form,

estimating consequences, interpolating and extrapolating the given information etc. New ideas can be comprehended only if a background or foundation of related knowledge is already present in the student and the new ideas form a logical corollary to such existing knowledge. In other words, the student must be led from the known to the unknown. Therefore, problems of terminology and vocabulary should be first dealt with before introducing the concepts. In organising class lectures and materials the teacher must keep in mind that true comprehension of difficult concepts and ideas require the undivided attention and concentration of the student. Therefore, the teacher must adopt methods calculated to catch and hold the attention of the students.

### **Application**

“Learning without thought is labour lost”, says Confucius. Knowledge and comprehension do not by themselves constitute the entire learning process. Learning, however, is complete only when the learner can use the knowledge in new situations to untangle new problems. Using concepts and principles already learnt in new situations, solving problems by the usage of correct method etc., come under application.

### **Analysis**

It is the mental activity of recognising the pattern, form, procedure or method used to communicate a subject matter rather than the subject matter itself. It also includes recognising of unstated assumptions, inter-relationships, logical fallacies in reasoning etc., by breaking the subject matter into smaller parts. Hence, analysis is a process which intends to clarify how a subject matter is organised, and the way in which it manages to convey its effects. Examples for analysis are given below.

1. Checking the consistency of hypothesis with the given information and assumptions.
2. Listing the variables and constants for a given set of problems.

### **Synthesis**

Synthesis is the ability to write a well organised theme integrating learning from various areas, ideas and statements originally. In other words, it is putting together elements and parts so as to form a whole. This involves arranging and combining parts in such a way as to constitute a pattern or structure which did not exist before. In simple words, it may involve the creative potential of individuals like the ability to plan, or organise and generalise instruction for a particular situation. Synthesis is involved in each of the situations given below.

1. Preparing a table of specifications for a test.

- 2. Writing an essay on some topic.
- 3. Trying out a new method to solve a problem.

### Evaluation

It is the ability to reflect upon the pros and cons, make judgements about value for a given purpose using definite criteria, evaluate the results of experiments to arrive at generalisations, note limitations to suggest remedial measures etc.

It may be seen that the learning outcomes are arranged in the order of increasing complexity. They begin with a relatively simple recall of factual information, go to the lowest level of understanding, i.e. comprehension and then proceed through the complex levels of application, analysis, synthesis and evaluation. Viewing the instructional objectives in terms of the above learning outcomes, it is important to bear in mind that we are concerned with the *products of learning* rather than with the *process of learning*. A few examples of instructional objectives will provide clarity in understanding what broad guidelines these provide.

- 1. Applies acquired knowledge of scientific principles to new situations.
- 2. Knows the common symbols used in mathematics.

But, for teaching and evaluation purposes, these broad guidelines do not help much. Hence, it becomes necessary to break down an instructional objective into a series of specific objectives. The specific objectives are short-ranged. It is made clear through some examples. The general objective, ‘applies acquired knowledge of scientific principles’ can be split into some short-range specific objectives like,

- 1. Identifies when the principle is to be used.
- 2. Sorts out problems where the principle is applicable.
- 3. Learns to solve numerical problems based on the principle.

One may list down a large number of specific objectives for an instructional objective. But, what we are interested in listing out these specific objectives is to draw a representative sample of specific objectives from the entire list so that once the students have achieved these specific objectives we can say that they have achieved the instructional objective. It may be made clear that it is not essential to include all the learning outcomes mentioned earlier in the general objectives of a course.

Like the general instructional objectives, the specific objectives also start with a verb. Here, however, the verbs are specific and indicate definite observable behaviour. If the pupils demonstrate the specific objectives we conclude that the instructional objectives have been achieved.

## **Preparation for Life**

To some, their education is a means for making a living and an aid to attain individual and social security. Some others come to the university with a view to increase their understanding of society and their place in it or perhaps, to increase their ability to make significant professional contribution. The kind of training, therefore, which we provide within the campus should be calculated to release the maximum of the creative potential in our students. The habit they acquire here should be an excellent preparation for their highest contribution in different professional fields in which they will find themselves later in life.

‘A subject is not the only medium of education. The teacher himself is another.’ You cannot teach without sharing your personality with your students - your attitudes, beliefs, standard of values, qualities of thought etc. Realising this truth you should try to make conscious use of yourself in instructions. Ethical, moral and aesthetic values are communicated better by people than by subject matter. It is for this reason we emphasise that education imparted by a good teacher is better than a self taught course.

We may perhaps consider that learning Shakespeare or Newton’s laws may have little direct professional value. But if we had steered along the right course with the right objectives before us, we would have produced men of whom we may be worthily proud, men who have learned how to acquire new knowledge on their own, evaluate it and use it creatively.

Some teach every detail with laborious elaborateness; what is much more important however, is that the manner in which the material is communicated should provide the student with a key that would unlock the treasures of more value when he seeks them by himself. We should “aim not to cover the subject, but to uncover part of it.”

*“The end of all education, all training, should be man-making. The end and aim of all training is to make the man grow. The training by which the current and expression of will are brought under control and become fruitful is called education.”*

—SWAMI VIVEKANANDA.

## CHAPTER III

### THE ART OF TEACHING—LECTURING

*“Let your reasoning be that of an intelligent man, but let your meaning be expressed in the language of the common people.”*

—ARISTOTLE

The common method of instruction at our Universities is the lecture. There is a certain art in lecturing and to become a successful teacher, you must learn it well. Hence it may serve you well, to learn a few techniques of the art of lecturing.

#### **Preparation and Planning**

Teaching needs a great deal of planning. It should be at once long-ranged and short-ranged, in the light of the accepted objectives of each subject, with an awareness and appreciation for the place which the subject occupies in the total curriculum. This would involve judicious selection which implies a judicious omission as well.

You should realise that the successful teacher is not the one who tries to tell everything that there is to be told. Exhausting the topic is not the criterion. Experienced teachers generally are able to sift the important from the unimportant, teach thoroughly the important facts which are basic to the understanding of the subject and refrain from making the students face too many details. When you have a text-book to follow, it does not mean that your teaching must necessarily be glued to it. Supplement the text-book with meaningful additions which would make the subject quite interesting. Some interesting anecdotes would add spice to your teaching.

It would be advantageous for you to make an advance outline of the subject you teach in as complete a manner as possible, by setting down the order of presentation of new material and likewise the order of presentation of each topic under that head. This order should be from the known to the unknown, from the simple to the complex and from the concrete to the abstract.

The preparation stage is of great importance if you want to become a successful teacher. Before each class begins you must be sure as to what exactly you are going to say in the class for the hour as well as the order in which you plan to say it. Thoroughness of preparation is a pre-requisite for successful teaching.

Prepare adequate notes and master them thoroughly so that a quick glance will give you the kind of help you need from these notes. In preparing for your class, plan your time also with imagination. Sometimes what is obvious to you may not be obvious to your students. So, it will be necessary for you to make allowance in advance for this when you plan your time schedule for the course. There are several teaching

aids which help to put across ideas - such as models, charts, maps, film-strips and other audio-visual aids which sometimes do a much better job of teaching than the unaided human voice. Before the term begins, start procuring all such teaching aids which you may require for your subject.

If you intend presenting to the class a demonstration, be sure you have tried it at least once in the class room by yourself and have succeeded.

### **Platform Shyness and Nervousness**

If you are new to the profession of teaching, you may feel a little nervous before your classes. This may be due to platform shyness or lack of confidence. It should comfort you to know that some of the best teachers have had similar experiences during their first classes. However, this will soon disappear. But one of the best ways of getting out of it very quickly is to be thoroughly prepared for the class. You should think of the students as partners and teammates in the teaching-learning process. This attitude would be very helpful to cast away platform shyness. Frequent meetings with the classes would help you to establish fellowship with your team-mates which should be cordial so that your students soon come to accept your rôle as a teacher.

### **Initial Gauging of the Student's Knowledge**

For effective lecturing you should have a thorough knowledge of the subject covered by the student in the previous term. Therefore one of the first things to be done during the term is to take a measure of the knowledge of the whole class in the subject you are going to deal with. This may be obtained through a short test designed to locate deficiencies, if any, in the equipment of the student. Pointed questions at random to a few students may also reveal the general standard of the class. Glaring deficiencies should be diagnosed this way and rectified through appropriate remedial methods.

### **Method of Lecturing**

The lecture should be delivered in simple language and your meaning should be clear. Be pleasant, sincere and co-operative. The sincerity of your interest in the subject would reveal itself in the manner in which you explain it, in your voice, in your eyes and in your gestures.

Present your subject in a manner that would stimulate eagerness for learning. Undivided attention must be obtained if the maximum benefit is to be derived by your students from your classes. Your enthusiasm for the subject would indicate itself to the student. But if you are not sufficiently interested, lack of interest becomes communicable.

