

Teaching

methods



FOREWORD

This book has been written by Mr Alan Hart specifically to inform instructors in footwear production at Central Footwear Training Centres, Agra and Madras, of the teaching methods most widely adopted for successful student development on British BTEC Certificate and Diploma Courses. The contents have a wide application, beyond the immediate interests of footwear technology, for teachers engaged with practical courses for industry and commerce, where the object is for students to learn and practice technical skills, as well as to acquire knowledge and the confidence to think for themselves and to make management decisions.

The keynotes are to maintain student interest, to involve them in the learning process, to provide variety, and to encourage development through continuous assessment. Mr Alan Hart writes from experience based on thirty years of teaching College students and industrial apprentices. He was formerly Chief Instructor in Footwear, Kendal Technical College, and now acts as a consultant to industry, particularly the footwear industry, in production methods and techniques, quality and personnel motivation.

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LIST OF CONTENTS

INTRODUCTION	Page	1
OVERVIEW	Page	3
ESSENTIALS	Page	6
CHOOSING THE RIGHT METHOD OF INSTRUCTION	Page	14
THE LESSON	Page	24
HOW DO PEOPLE LEARN?	Page	29
GENERAL PRINCIPLES FOR INSTRUCTORS	Page	32
THE USE OF QUESTIONS IN INSTRUCTION	Page	39
SELECTION OF VISUAL AIDS	Page	41
END OF LESSON	Page	50
STUDENT EVALUATION	Page	51
PRACTICAL TEACHING TIPS	Page	53
APPENDIX A	Page	59
B	Page	60
C	Page	61



INTRODUCTION
P E D A G O G I C S
SCIENCE OF TEACHING

Teaching is defined:

Enable, cause, by instruction and training, give lessons on subjects.

Give instruction to educate, explain, show, state by way of instruction.

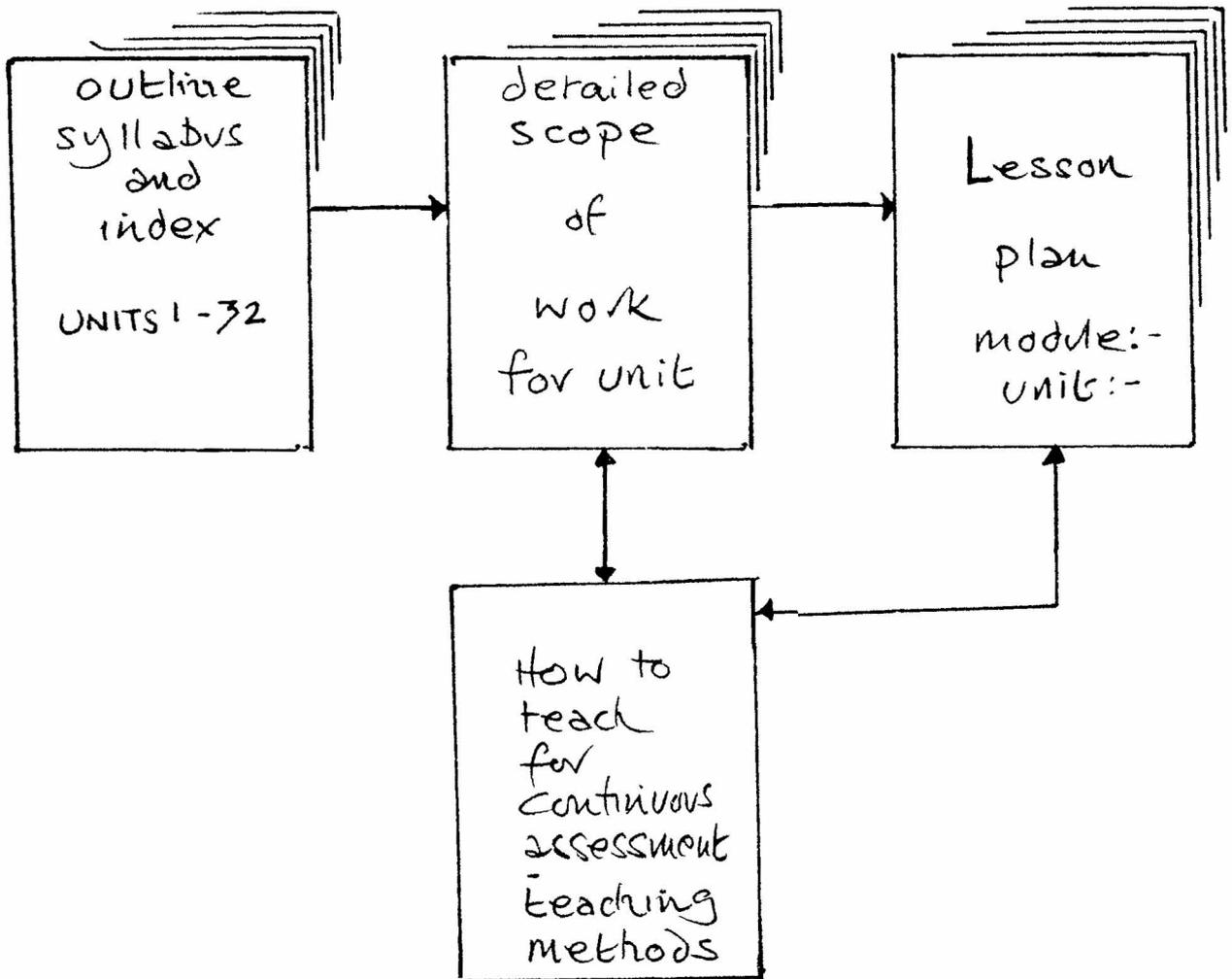
These are just some of the many definitions given to the profession of instruction for learning.