### **a) Introduction to the Lecture**

It is a good practice to begin every lecture with a brief *resume* of the matter taught in the previous class which has a specific bearing on the new material you intend to teach. The student must be able to see the relationship between what he knows already and what he will learn in future. Your work should be graded to suit his need and to give him a sense of steady progress. There should be scope provided in each class for recall and repetition by the students to establish contact between what had gone before and what comes after. Pointed questions directed at random to a few students in the class often function as an effective pick-up.

### **b) Topical Heading**

It would be useful to announce the titles of each division and sub-division of your lecture.

### **c) Stress on Definitions and Fundamental Principles**

In the teaching of any subject, especially in science, definitions are important. You set specific limitations when you define a scientific term. A clear understanding of these is essential for all further understanding of the subject. A fundamental concept conveyed through a definition, if misunderstood in the beginning, would greatly handicap the students' understanding of the subject later. It is, therefore, essential to ensure that the students understand the pertinent technical vocabulary. At the same time do not confuse understanding and thought by much technical jargon. Use the proper word in the proper place; neither too much of it nor too little of it. You must make sure as you proceed with the new material for the hour that each student has acquired a good understanding of the precise meaning of specialised technical terms.

An important quality of your lecture should be good explanation. You may make use of suitable devices to make your exposition effective. You may use illustrations and comparisons to facilitate easy understanding of a difficult concept.

### **d) Repetition**

Repetition helps both understanding and recall. It is very difficult to expect all students to be completely attentive every minute of the hour. This apart, pre-occupation in taking down notes often prevents following all that you have said; and sometimes students miss a main point if it is not repeated. It does not mean that you should usually repeat the same idea in identical words. Repeat the thought in as many ways as you can. This would help to impress the thought in the mind of the student without making it tedious.

### e) Timing

Timing is an important technique of teaching. Time is necessary to take in what is taught. It is better, therefore, to ration out material. The conscientious teacher who desires to thrash each subject threadbare must realize that he is not out to pack the mind of his student but to fill it judiciously so that the student would be stimulated to go beyond the actual class material by doing self-initiated private study.

### f) Sustaining Students' Interest in the Lecture

Eloquence alone does not make for effective communication. Therefore you should keep your eye on the students throughout and see to what extent they are responding to your teaching. The lecture has to include questions to the students on points which are significant. You may also write important points on the blackboard. The method of lecturing has to change from one class to another, according to the intellectual equipment of the class. The main point is that the lecture should help the students to get a quick and firm grasp of the essentials of a subject and serve as a guide to profitable reading in it.

The best way of making your lecture effective is to punctuate it with variations of your voice. Pause between sections of your arguments. "Make it plain that you have finished a unit of thought. At times silence can be more emphatic than a shout. Vary the speed and force and incision of your speech to suit the material. It is not often effective to assume any manner of speaking that is artificially sweet or impressive even for a short period; but your voice should change within a lecture, at least as much as it does in private life where it varies all the way from the energetic rapidity of an argument with your friends, to the careful precision of the statement to your lawyer or doctor. No one would find it interesting to talk to a man who never raised or lowered his voice, never changed the speed of his words, and showed no change of feeling in his eyes and expression. No one finds it interesting to listen to a lecture delivered with the same monotony. Expressiveness in speech is natural. Repression and dullness in speech are artificial."

### g) Modernizing Your Notes and Techniques of Teaching

Generally you may be required to teach the same subject that you were teaching for several years. Merely repetition of notes prepared by you perhaps years ago, becomes colourless and sometimes reflects total lack of originality of thinking. Look for new ways of doing these things. In a changing world teachers should not stagnate. Presentation of a subject can be improved every time it is taught. This can be done if you objectively criticise yourself. One of the surest ways of doing this, is to write out your own comments on how far each class has succeeded or failed on the margin of your notes. This would help you to seek new ways of improving your class each year. Keep your mind flexible about the techniques you wish to adopt in teaching the classes. Use a

variety of techniques in teaching like lecture, recitation, discussion, demonstration and other devices as time and circumstances would permit. Do not allow yourself to be stereotyped.

#### **b) Liberalization in Technical courses**

Most teachers of technical subjects are agreed that a liberalizing influence is absent in technical education to-day.

True liberalization is the leading of a student to wide knowledge of things outside the narrow range of his technical subjects, an insight into matters outside the specialist studies. A great deal may be achieved in this direction by teaching technical subjects in a different manner. Instead of a purely technical introduction to technical subjects such as Applied Mechanics and Strength of Materials, you may adopt the better approach of offering a historical perspective on the scientists who contributed to these branches, their life, work and times, their spirit and achievements, on the growth and development of the subject and on the impact of it on the life of the society. Apart from adding interest to a purely technical subject, it makes the student conscious of the human background, gives him an historical awareness and a realization of the wider issues of science.

#### **i) Discipline in the Class**

It is essential that you should maintain good discipline in the class. Sometimes you may come across students who make a nuisance of themselves by asking irrelevant questions or by being inattentive. It would, therefore, be necessary for you to find why these students behave in the manner that they do. It is probable that the matter you are presenting may not be challenging enough to keep their minds completely occupied or that you have not succeeded in being properly understood.

#### **j) Individual Attention to the Student**

Level your attention and your planning at the individual student and not at the class in a vague, general, impersonal way. The class is made up of individual students. Each student should matter to you as an individual. Perhaps you may not be able to meet them individually; you and possibly your students too, may not have the time or the leisure for this purpose. Yet, you should be able to deal with the class in a manner that creates the feeling that you have got each of the students involved in the learning process through your teaching. To do this effectively you must be aware of the needs of each individual. There is generally a common factor in the needs of all the students. While addressing yourself to this common factor generally, you should at the same time be meeting the needs of the individuals in the whole class.

### **k) Kindling Initiative and Creative Thinking in the Student**

Your teaching should be aimed at inculcating in the student initiative, creative thinking and a healthy inquisitiveness coupled with humility. To quote Mahatma Gandhi, "Persistent questioning and healthy inquisitiveness are the first requisite for acquiring learning of any kind. Inquisitiveness should be tempered by humility and respectful regard for the teacher. It must not degenerate into impudence. The latter is the enemy of the receptivity of mind. There can be no knowledge without humility and the will to learn."

Students must be helped in the art of using textbooks and reference material. Generally we do not spend time on these two important aspects of teaching. Guiding a student to find out for himself the material that he needs from a library for a fuller understanding of the subject is an important aspect of the teaching work. Very few students nowadays know how to use reference material. The reading habit must be cultivated on the right lines.

Frame questions that would stimulate interest and provoke the student to think. Present him with challenges which he would be encouraged to solve satisfactorily by self-initiated study and reference. You should not smother the student with the right answer the moment he begins to ask for it. Let him struggle along and make mistakes. Do not be too eager to help him with the right answer. If you do so, in place of helping him, you may in fact be hindering his mental growth and denying him the chance to think.

### **l) Showmanship**

A histrionic representation has high value as a teaching method. A teacher who has to depend mostly on his voice would do well to supplement it with gestures. Learn to make an eloquent use of your hand and face. But take care that it does not become ludicrous.

### **m) Pronunciation**

In our colleges, teaching is mostly done through the medium of English. It must be remembered that the meaningfulness and clarity of spoken English depend greatly on faultless pronunciation. You must know to lay the accent on the right syllable. To talk English as you would talk your own mother tongue would be to spoil the whole effect of your class. Right pronunciation is an asset to any teacher.

### **n) Encouraging Discussion and Inviting Questions**

A lecture should not be presented in one continuous discourse. A long lecture strains the capacity for concentrated listening. It will be difficult to maintain continuity

in thought. A lecture may be organised in several units. As soon as one unit is completed it may be followed by questioning or discussion for a few minutes.

Even where the teacher feels that he has been proceeding logically and step by step in building up his lecture, it is quite possible that the student might have missed the obvious, or been puzzled over a link and thus lost hold of the thread of continuity. Serious gaps may thus occur in his understanding and it is the teacher's responsibility to unearth these gaps and untangle the puzzles before proceeding too far.

In order to do this the teacher should not only ask short questions calculated to gauge student-understanding but should also encourage students to voice their doubts and get them clarified as and when doubts arise. Many students tend to keep their doubts to themselves due to shyness or inferiority feelings. This sort of feeling must be discouraged and in this the teacher can play an important role.

Before you begin a lecture, invite questions and doubts on the topics discussed in the previous class. Reveal the answers through logical discussion and not directly. While lecturing, omit some explanations deliberately and give room for doubts. Do not turn down even simple questions. Before you suggest an answer to anyone's question give an opportunity to the other students to answer. This may bring up worthwhile discussion.

*"The function of the teacher is indeed an affair of the transference of something and not one of mere stimulation of existing intellectual or other faculties in the taught. Something real and appreciable as an influence comes from the teacher and goes to the taught."*

—SWAMI VIVEKANANDA.

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## CHAPTER IV

### THE ART OF TEACHING—OTHER METHODS

*"A surgeon or physician is trained by watching masters of art at work and learns from their excellence something unforgettable, not to be learned from lectures or books. In a school of architecture or painting the pupil is shown in reproduction or otherwise the masterpieces of the art. The same principle holds for the teaching of engineering. Of every occupation whether professional or technical the learner is or should be brought in touch with the best practice of his art or trade so that he has a standard to judge by, a mark at which to aim. In everything we think it is essential to know the best however much we may come short of it."*

—RICHARD LIVINGSTONE

As referred to earlier, lecturing remains the most common method of teaching, but if teaching is to be effective, the lecture must be supplemented by regular written exercises, tutorials, colloquia, seminars and laboratory work.

#### Written Exercises

It is necessary to emphasize that throughout the course you must expect some written work of every student periodically, preferably once a week or fortnight. This is well emphasized in the University Education Committee's Report. "The average student in our University brings with him the school attitude towards his studies. He expects to be treated like a school boy ever in the University. He does not realize that it is his duty to study and not the teacher's duty to make him study."

"He does not make full use of the opportunities the University offers him and, therefore, does not get proper advantage from the University. Unless he himself works and does a good deal of written work for his teachers to correct, he cannot get benefit out of his teachers. This attitude on the part of the students leads to another noticeable defect i.e. the very slow rate of progress of work in the classes. In British and American Universities the rate of progress of work in a class is ever so much faster than in an Indian University with the inevitable result that they are able to cover a much larger ground in the same period of time and the contents of their syllabuses are fuller and richer."

It is a teacher's task to plan and prepare the home work for the students well in advance. The assignment for home work should carry the principles taught during the week and offer scope for review of what had been done earlier. Some of the common principles underlying a number of problems on the same topic should be well drilled

through these assignments. It is important that in giving assignments the teacher should remember the claims of all his colleagues in this matter. If this is not kept in mind, the claim on the time of the student by any one teacher may be totally out of proportion to the relative importance his subject carries in the curriculum. "Spot the mistake" type of problem is useful to develop a critical approach in the student. In the earlier stages the student is presented with a drawing or statement containing several mistakes, some gross and others subtle and required to identify these mistakes and give a corrected version. It is important that the student must do a correct version, for that is the image he will retain. The analytical approach used here will be carried forward to his original work later on.

It is a good practice to write out the assignments on the board or give them in the form of typed sheets. A dictated assignment may defeat the purpose of the assignment particularly since there is a risk of some students taking it down wrongly. When giving an assignment keep in your mind an estimate of the normal time required for completing it.

### **Tutorials and Colloquia**

In tutorial instructions, the student comes to you at least once a week for private or personal advice and instructions. In an intimate way you are required to direct and develop the thought process which must always be an activity of the student himself. The learner discovers how to analyse, judge and evaluate, while the tutor leads and criticizes as the pupil tries his own wings and pursues his intellectual flights.

In the colloquium you meet a small group of students for informal discussion on special topics or subjects. Tutorials and colloquia are well suited to the students of both sciences and humanities. In the Arts subjects it can take the form of a talk while in the Sciences, it can take the form of answers to a few questions or problems. The object of tutorials is to achieve effective supervision of the individual student's work and progress. The student should not only acquire factual information and develop the habit of independent thinking, but should also learn to present his ideas accurately in correct language and in an orderly manner. In a small group an enterprising student will sharpen his wits through discussion and profit by the mistakes of others as well as his own.'

The teacher has to bear in mind that the tutorials is not an attempt to 'spoonfeed' or coach students in the art of 'passing the examinations.' You are not merely teaching a subject 'but are educating men and women to take their places as intelligent and responsible citizens of the nation.'

### **Seminars**

Seminars are usually used as a teaching aid for the Post-graduate and research students. In a seminar a group of students with mature minds working on the same subject engages in a joint discussion. 'The technique involves the launching of a thesis

of a penetrating and provocative character upon which all members of a group have opportunity to express themselves freely around a table. The objectives are to stimulate discussion, clarify issues and arrive at the truth through a co-operative approach.'

### Laboratory Work

Laboratory work intelligently planned and performed is the means par excellence for developing the intellect and the qualities of independent action and leadership in a student. Usually in laboratories the student works with realistic types of equipment. He should have an understanding of the theory involved, of the principles of operation of the data which could be taken, of the relative importance of the variables, of what, "readings" must be taken and what degree of accuracy each reading requires. Frequently a specific procedure has to be followed, several readings must be recorded and certain preparations should be completed before starting the experiment, like the calibration of measuring instruments etc. The student must have adequate knowledge of all this.

Laboratory work must be planned very carefully. The type of work planned and instructions given to the junior students should be different from those given to senior students. First and second year students in the University should pay greater attention to details in a scientific way and it is for you to show the student the relevance of what he does in the laboratory to the whole course that he learns in the class room. Laboratory courses should be so arranged as to enable the students to have their doubts cleared as they carry out the experiments and the teachers should impress upon them the general principles that underlie these experiments.

For the senior students the laboratory work should be organised so as to give them a chance to develop their initiative, independent thinking and leadership qualities. You should decide about the number and type of experiments to be carried out and prepare a systematic schedule before the starting of the first term. It is suggested that the students may be divided into groups preferably with not more than 4 in a group. One member of the group may be made the "leader" for a particular experiment and the others in turn for other experiments. A copy of the schedule is to be given to each student so that he could know well in advance when he is to serve as leader. The leader should be expected to assume the major responsibilities of organization and collection of material, of preparing the procedures, the theoretical background, objectives and instructions for the experiment, and of operation, calculation and report-writing. He should make full use of the library in preparing for the experiment. The leader should be required to assign each member of the team specific duties.

You should check the instructions and procedures prepared by the student and if they are not correct, you should indicate the correct procedure before the experiment is performed. You should act as a guide in the preparation and performance of the experiment.

## **Other Aids**

In teaching you may appeal to as many senses as possible. As the lecture method often becomes monotonous because it appeals only to the ear, other senses also should as far as possible be stimulated. The most common teaching aids are as follows:

### **a) Actual Objects**

Wherever possible you may show the students the actual objects, structures or mechanisms which you are dealing with. Actual contact with any object has a much greater value than mere description of it in words. Study tours and visits are of value in this connection.

### **b) Models**

Models serve a very useful purpose in the educational process, when the actual objects are either too big to be brought to the class or they are inaccessible. Models need not always be of a smaller size than the actual objects; they can be of a larger size when intricate details have to be shown. They often simplify the study of complex mechanisms.

### **c) Illustrations**

Stills and slides are well suited for showing of subjects where motion is absent or not of a major importance.

Some precautions are necessary while showing these illustrations. The showing of stills should not be allowed to drag; at the same time there should be sufficient time to make notes or listen to the teacher's comments. Careful selection is also necessary. The subject matter should not be too simple or too hard and in any case should not be introduced before the student is ready to profit from it.

### **d) Class Room**

The physical environment provided for learning should be satisfactory. Students ought to be comfortably seated in a well ventilated and lighted place if the processes of learning and teaching are to be pleasant. Therefore, you would do well to inspect the classroom before the term begins and if any alteration is needed for more effective teaching, it would be better to get this done earlier rather than during the middle of the term. Carefully examine whether the blackboard is clearly visible from all parts of the class-room. Test and satisfy yourself that your own handwriting on the blackboard can be read by you wherever you sit in the classroom.

### e) Black-board

The black-board perhaps is the teaching aid that is most frequently used, particularly while teaching subjects which are allied to Mathematics. It would be helpful to know how best to use it in order to derive the greatest advantage from it. It is the visual counterpart of the human voice.

(i) Plan in advance what you intend to write, the order in which you intend writing it as well as the place where you want to write.

(ii) Use a chalk which is sufficiently soft so that when you bear down on it hard enough, you produce lines which could be seen plainly from any part of the room. If the chalk tends to squeak, hold it at a sharp angle with the black-board.

(iii) Write in large hand so that what is written may be clearly read from any part of the room. Letters whose height is about 0.5% of the depth of the room may be considered adequate. Generally letters 5 to 8 cm. high would be sufficient in the smaller class rooms and they should be proportionately increased according to the size of the class.

(iv) Look to the lighting arrangement carefully so that the black-board is free from glare. When this cannot be secured, locate the area on the black-board which is free from glare. Take care to limit your writing within that area on the blackboard. Indiscriminate use of colour chalks should be avoided. For, students do not generally have a comparable supply of colour pencils. When a white chalk could satisfactorily serve the purpose limit your use to that chalk only. But when you do not expect the students to copy the diagram, colour chalks may be freely used.

(v) Be sure that your writing on the board is neat and legible. Do not scribble. If abbreviations are used they should be such as are commonly accepted and are free from ambiguity. Never use an abbreviation to cover up spelling deficiency.

(vi) Talk to the students, not to the black-board.

(vii) When writing on the black-board, take care not to let your body come in between what you write and the students. In this the left handers have some advantage over right handers who may have to adopt a suitable practice for this purpose.