However, teaching is really all about two-way communications. It is no good the teacher knowing the subject if the student cannot grasp the information and then demonstrate that understanding.

Too often we assume that people know what we are saying without regularly checking to make sure they comprehend the meaning of spoken and written words.

How often, when translating from one language to another, from one culture to another, do words and meanings change out of all recognition. This book has been written to enable us to use all available facilities at our disposal, and to increase the impact and understanding of what we wish to communicate.

We suggest that nothing beats 'preparation' of the technical information and equally, the manner in which the information will be presented. Students welcome variety in instruction. This, then is a pedagogic primer.



Completing a statement - a statement is shown in which the missing word(s) have to be fitted in

a) polymerisation is completed whentake place in the presence of as a catalyst.

b) mulling is also known as.....

The illustration shows three students sitting at a desk. The student on the left has a thought bubble saying 'TRUE!'. The student in the middle has a thought bubble saying 'false!'. The student on the right has a thought bubble with a question mark '?'.

Points to note

- restrict answers to one or two words only
- There must be only ONE correct answer.

OVERVIEW

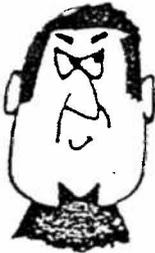
We must begin any teaching analysis by focusing on the learners and their requirements. Learning should be informative and enjoyable. Students/trainees learn more quickly and with lasting value if the method of instruction was user friendly. Learning by rote helps no-one and leads to a narrow subject perspective. Learning that is both informative and enjoyable lasts in the mind for ever - therefore;

KNOW YOUR AUDIENCE



Perhaps the most common error made in preparing a talk is in not knowing enough about the audience. It is easy to assume that all those in the group facing you are very similar, and that you can aim your remarks at that friendly looking person in the third row. But groups are rarely comprised of similar people, even if they all do the same sort of job in the same firm. And all the things which make them different are the very factors which can mean your talk doesn't provide what they expect or need.

You can get a lot more done if the audience is on your side; if it isn't you have to get them to the point where they will listen, or you have really wasted their time, and yours.



Will you have the shop floor workers mixed in with the management, each with an axe to grind or a point to press home at the expense of others? Do they all have the same length of work experience and the same educational background? All of these factors will influence how the group responds to you, and if you are aware beforehand, you can avoid difficulties as you go along. Once again, remember that you are in charge. If you know something of the group's background, you can deliberately mix the sub-groups to your advantage, often using their combined expertise to complete a task or arrive at group consensus. Any speaker (teacher, facilitator, or what have you) who thinks it enough to say "Break into groups of six..." without knowing which six will go into each group is asking for trouble! You decide the tasks, you decide the groups and you control the outcomes.



In addition to these obvious differences, there are other factors which will influence how you and your message are received. For instance, all of us have had considerable experiences as learners in the past. Some of us liked learning, and others hated

it; some were successful, and others failed. The sorts of experiences we had in the past will affect how we respond to new, but similar experiences. If someone hated school and all that went with it (desks, writing, blackboards, and teacher) how do you think they will react to rows of desks with a 'Sir' up front? If you know something about their past experiences, you can try to arrange matters to make your session non-threatening and productive. A non-schoolroom atmosphere is sometimes only a matter of rearranging comfortable seating in



a semicircle or 'U' shape, so everyone can see and hear clearly. But how you treat the group is also important because nothing is more off-putting than being told what is good for you. The more that people can participate in what is happening to them, the greater the likelihood that learning will take place. And if the participating involves fun and a bit of a challenge, so much the better.

We also have our own 'learning styles' which influence how we receive and deal with information. Consider how you and the people you know learn best. For example, if you want to buy a new radio, do you:

- *read reports in the paper, journals or trade press?
- *ask friends what they think?
- *visit a radio shop?
- *try various models?
- *or a combination of some of the above?

Your answer is probably the latter - and the same is true with other learning encounters. Some people like reading and respond well to lots of written handouts, articles, references, etc. Others learn best through listening to people talk. Some people like to see things for themselves, relying on the visual aspects of pictures, films, or the real thing. And yet others will want to get in there and do something themselves.

If you accept that the above are all ways of learning, then you must be prepared for groups of people with differing approaches. You can plan your approach to cater for different learning styles and keep most of the people happy most of the time. Don't be fooled into thinking that your own chosen learning style will be the same as that of all your audience.

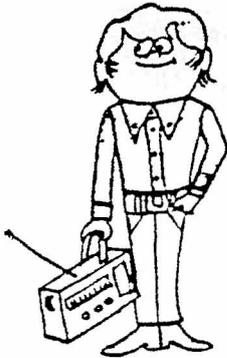
Take time to study each group of students, note when they respond particularly well, use that method with that group often. Most students like the competitive element of a group quiz and that is one of the easiest ways to reinforce 'learnt' materials.

When addressing students for the first time, it is a good idea to ask what their expectations and outcomes of the course are! The answers will be a valuable insight into the attitudes of the group.

If you look at the subject about which you are going to speak you need to consider how you acquired your own knowledge. It may be that you studied it in an academic way, but it is much more likely that your own subject knowledge was built up over the years through practical experience, attending courses, reading literature, and in general discussions. In fact, with many subjects, you have been adding to your knowledge all your life.

Educationalists speak of the 'spiral curriculum', meaning that people encounter subjects at various stages in their lives, and each time they look at that subject in a new light, perhaps from a different perspective.

People usually start learning about different aspects of the subject under study at an early age and gradually build up - possibly to a fairly advanced level.



There may then be aspects of life experiences in their academic studies, and so on. In fact people often don't realise just how much they actually know, because they have been slowly adding to their knowledge for such a long time. So when you have to talk about your subject, you don't know where to begin.

What often happens is that the teacher considers all that he or she knows about the topic, perhaps from the perspective of how they learned it. They then make some mental assumptions, juggle things in the air, and come up with what they hope is a realistic approach. The assumptions might include;

1. I can't teach it at all, because there is too much to know.

2. I have been at it longer than the learners, and I am entitled to make some choices based on my experience.

3. I have taught it in a particular way before and it seemed to go down well.

4. I have previously prepared materials (some originating from when I studied the topic) and it would be a crime not to use them.



ESSENTIALS

Just suppose you have been asked to teach a subject and been given three hours per week for six weeks, which you feel is more than adequate to get to grips with the subject. Then imagine the panic when you are told there has been an error and you have to talk about the same topic, to the same group, for only one session - three hours in all. What are the essentials you would take from your original plan? What must the learner know?

If you argue the case with the powers that be, you may be given a reprieve and more time for your talks, so you might now be able to include material that the learner should know. And if you get back all your original time, you would be free to cover all the extra material that the learner could know.