Where two black-boards have been arranged one behind the other, so that one of these could be sent up, begin by writing on the outer or the front board. When it is filled, send it up and continue on the inner or the back black-board. This would help you to have the whole sequence of your writing presented in the most orderly way.

*“The true teacher is he who can immediately come down to the level of the student, and transfer his soul to the student’s soul and see through and understand through his mind. Such a teacher can really teach and none else.”*

—SWAMI VIVEKANANDA

## CHAPTER V

### EVALUATION

*"Examinations are not a sudden doomsday visitation, but the natural fruition and fulfilment of a long period of educational preparation and growth."*

—REPORT OF THE COMMITTEE ON THE INDIAN EXAMINATIONS REFORM PROJECT

Examination, evaluation and grading are integral parts of the total educational process. It is essential that, during and after a course of study, both the teacher and the taught should be able to evaluate how far they have progressed towards the attainment of the objectives of instruction imparted. Evaluation provides a measure to assess the success and failure of teachers as well as students. It can mirror faithfully the strength and weakness of different teaching methods and can lead to critical review and constant improvement of our courses of study. Evaluation should be a continuous activity which should be designed simultaneously with curricular development. The faculty should be dynamic and willing to change teaching methods as a result of evaluation.

Evaluation offers evidence regarding the standard of student's achievements and attainments on a scale relative to that of the class. Such an evaluation enables us to measure the day-to-day progress of the students through a carefully planned scheme of tests and examinations.

Examination is an observation on the progress of the student and the instructor as a team. The principal objectives of the examination are: (1) to evaluate the level of each individual student's attainments and compare them with those of his classmates and (2) to evaluate the effectiveness of different teaching methods.

#### Evaluation—The Present System

Almost any examination measures something; but what that something is, is not always obvious. This is the case with our system of University Examinations. Dr. Radhakrishnan's Report of the University Education Commission says, "For nearly half a century, examinations, as they have been functioning, have been recognized as one of the worst features of Indian Education.....If examinations are necessary, a thorough reform of these is still more necessary."

There are many factors that influence the outcome of the examination such as the framers of the syllabus, the teacher, the student, the question paper-setter and the Board of Examiners. The syllabus is framed by a panel of experts with some set objectives. The instructor teaches the subject interpreting the syllabus not without a touch of his own individuality. Some other person sets the question papers on the same syllabus,

laying stress on some of the topics. The examiner evaluates the answers looking for some points which he considers important. In this process, sometimes, the main objective with which the syllabus has been set forth may be lost. Further, proper evaluation becomes difficult due to the scope for choice in the question paper which encourages the student to neglect certain topics and still get through his examination with distinction.

An effective examination system must obviate fluctuations due to systemic defects, eschew the element of chance and enable the objective evaluation of the students' standard of attainment and ability to use the knowledge he has acquired. These characteristics cannot be measured by one examination or one type of examination. A series of tests and examinations are essential to enable the proper assessment of the student's achievement in learning and minimise the influence of factors irrelevant to a fair evaluation. In other words, a continuous evaluation of the development and knowledge of the students is necessary. This assessment provides a gradual build up of cumulative judgement about the performance of students over a period of time. As this process of evaluation is continuous and the students are assessed by their teachers it is called continuous internal assessment. The advantages of introducing this system of continuous internal assessment are as follows:

1. The evaluation is done by the teacher who teaches the course. And he is the right person to evaluate for he knows his students best.
2. The teacher is given the freedom to test the variety of learning outcomes according to his choice. Hence, a wide range of objectives could be covered unlike in the end examination.
3. Continuous internal assessment could be used as a diagnostic aid to locate students' learning difficulties. The teacher could suggest suitable remedial measures for the students' improvement.
4. The feed back received from the students could be utilised by the teacher to modify his instructional methods to suit his students.
5. Since this assessment is done periodically it helps the students also to know their strengths and weaknesses and thereby contributes to effective learning. It could be seen that while external examinations aim at maintaining standards, continuous internal assessment aims at fostering individual abilities of students. Continuous internal assessment forms an integral part of the educational system and helps in both teaching and learning situation. For the purpose of final classification of students the marks-grade obtained by them in both continuous internal assessment and University examination should be added with proper weightages allotted to them.

Broadly speaking, there are two types of tests—the essay type and the objective type. The essay type questions are principally useful in humanities, arts and descriptive subjects where opinion, organisation of material and forcefulness of

expression are to be tested. These tests are not free from defects. Subjectivity and the consequent lack of precision in marking are some of them. Objective tests are those in which subjective opinion of the examiner is minimised. Hence in professional examinations more objective tests are employed. These tests should have the following characteristics: (1) They should be valid i.e. they must really test what they set out to test (2) they should be reliable, i.e. the results of evaluation should be substantially the same even when tests are given again and again to students of similar achievement. (3) They should be adequate i.e. the test must be set up to measure satisfactorily the student's attainment of each one of the objectives of the course. (4) They should be as far as possible objective i.e. the personal bias or opinion of the examiner on the subject matter must be eliminated.

It is desirable to conduct a series of tests periodically in each subject. Considerable amount of time and thought must be devoted to devise the tests so that they will be appropriate for the specific purpose i.e. to measure what is to be measured. Before the items-questions for a test are collected, the teacher should first plan what learning outcomes he wishes to test and the content material to be tested. The teacher may include some or all learning outcomes as per his choice. The learning outcomes could be related to the content area through a table called the table of specifications which is illustrated below for a paper having three units.

**Table of specifications**

Outcome Content	Knowledge	Compre-hension	Appli-cation	Analysis	Synthesis	Evaluation	Total
Unit I	5	2	3	5	1	—	16
Unit II	—	4	4	6	2	—	16
Unit III	6	1	1	2	5	5	20
Total	11	7	8	13	8	5	52

The entries in the boxes may be the number of questions or the marks allotted for the learning outcomes in a particular unit. The rows in the table represent the number of questions/marks allotted for the various learning outcomes in a particular unit. The entries in the columns represent the number of questions/marks allotted for a particular

learning outcome in the various units mentioned. Each entry in the last row gives the total number of questions/marks allotted for each learning outcome and each entry in the last column gives the total number of questions/marks allotted for each unit. The entry made in the last column of the last row gives the total number of questions asked in the question paper or the maximum marks allotted to the whole paper as the case may be.

The advantage of a table of specifications is that it enables the teacher to have a clear perspective of a Unit and the specific behavioural change he hopes to bring about through it. This gives him a precise picture to enable him to do a more efficient job of teaching and testing.

Some of the tools the teacher may employ for evaluating his students' performances are tests, assignments, seminars etc. Practicals, laboratory work, project work etc., could also be used to assess science students. In the case of languages, tools like composition, translation, comprehension could be made use of. A few of the tools are discussed below.

## Tests

Tests may be conducted at intervals best decided by the teacher. Such tests may include short questions demanding pointed answers and problems to be solved. This kind of test will be appreciated by students as being fair in its adequate coverage of assigned topics without going into petty details. Such a test can be made as difficult as one chooses to make it. The test could contain the following types of questions.

1. True-false
2. Multiple choice
3. Matching of scrambled pairs
4. Completion of statement
5. Filling-in-the-blanks

In true-false type and multiple choice type of tests, guessing can be discouraged by giving negative marks to wrong answers.

It is desirable that these tests be so set that the degree of difficulty varies from test to test in more general terms. If tests were all easy, students tend to take things easy while on the other hand, if all tests were hard, they might lose self-confidence. Intelligent variation of the degree of difficulty of tests would help to keep the student always on his toes without discouraging him. In these class tests, the teacher has ample chance to notice how an individual student performs in normal and difficult situations. More-

over, if the teacher analyses his tests item by item he can improve upon some of them. He can check after each test how an item has behaved. He could find the difficulty and discrimination indices of each item. To find these two values, the teacher may rank the students in the order of the marks scored. The first one third of the students who score the highest marks and the last one third who score the lowest marks may be formed as upper and lower groups respectively. The ratio of the total number of students (from both the upper and the lower group) who get the item right to the total number of students in both the groups gives the difficulty index. The difficulty index is expressed as a percentage. For getting the discrimination index, the number in the lower group who got the item right are subtracted from the number in the upper group who got it right and this is divided by the number in either group. The analysis being done itemwise is termed as item analysis. This also helps a teacher to check ambiguity in questioning. The discrimination index will range from -1 to +1.

### **Assignments**

Evaluation of students need not be done through tests alone, but assignments could supplement them. Higher order abilities like analysis, synthesis could be evaluated better through assignments than tests. The teacher could look for the depth of students' understanding, the capacity to find inter-relationships between subject matter, the ability to transfer knowledge learnt in one situation to another suitably, the ability to apply acquired knowledge in real life situations etc. To carry out the assessment of assignments objectively the teacher could fix suitable heads of assessment with weightages. To avoid the students from copying from one another, the teacher could prepare a list of topics well ahead and ask the students to select a topic each. Topics, part of chapters etc., which could be done with minimum help may be given for assignment or students may be asked to refer books and write assignments to supplement the knowledge they have acquired in their classes. These assignments may be discussed in the class with an aim to improve learning.