Thus, instead of arbitrarily selecting material for your talk, you could decide what the learner MUST know, SHOULD know and COULD know, and begin planning from there. Another way of deciding what to cover in a talk, which also arises from a consideration of both the needs of the learner and the nature of the subject, is to bear in mind those areas in ourselves where learning 'takes place'. While this is not the only way of establishing the learning process, it is a useful approach, as it often appears in the language of education and training - and most professional bodies make use of the jargon.

When considering where learning 'takes place', most of us would first think of the head because most learning seems to involve thinking or intellectual skills. (Educationalists call these cognitive skills). These include facts, ideas, understanding, making judgments, and anything else that we do to know things.

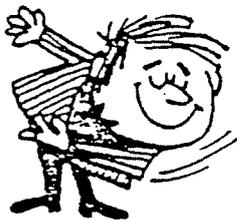
If, at the end of your talk or course, you expect the learners to have increased their knowledge or understanding, then you (and they) are working with their cognitive skills.

An example would be a straight lecture covering the legislation concerned with handling dangerous substances, where the learner expects to come away 'knowing' more than when he started.

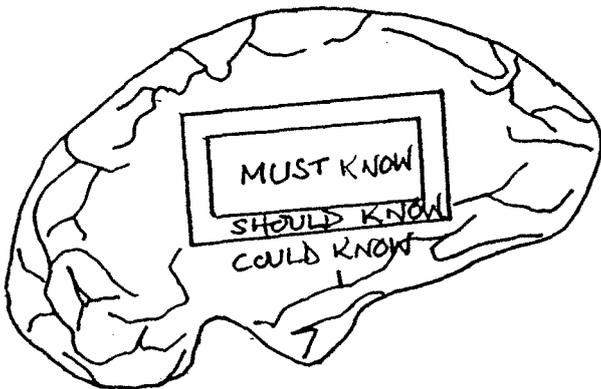
<u>SKILL</u>	<u>AREA</u>	<u>JARGON</u>
INTELLECTUAL	HEAD	COGNITIVE
PHYSICAL/ PRACTICAL	HAND	PSYCHOMOTOR
ATTITUDE/ EMOTION	HEART	AFFECTIVE

If, however, you expect the learners to be able to do something practical or physical, with their hands, then you and they are working in the area of **psycho-motor skills**. (Psycho' involves the mind, and 'motor' involves movement; in other words, brain-hand co-ordination). This can include working with tools and equipment, performing tasks, inspection of materials, and so forth. Most physical skills also involve a considerable amount of 'knowing', as we rarely carry out a task without thinking about it to a greater or lesser extent.

Finally, there is learning about ourselves, our feelings and emotions. If you are trying to influence how your learners behave in terms of their attitudes, then you are working in **the affective area**, the realm of the heart. We all know people who have what we consider to be a healthy attitude towards their work, their safety, etc. And we also know people who are careless of themselves and of others.



In order to plan and design a session which is going to provide what the learners need, you therefore have to consider both what and how much they need to know in the allocated time, and the 'area' in which this will take place. The different areas of learning require different approaches, and these make greater or lesser demands on your time.



Learning in the intellectual, or cognitive area, requires that you present the learners with the knowledge in a form that they can understand, using the appropriate language level and illustrations. It helps if it is divided and presented in such a way that it is easy for the learner to 'store' the information and retrieve it when it is needed.

You should make sure the learners can 'use' the information they have acquired, perhaps by letting them do something with it like solve a problem, and then let them know whether they have done it correctly.

If you are dealing with physical or practical skills, you need to show the learners what it is that they will have to do, and show them how to do it in some considerable detail. Then you must allow enough time for each learner to practise the newly acquired skill under supervision, and provide enough feedback so that the learner knows whether he has accomplished the skill. It is not good enough to demonstrate a task and then get one learner to practise, or ask the group "Can everyone do that?"

(How many learners are going to be brave enough to say "No" in front of colleagues?) Allowing time for practice may mean less time for theory, so you may only be able to include the "must know" information. Good sessions are a question of balance and planning.

If you find yourself working in the area of attitudes, you must somehow show the learners what their existing attitudes really are. This might involve discussion or role play, or video work, but whatever it is it will take considerable time. You then need to provide new information which might influence their existing attitudes, and give the learners time to make the necessary adjustments. It is not a simple process to change peoples' life styles, ways of working, etc.