### **Seminar**

Seminars may be conducted for students at under-graduate and post-graduate levels. Seminars involve the discussion of a topic/problem by the students under the guidance of a teacher or a group of them. While planning for seminars, it is necessary to provide situations which call for individual student's assessment. In other words, a topic or problem may be assigned to each of the students. If not, a topic may be allotted to a group, from which the students select different aspects for discussion. Students should be asked to write the material required for the seminar. Assessments for individual students should be made based on the written material and the student's ability to reason out his arguments during discussion. Topics similar to those mentioned for assignments may be included for seminars.

### **Terminal Examination and Final Examination**

Terminal examinations are of three hours duration conducted by the institution at the end of each term during the academic year. The final examination is also of three

hours duration conducted either by the institution or by the University at the end of the course or the academic year. The questions for these examinations should be so designed as to determine not only the depth of the student's understanding but also his ability to apply his knowledge.

A proper balance must be struck between theory questions and problem questions. Every examination has to be essentially a spot sampling of the entire contents of the course. The examination must be such that a regular and average student gets at least a passing grade.

These examinations may either be of the open-book or the closed-book type. The open-book examination has the advantage of bringing out the student's ability to find solutions to practical problems. Such open-book examinations are especially suitable for senior students of professional courses and are being widely practised in Western Universities.

In valuing the answer books each problem should be assigned a maximum mark in proportion to its importance. Arithmetical errors in the solution of a problem should be treated alike regardless of where they occur. Some instructors mark the solution of a problem wrong from the point where an arithmetical error occurs and do not check the entire solution to see if the remaining steps and procedure are correct. Students are working under the pressure of shortage of time during the test. Marks should not be reduced heavily for slight arithmetical error. In home assignments, however, where students have time to check their work, marks may be reduced heavily for such an error.

Theory questions require the students to describe, explain, compare or criticize. These call for organization of thoughts and ability to express them in words. The instructor can assess the answers to such questions by listing the points of an acceptable answer and comparing them with the answers given by the students.

The following points have to be considered while evaluating the performance in a practical examination in the laboratory or workshop:

1. Adequate preparation in the theoretical background for carrying out the particular experiment
2. Selection of proper equipments
3. Organization of the work and collection of data
4. Technique of analysing the data
5. Presentation of report

## CHAPTER VI

### GRADING

Grade means degree in rank or of merit. Grading is the process by which the students of a class are classified into different groups according to their attainments. The functional value of grading is in motivating the student to work towards improvement and progress. Traditionally students have been graded quantitatively on a 101-point scale ranging from 0 to 100 and grouped as I, II, III Class or failures. These classes/divisions are based on the ranges of marks allotted to them. This system has the following defects.

- i) A difference of one mark may affect the class/division obtained by the students.
- ii) As the ranges for each class/division varies from one University to another it becomes difficult to compare students of different Universities.
- iii) Even within one University the ranges for discrimination remain the same irrespective of the subject opted. It is often seen that in humanities and languages the full 101-point scale is not used by examiners. Hence, students prefer science subjects where they can score more, to humanities.
- iv) Often a common error is committed by assuming the ‘raw marks’ given to scripts as absolute values. This is not true, for a subjective element like achievement of students cannot be accurately measured quantitatively.
- v) Again, for arriving at the aggregate, the raw marks of different subjects are added. This is considered as one of the drawbacks of the marking system, as even though equal weightage would have been provided in the syllabus for different subjects it is not realised. This is due to the fact that when the marks of a subject with higher spread (of marks) is added to that of a different subject with lower spread (of marks) the former gets a higher weightage (more than the intended weightage) than the latter.

A good system of grading takes into account not only the performance of the student in the final examination but also his day-to-day work. Suitable weightages should however be given to the various evaluation measures such as Home assignments, Class tests, Terminal examinations and Final examination.

Methods of Grading on the basis of marks scored in internal assessment and external examination:

## Notations

$E$  = percentage of marks obtained by a student in the external (university) examination

$S$  = percentage of marks obtained by a student in the sessional work

$\bar{E}$  = arithmetic average of  $E$  of a set of students in the same examination

$\bar{S}$  = arithmetic average of  $S$  of a set of students in the same examination

$\sigma_E$  = standard deviation of the sample  $E$

$\sigma_S$  = standard deviation of the sample  $S$

$S'' S_R$  = modified sessional marks of a candidate

$n$  = the population of the sample

$w$  = weighting factor

$r$  = relative accuracy factor

$c$  = correlation coefficient

$a, b, l, m$  = dependent coefficients

$M$  = combined percentage of marks of sessional and internal as evaluated by the various methods

$\bar{M}$  = average of  $M$  of a population

$\sigma_m$  = standard deviation of  $M$  of a population

$\rho$  = band width for grading

Many educationists have been giving considerable thought to find an effective way of combining the attainment of students evidenced by the internal and external assessments. Grading a student by taking the arithmetic mean of the marks in the final examination and sessional assessment is not necessarily more accurate than the examination marks alone. The accuracy depends on the relative reliability of the two

results which are combined and on the relative weight assigned to each. Any adhoc weight to the sessional marks, as is done in many Indian universities at present, may be fallacious.

Several methods have been suggested below to combine the university examination marks with the sessional marks awarded by the college. Most of these methods assume that the external and internal assessments measure the same characteristic of the student. It is for the educationists to evolve the best of the following suggested methods in assessing the attainment of the students.

### 1. Taylor's method

In this method, a certain proportion of the sessional marks is added on to the examination marks. This proportion is called the weighting factor and is decided on the basis of two external and two internal evaluations in a year and their relative accuracy after these marks are scaled to have the same mean and standard deviation.

For a given set of candidates, the two sets of marks ( $E$  and  $S$ ) may have the same maximum. They will usually show a difference of scale. They will usually have different means and different standard deviations. The following steps are involved.

- i) Find the arithmetic mean and the standard deviation for all the students for  $E$  and  $S$  separately.
- ii) The marks are to be scaled to the same mean and standard deviation. Let the new marks of internal assessment be  $S''$  after scaling to the same mean and standard deviation to that of the university examination marks.

$$S'' = (a + bS)$$

where

$$a = \bar{E} - \frac{\sigma_E}{\sigma_S} S \quad b = \frac{\sigma_E}{\sigma_S}$$

- iii) Now we have a set of  $E$  and  $S''$  which represent the university and internal assessment results.
- iv) Assume a second set of marks  $E$  and  $S$  are available for the same candidates in the same subjects. This may be obtained if we have two examinations in a year and the overall internal assessment made twice a year for each candidate.
- v) Following the steps (i) and (ii) we can obtain another set of  $E$  and  $S''$ . Let the first set be  $E_1, S_1''$  and the second set be  $E_2, S_2''$ .
- vi) We have to find the relative accuracy,  $r$ , in the examination marking and the internal assessment.

$$r = \frac{b}{a}$$

where  $b = \sqrt{\frac{1}{n} \sum \left[ \frac{2(S'_1 - S''_2)}{S'_1 + S''_2} \right]^2}$  and  $a = \sqrt{\frac{1}{n} \sum \left[ \frac{2(E_1 - E_2)}{E_1 + E_2} \right]^2}$

vii) The weighting factor,  $w$ , is found from the relation

$$w = \frac{1}{r^2}$$

viii) The final marks,  $M$ , to be awarded to the candidate is

$$M = \frac{E + wS}{1 + w}$$

ix) The above method of assigning weightage,  $w$ , makes the combined result to be very accurate. The uncertainty of the combined result ( $E + S$ ) in terms of the uncertainty of the examination mark is minimum when

$$w = \frac{1}{r^2}$$

## 2. Correlation coefficient method

This method also requires the determination of mean and standard deviation for the given sample to find a correlation coefficient. Based on this coefficient, proportionate weightages are given for both sessional and external marks. The sum of the proportions is unity. This method fails when any one of the assessments does not follow a fairly normal distribution pattern.

i) The final combined marks  $M$  is expressed in the form

$$M = lE + mS$$

where

$$l + m = 1$$

ii)  $l$  and  $m$  are determined from the following relationship.

$$l = \frac{\sigma_E^2 - c\sigma_E\sigma_S}{\sigma_E^2 + \sigma_S^2 - 2c\sigma_E\sigma_S} \quad m = \frac{\sigma_E^2 - c\sigma_E\sigma_S}{\sigma_E^2 + \sigma_S^2 - 2c\sigma_E\sigma_S}$$

$$c = \frac{\left( \frac{1}{n} \sum E_i S_j \right) - \bar{E} \bar{S}}{\sigma_E \sigma_S}$$

Once the values of  $l$  and  $m$  are determined the combined marks can be computed easily as given in step (i). In this method also, the probable error of the combined marks is as small as possible. The standard deviation of the combined marks is a minimum.

### 3. Optimum weightage with ‘scaled sessional’ method

This is essentially a combination of the above two methods. The sessional marks are scaled to the same mean and standard deviation of the university examination marks of each college. Then the arithmetic mean of the scaled sessional and examination marks gives the combined marks of a student.

- i) The sessional marks are to be scaled to the same mean and standard deviation. Let the new marks of internal assessment be  $S'$  after scaling to the same mean and standard deviation to that of the university examination marks.

$$S' = a + bS \quad \text{where} \quad a = \bar{E} - \frac{\sigma_E}{\sigma_S} \bar{S}$$

$$b = \frac{\sigma_E}{\sigma_S} \quad i.e., \quad S' = \bar{E} + \frac{\sigma_E}{\sigma_S} (S - \bar{S})$$

- ii) The total marks obtained by the candidate

$$M = \frac{E + S'}{2}$$

This is an optimum combination.

- iii) Repeat the steps (i) and (ii) for each college separately. We will have a set of  $M$ .

The above three methods involve cumbersome mathematical manipulations of numbers to determine the combined marks.

#### **4. Harmonic mean method**

The combined marks are obtained by finding the harmonic mean of the sessional and university marks. This method does not assume that the two results measure the same characteristic of a student. The method is simple to adopt; but it penalises the student heavily if there is a large difference between his university and sessional marks. If there is proper safeguard for a reliable and sincere evaluation of sessional marks this would be a good method.

The harmonic mean of the marks obtained at the university examination and internal assessment is taken.

$$M = \frac{2 E S}{E + S}$$

#### **5. ‘Revised sessional’ method**

This method involves the determination of arithmetic mean of the university marks and the revised sessional marks. The revising factor is the ratio of the averages of the university to sessional marks of a college. Squaring the ratio would improve the reliability of this method. This makes an assumption that the internal assessment is likely to be biased.

Revised sessional mark,  $S_R = \frac{\bar{E}}{\bar{S}} S$  or  $\left(\frac{\bar{E}}{\bar{S}}\right)^2 S$

The combined marks  $M$  is given by

$$M = \frac{S_R + E}{2}$$

#### **6. ‘Weighted mean’ method**

This is essentially an improvement over the revised sessional method and adopts the technique of the second method without resorting to complex statistical methods. The weighting factors are determined as the ratios of the examination or sessional average to the sum of the examination and sessional averages. The optimum combination would naturally occur when these averages are equal.

The combined marks,  $M = \frac{E \bar{S} + S \bar{E}}{\bar{E} + \bar{S}}$

Also,  $M = l E + m S$  where  $l = \frac{\bar{S}}{\bar{E} + \bar{S}}$  and  $m = \frac{\bar{E}}{\bar{E} + \bar{S}}$

The last three methods are simple to adopt. The choice of a particular method should be made on grounds of simplicity and reliability. The following factors should be borne in mind in choosing a good method:

- a) It should be simple so that it can easily be adopted.
- b) It should provide due weightage to both the university and sessional assessments.
- c) The combined marks should follow a fairly normal distribution pattern.

All the above methods are found to satisfy these requirements in most of the sample surveys made.

### **Grading**

It is not desirable to set any rational minimum percentage for passing, in terms of subject matter alone. Therefore, relative grading becomes the only reliable method of measurement of students attainments. The attainment of the student is compared with those of his classmates. One way of doing it is through recognised statistical procedures by determining the mean and standard deviation of the combined marks of all the candidates of the different colleges. A simpler method of assigning grades is the 'class average' method. The class average is made the midpoint of the average grade. The mark interval for each grade category is found by dividing the class average by the number of letter grades as in Tables 1 and 2.

**Table 1**

Grading based on class average

Grade	Range of marks	Interpretation of grades
F	$M < \bar{M} - \frac{3}{2}\rho$	Fail
C	$\bar{M} - \frac{3}{2}\rho \leq M < \bar{M} - \frac{\rho}{2}$	Bare Pass
B	$\bar{M} - \frac{\rho}{2} \leq M < \bar{M} + \frac{\rho}{2}$	Average
A	$\bar{M} + \frac{\rho}{2} \leq M < \bar{M} + \frac{3}{2}\rho$	Good
S	$\bar{M} + \frac{3}{2}\rho \leq M < \bar{M} + \frac{5}{2}\rho$	Superior
D	$\bar{M} + \frac{5}{2}\rho \leq M$	Distinction

$$\rho = \text{band width} = \frac{M}{6}$$

**Table 2**

Grade	For 10% F and 10% D	For 15% F and 10% D	For 20% F and 10% D
F (Fail)	$M < (\bar{M} - 1.28\sigma_M)$	$M < (\bar{M} - 1.04\sigma_M)$	$M < (\bar{M} - 0.84\sigma_M)$
C (Bare pass)	$(\bar{M} - 1.28\sigma_M) \leq M < (\bar{M} - 0.64\sigma_M)$	$(\bar{M} - 1.04\sigma_M) \leq M < (\bar{M} - 0.46\sigma_M)$	$(\bar{M} - 0.84\sigma_M) \leq M < (\bar{M} - 0.31\sigma_M)$
B (Average)	$(\bar{M} - 0.64\sigma_M) \leq M < \bar{M}$	$(\bar{M} - 0.46\sigma_M) \leq M < (\bar{M} + 0.12\sigma_M)$	$(\bar{M} - 0.31\sigma_M) \leq M < (\bar{M} + 0.22\sigma_M)$
A (Good)	$\bar{M} \leq M < (\bar{M} + 0.64\sigma_M)$	$(\bar{M} + 0.12\sigma_M) \leq M < (\bar{M} + 0.7\sigma_M)$	$(\bar{M} + 0.22\sigma_M) \leq M < (\bar{M} + 0.75\sigma_M)$
S (Superior)	$(\bar{M} + 0.64\sigma_M) \leq M < (\bar{M} + 1.28\sigma_M)$	$(\bar{M} + 0.7\sigma_M) \leq M < (\bar{M} + 1.28\sigma_M)$	$(\bar{M} + 0.75\sigma_M) \leq M < (\bar{M} + 1.28\sigma_M)$
D Distinction	$M \geq (\bar{M} + 1.28\sigma_M)$	$M \geq (\bar{M} + 1.28\sigma_M)$	$M \geq (\bar{M} + 1.28\sigma_M)$

### Direct Grading

The draw backs in the marking system could be dispensed with if grading of students is adopted on a qualitative basis. This gives a more uniform means of evaluation, when adopted on a co-ordinated basis. This is more reliable as the students are graded in well defined bands of achievement. Moreover, it is easier to classify students into fewer categories than on a 101-point scale. Further, the entire scale is made use of by the examiners unlike in the marking system. This gives the students a wide scope for selecting the subjects of their choice.

#### *Direct grading method*

As all the methods of grading discussed earlier depend on marks, it is not completely free from the errors of the marking system. Further, research has shown that the examiners suffer from carry-over effect while valuing the scripts. If an examiner's marking of a script is influenced by the impression he had gained from the preceding

scripts, then he is said to have carry-over effect. For instance if script A is very good and is given a high mark, an impression of excellence may persist in the examiner's mind with the result that the succeeding script B gets a higher mark than it deserves. Further, within a script the examiner may be influenced by the quality of the previous answers. Direct grading could be introduced to overcome the above problems. This method involves awarding of grades directly instead of marks. Each answer could be graded on a 3, 5, 7 or 9 point scale. For the purpose of explanation the 7-point scale is being taken into consideration. Here, the answers are graded as 0, A, B, C, D, E or F with grade points 6, 5, 4, 3, 2, 1 or zero respectively. In this method, if an examiner has to value question number 1 (say) then he values the answers for question number 1 in all the scripts and proceeds for question number 2 in a similar fashion. Here, grades are awarded for each answer. Hence, to sum the grades for a script, the grade points of the grades for the questions are added with proper weightage (depending upon the weightage allotted for each type of questions in the question paper) allotted to them. This gives a grade point average for a script. The grade point average is calculated upto three decimal places and then rounded off to the nearest integer. The corresponding grade for a script is arrived from this grade point average.

#### *Grade Table Method*

In this method, the average of the highest percentage of marks obtained in a particular subject for three consecutive years is calculated. The scale is a seven point one. Keeping 35 percent as the lower limit for Grade D the difference between the highest percentage of mark and 35 percent is distributed over the grades C, B, A and O. As there is a possibility of students in the current batch getting better marks than the calculated highest percentage of marks, the upper limit for grade 'O' is kept as 100 in all the subjects. The marks range of 0 — 24 and 25 — 34 are allotted to the grades 'F' and 'E' respectively. Wherever the past data of marks are not available, the lower limit for grade 'O' is taken as 60 percent and the difference between 60 and 35 percent is distributed to grades C, B and A. These tables which show the relationship between marks and grades are called conversion tables. The overall performance of the students can be reported in terms of Overall Grade Point Average (OGPA) and Overall Grade. The OGPA may be calculated by combining the grades obtained by the different assessments in all papers with proper weights allotted for each of the assessments. The OGPA may be rounded to the nearest integer and the corresponding grade arrived at.

## CHAPTER VII

### GUIDANCE AND COUNSELLING

*“All guidance is education, but some aspects of education are not guidance: their objects are the same—the development of the individual—but the methods used in education are by no means the same as those used in guidance.”*

A.J. JONES.

#### *Need for Guidance and Counselling:*

Education at the University level is vitally concerned with the development of the personality of the student. This means that the teacher cannot afford to confine himself to solving purely academic problems. There are a multitude of other problems of a more subtle nature that constantly confront students. The teacher would need to use a human and personal approach in helping students to deal with them.

Personal problems arise because most of the students in our colleges fall in the age group of 15 to 21. This is a crucial period in their lives. They are adolescents who are growing into adulthood. As such, they are faced with problems relating to adjustment to a new environment, home sickness, feeling of inadequacy and inferiority, emotional upsets, family and social relationships, ethical and religious matters etc. Apart from these there may be other problems—educational, vocational, economical and those related to health. If left unsolved, these problems are likely to create in the young people, mental, emotional and psychological unbalance, feelings of insecurity and defeatism, and even antisocial traits. Herein arises the need for the teacher to offer guidance and counsel either individually or through an organised programme of guidance and counselling.

The Indian tradition sets high value on the teacher-student (Guru-Sishya) relationship. In the modern educational set-up, this laudable system is not practicable and needs to be modified. In this context the system of guidance and counselling as practised in the institutions of the West deserves careful study so that we can profit by their experience.

#### **Areas of Guidance and Counselling**

Under the guidance programme, the teacher can

1. form up-to-date progress charts of students and utilize them to gain a knowledge of the weakness and strength of every student, on the basis of which remedial measures may be devised.

2. assist students by
  - a) stimulating them to put forth their maximum efforts
  - b) guiding them in making choices of appropriate courses and institutions for further training, and
  - c) advising them on vocational matters
3. provide group activities which would contribute to the growth of students in specific areas
4. serve on specific guidance assignments such as the Orientation Programme, Guidance Committee or an Evaluation Team, and
5. counsel individual students on personal problems such as related to health, personality, emotional complexes, family and social relationship etc.

### **Counselling**

Counselling is one of the most important services that should be offered to the individual students and should constitute an important part of the total guidance programme.

Counselling is a personal and dynamic relationship between two individuals one of whom is more mature, experienced and skilled than the other. The former, through direct contacts, helps the latter to identify and define his own problems, to evaluate himself and his opportunities, to choose a feasible course of action and implement it, and thus to solve his problems by himself. Counselling helps him to see his problems in a clearer light and deal with them more realistically.

### **Counselling Technique**

You, the counsellor, should cultivate genuine friendliness for your students. You must try to weaken and break barriers of all kinds that often separate the teacher from the student. Your student will disclose his personal problem to you only if he has trust and confidence in you. Meet your students often. Adopt a sympathetic attitude. You would soon find that in such a congenial atmosphere friendship and trust grow easily. Your ideal should be to become friend, philosopher and guide to your students.

Counselling is a delicate art. You will have to have considerable skill and tact in discharging the functions of a counsellor. You must remember that as a counsellor you are helping the student not only to solve his immediate problems, but also to achieve self-direction enabling him to help himself in the future.

You must choose different methods in dealing with different students. Students differ from one another psychologically, intellectually and otherwise. You should obviously be highly resourceful in tackling individual students. Commonsense, tact, and a knowledge of the mechanisms of the mind, would be of great help to you.

Though success as a counsellor depends to a great extent on your own maturity and experience, and love and sympathy, a knowledge of the techniques of counselling such as the interviewing technique would help you to be more effective.

Careful interview and analysis help to ferret out the root causes of many problems. In searching for causes of a personal problem, sometimes one may have to go deep into the past. The counsellor has to be patient, for otherwise, he may mistake superficial symptoms for root causes. During interviews, counsellors should be very alert in detecting the emotional tones and attitudes of the counselee.

In dealing with a student's problem, it may be advantageous to have discussions about it with his warden, physical director, parents and close friends. A complete record of his activities in the institution, of his interest and ability and of his progress in various spheres would be a valuable reference source. The counsellor may gather from the student himself confidential information relating to personal or family problems and the like. Such information should be kept confidential and should not be turned over to the cumulative record.

### **Institutionalized Guidance**

Educational and vocational guidance may best be offered by a board of teacher-counsellors acting as a centre for the collection and dissemination of information regarding scholarships, higher education, job opportunities etc. Problems common to many students may also be left to such a board.

An orientation programme for new entrants may also be organized at the institution because problems of adjustment to the new environment are common to all students. The orientation programme may cover such items as acquainting the new entrants with the set-up of the campus, its facilities and regulations, and its traditions, and introducing them to teacher counsellors. The orientation programme would help the new entrant to settle down to his work speedily and to know where to turn in times of need.

While educational counselling helps the student to solve a problem it should in the process enable him to move towards greater self-dependence. An educated person must have the capacity to think and act for himself. Educational counselling should have this objective. You should not be in a haste to reach a decision; but you should help the student to make the right decision for himself. ‘Coddling’ the student is a mark of unskilled counselling; the relationship between you as a counsellor and the student should be so built up as to encourage in him self-exploration and free expression.

It may not be possible for us to give an answer to all the problems with which the students are confronted. We can help however in surfacing and formulating the problems in such a manner that will help the student to tackle them by himself. Ultimately we are helping him to get self confidence and a sense of responsibility, while at the same time guiding him to achieve an integrated personality and a balanced view of life. Any amount of effort and time put in by you, the teacher, in this regard will not be too much.

*“You can only serve. Serve the children of the Lord if you have the privilege. If the Lord grants that you can help any one of his children, blessed you are. Blessed you are that privilege was given to you when others had it not. Do it only as Worship.”*

—SWAMI VIVEKANANDA

## CHAPTER VIII

### QUALITIES OF A GOOD TEACHER

*“No teacher who is not a master of the field, who is not in touch with the latest development in his subjects and who does not bring to bear upon his duties a free and untrammelled mind, will ever succeed in inspiring youth with that love of truth which is the principal object of all higher education.”*

—REPORT OF UNIVERSITY EDUCATION COMMISSION, (1949)

“The more a professor knows, the more he knows what he does not know.”

The profession of teaching which is often termed the noblest makes great demands on the teacher. The qualities expected of him are not all inborn and have to be cultivated. It is difficult, however, to generalize, for each teacher is an individual with traits, abilities and mannerisms, which are his own. For example a teacher may have eloquence but lack ability in discussion; another may have a searching intellect but a poor expression. Every good teacher has a certain originality added to the generally accepted qualities of a teacher. Again, methods of teaching vary to suit the levels of teaching, the environment and the teaching situation. A good teacher is one who has professional competence along with a talent to vary his methods and to make teaching lively and instructive in a given situation. Though it is hard to attain perfection, it should be the endeavour and objective of every teacher to equip himself to attain the state of excellence.

Some consider college teaching as a ‘mystery.’ The saying that good teachers are born not made cannot be accepted as fully true. Good teachers are no more ‘born, not made’ than good engineers. In each we have inheritance combined with efficient training, continued practice and a determination to succeed. It should be the effort of everyone to improve his teaching competence. It would be useful to consider the qualities that are generally accepted as being basic to a good teacher.

#### **An Integrated Personality**

First of all, it is necessary for a good teacher to be a good person. As a teacher you have a profound influence on your students in moulding their character and in contributing to their thinking and activities. You not only teach them the lessons and techniques, but also communicate to them indirectly your attitudes, values and ideals. It is the latter things which impress your students most as Mahatma Gandhi says—“I have always felt that the true text-book for the pupil is his teacher. I remember very little that my teacher taught me from books, but I have even now a clear recollection of the things he taught me independently of books”. Every act and every word of the instructor motivates or discourages each student. Professor Humayun Kabir states that “The living example of the teacher is the most important factor in developing a sense of values among his pupils. The teacher must never forget that the keen eyes of

his pupils are constantly watching him. The standards he sets, the actions he approves, the manner in which he handles his subject, his personal relations with his pupils, the way he behaves in the class room and outside are all being watched constantly.”

It is therefore essential that you should have an integrated personality to serve as a model to be followed. You should have a sense of values if you are to impart one to your students. You should have a group of personal traits such as enthusiasm, integrity, candour, sympathy, patience, emotional stability, wisdom and interest in people. You should cultivate a cheerful and optimistic view of life with a rich sense of humour, but no trace of destructive sarcasm. Above all, you should have a sense of commitment and dedication to your work; you should have sincerity in your sayings, honesty in your actions and loyalty to your profession. You should make full use of the background you have acquired during your education at the university that made you a gentleman and a scholar of taste. It must be borne in mind that your students should acquire from you these traits rather than be stuffed with inert ideas.

### **An Insight of the Student World**

The first interest of every teacher is in teaching students. To do this effectively an understanding of the feelings and reactions of students is essential. You must appreciate and develop an interest in the problems of young people. You should have the courtesy to listen to their ideas and apprehend their view point. Kindness, fairness, tolerance, courtesy, respect and good judgement are avenues of approach into the inner minds of the individual students. You should remind yourself of Emerson's statement that “the secret of education lies in respecting the pupil.” Prof. Humayun Kabir while stressing the moral and spiritual values of education observes that “a teacher must have regard for the personality of the pupils placed in his charge and must thus be a person endowed with intellect, imagination and, most important of all, sympathy with the young.” You must be fair in the treatment of all your students in every respect.

The good teacher gets a great satisfaction in watching young minds and personalities develop and in his ability to influence and stimulate their growth. He possesses a vivid awareness of his mission. He knows that he holds in his power a small measure of another's destiny. You must always have a watchful eye so that you can direct the development of mental discipline in your students. You should have a sternness to do a good job. The instructor who permits the back seaters to slide unbraked, who allows the students to commit a breach of educational contract without being admonished and who establishes a set of procedures or rules for educational conduct and then ignores them, will lose the respect and confidence of his students.

### **An Intellectual Capacity**

Intellectual capacity is one of the most essential qualities in a teacher of higher education. Not only does the professional matter require intellectual power, but the art of effective teaching involves abstract ideas not comprehensible to the ordinary mind.

A critical mind is one of the most important of several intellectual capacities. You must train your mind to acquire the habit of exercising independent and unbiased judgement, to learn to discriminate between the adequate and the inadequate, the relevant and the irrelevant, and to avoid the extremes of haste or indecision in arriving at conclusions. The untrained mind jumps at conclusions; the educated mind considers the new idea, ponders over it, analyses, examines and discovers its relation with established ideas. Such a critical process enables the development of an analytical type of mind.

An ability to think quickly is another characteristic of good teachers. You must be able to think quickly while standing before a class and should err but infrequently. But at the same time you should have the intellectual honesty to admit an error or the inability to answer a question without further study.

A good memory is yet another requisite for a good teacher. Memorizing is a deliberate act of intentional learning. It places the material learned in the mind and impresses on the mind the meaning, the outline and broad relationships of the material. It has its value in specific subjects and situations if it is done purposively and meaningfully. Hence you should be acquainted with an easy method of memorizing. You should approach all mental work calmly and unhurriedly; locate and organize the important points in the material to be memorized, meaningfully; and memorize your material as a whole and not as disjointed bits. But, as far as possible, replace routine memorization with interesting thinking.

### **An Interest in the Subject**

To become a successful teacher you must know your subject well. It is your responsibility to learn and be well informed. It is not enough for you to acquire just the amount of information which is to be taught in the classes. You should get acquainted with the new developments in your subject. You must be able to have at least a glimpse of the upper regions of your subject. It is but natural that if you know your subject well you will have an interest for it. Only when you are imbued with the spirit of your subject will you be able to arouse interest in your students. There may be instances too of some teachers who teach subjects without liking them. Such teachers obviously are either not aware of the deeper meaning of education or are insincere to the cause which they are apparently serving. Consequently they are bound to fail to guide properly the young minds left to their charge. It is therefore essential that you should choose a subject in which you are actively interested. To maintain certain interest in the subject you teach, you may select for specialization certain portions of your subject which you feel are interesting and illuminating.

### **An Ability to Create**

Good teachers are always personally creative and are able to inspire their students to creative endeavour. Hence you should take interest and perform creative work in teaching, writing, research or professional activities. Dr. A.L. Mudaliar has rightly

pointed out that "no college could be said to have worked successfully which does not besides the teaching that is imparted to the students, contribute to an increase in knowledge through research and other activities of the teachers in that college." Such activities, in addition to developing the intellectual capacity of the teacher, help to draw students into active participation in the learning process.

### An Ability to Impart

Eventhough a thorough knowledge of the subject matter is an essential qualification, such knowledge alone does not imply the guarantee of a good teacher. Possession of knowledge or understanding is not necessarily accompanied by the ability to impart it to others. It is this transmission of the understanding of the subject matter from teacher to student that must be accomplished. A good teacher possesses a high 'transmission efficiency' in addition to a mastery of the subject. As far as the student is concerned the teacher's intellectual command of his field may mean nothing if his transmission ability is poor. The product of both the factors should be high in order to accomplish the desired result. Hence you should possess the ability to put across your knowledge to your students in a vigorously living and meaningful way.

A clear, understandable, well projected voice pleasant to the ear and free of annoying mannerisms improves the 'transmission efficiency' by drawing the attention of the students. It must be admitted that the charm of many a good oration is marred completely by incorrect accent and pronunciation. As a teacher you should try your best to have a thorough command over the medium of instruction. You must develop idiomatic use of the language, increase your vocabulary as much as possible and pay special attention to your pronunciation.

If you have a strong sense of humour, you can succeed in keeping your students attentive. But it must be remembered that humour should not be used to make fun of the students. The real purpose of humour in teaching is deeper and more worthy. "It is to link the pupils and the teacher and to link them through enjoyment."

*"I am not a teacher; only a fellow traveller of whom you asked the way. I pointed ahead—ahead of myself as well as of you."*

—BERNARD SHAW

## CHAPTER IX

### SELF EVALUATION

*"I have made mistakes, but I have never made the mistake of claiming that I never made one."*

—JAMES GORDON BENNETT

It is well that both in his own interest and in the interest of those who would be left in his charge, the would-be teacher turns the search light on himself and on the teaching profession and decides whether both are compatible.

If you are already a teacher then reflect a little on your motives in becoming a teacher and on the role of the teacher. Decide whether you should stay on in teaching or not, and if you should, then find whether there are deficiencies in you and your methods and how best you can improve yourself.

#### Role of a Teacher

You must know that a teacher occupies a tremendously important place in the context of the advance of civilization. The character of a nation is determined by the character of the individuals who make up that nation. In your position as a teacher you are helping to develop the human resources for the next generation. Your work with the students, therefore, has its effect upon the shape of things to come. Through them you can contribute much to the maintenance and improvement of a free society. Your class-room is the spring-board of the scientific advancement, cultural growth and intellectual enrichment of civilization. You may feel that your job is teaching the subject, but really you are teaching people—people who will be the engineers, the scientists, the artists, the industrialists, the public administrators and the leaders of the society of tomorrow.

Your influence upon the students is in the nature of a chain reaction, because one never knows where the effects of a good deed end.

The vast majority in the teaching profession, if not all, can become better teachers by consistently devoting a part of their spare time to self-improvement. Those who develop into really good teachers are not the ones who do only what is required of them, but those who do the extra things above the line of duty in order to become more efficient. The extra effort that you spend in self improvement will be amply rewarded by the pleasure and personal satisfaction of feeling that your students are better prepared by you to meet their professional and social responsibilities.

## Aptitude for the Profession

Self-improvement is possible only when there is an aptitude for the profession, a feeling of being at home in it and a consciousness of it being rewarding both materially and spiritually. Before you settle down as a teacher be sure that teaching as a profession means all this to you. One may choose the teaching profession because he likes it and, incidentally, it provides him a livelihood also, or one may choose it merely because it provides an opening for his livelihood. If you belong to the latter category, it is time you left teaching and chose a profession of your liking.

Your liking or dislike for the profession will be reflected in your work; your students will see it; your colleagues will observe it. If you like your profession and are proud of it, you would do your utmost to your profession.

It is not rarely that we find a 'Teacher' regretting his choice of the career and lamenting the misfortune that has befallen him. Such a person looks at things solely from the material view point. He has lost sight of all that makes teaching the noblest of professions. Such a teacher has made a mistake whose adverse effect will be felt not only by him but by many a student. As a teacher, you are taking part in the processing of delicate mechanisms—the students. The nation cannot afford your mistakes.

## Self-examination

A teacher should never fall into the rut of complacency, nor make the mistake of imagining that he has reached perfection. There should be a constant attempt at self improvement. To this end you should submit yourself to criticism-by yourself, by your colleagues and your students and adopt remedial measures directed towards betterment. You must make a careful study of the results of tests and examinations to find whether you have succeeded in your aim of imparting knowledge and inspiring students, and analyse how far the failure of students is due to your deficiencies and how best you could change your methods to facilitate better transmission of knowledge.

However much you analyse yourself and your methods, you may not always be able to spot out certain drawbacks in you which may be apparent to others. It would therefore be profitable for you to invite suggestions and criticisms from your colleagues and the students whom you teach. Students' opinion of you and your method of teaching is valuable because it is ultimately they who are affected by your deficiencies. You may, for the purpose of eliciting opinions, make use of instruction improvement sheets. You may yourself frame other such questionnaires to suit your particular needs. Such opinions must be used only to locate serious faults, because they may not be wholly reliable.

Self-appraisal and constant self improvement should become a habit with you.

*"Dissatisfaction with oneself is one of the fundamental qualities of every true talent."*

—ANTON CHEKHOV.

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