When planning for the correct balance, you also have to consider what the learner will do with what you cover. Does everyone need all the information or can you tailor your talk to the needs of a specific group? Some people may need the explanation behind the skill. Looking in detail at what people actually do - either by reading their job descriptions, speaking to supervisors, asking them, observing them, or reading information from their union or professional body - can provide useful guidance. Sometimes a syllabus, or list of topics to be covered, will be available, and selection can be made from it.

THOROUGHNESS

Don't, however, be tempted to cover the entire syllabus, or everything that you are asked to do, without very careful thought. It is much better for the learners to handle a limited amount of material thoroughly, so that you can honestly say they have taken it all in, than to skim over the surface of a lot of information in the hope that some of it has been absorbed. Simple exposure to knowledge does not mean that the person has taken it in and can make use of it.

Although it seems a slow way of getting into a teaching session, being aware of your audience and the ways in which they might best learn, within the context of your subject, is a good sound basis for a constructive and useful session.

The way in which a lecturer approaches a teaching session depends on a combination of factors, the major one usually being the learners: who are they; what are their backgrounds; why are they there; and so on? Next one considers the subject and how it is to be covered: what breadth and depth are required; what are the aims and objectives; is it theoretical or practical; is it examination orientated; etc? Third, one must be aware of any constraints which limit what is done:

how much time is there for the session; who will teach it; how many learners are there; what is the venue like, and how is it equipped?

STRICT STRICTURE

If any one of these factors changes, it is likely to affect the others as well. It is, therefore, unwise to be too rigid in planning a session, as each approach to teaching must be considered on its own merits. Many of the problems will suggest their own solutions if the tutor uses a lesson plan.

A lesson plan should also contain a rough estimate of timing. It is not necessary to break things down by the minute, as most sessions need a degree of flexibility. But an indication of the proportion of time devoted to the introduction, development and conclusion will keep the tutor on the right track. An hour long session with a rambling, fifty minute introduction, or a session where the hour finds the tutor only half way through his development, won't impress a critical audience!

The key to organising a successful teaching (and learning) session must lie in the activities which participants undertake. The traditional approach often considered the "content", which gave an indication of what the lecturer would cover. Thus a "quality" session on control methods would have its content something like this:

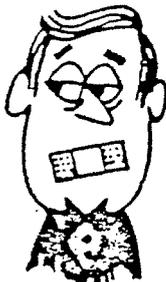
- * Non conformance assessment
- * Data gather systems
- * Control chart types
- * Non conformance elimination

This would be seen as a justification for the lecturer monopolising the session and "covering" the topics listed. But it must be remembered that just because one person "teaches", it does not necessarily follow that other people "learn".



It is one of the principles of learning that the greater the level of learner-participation, the greater the likelihood of learning taking place. So instead of concentrating on what the teacher is going to do, first consider what the learners are going to do.

THREE DOMAINS



Which brings us back to the three "domains" in which learning takes place. It is important to base the learners' activities on what it is they have to accomplish to fulfil the session's objectives. The learners will be working on intellectual/knowledge

(the cognitive domain), or practical/physical skills (the psychomotor domain), or on attitude/behaviour understanding (the affective domain). Each area makes different demands on the learner and requires a different approach by the teacher selecting activities.

Trying to match the appropriate teaching method to what the tutor wants the learners to be able to do requires care. Certain methods lend themselves to learning in specific domains, although most of the more common methods can be readily adapted to suit circumstances.

A good lesson plan will highlight the learners' activities as being central to the process. At each stage of the lesson, the tutor should ask himself "What will the learners be doing now?" - and "how will it help them learn?"

Let's take some typical examples of parts of lessons and put this into practice.

Lessons begin with an introduction - but what is supposed to be happening at this stage? Perhaps the tutor wants to arouse the learners' interests in order to get them enthusiastic about the topic. Or maybe there is a need to check how much the learners already know about the topic. How are the learners to be encouraged to become actively involved with specific materials or ideas or problems?



INTRODUCTION

If the session is about factory safety, the introduction could make use of one or more of the following approaches:

- * Get the learners to divide for small group work and list six "things" about the factory that they already consider unsafe (equipment, practices, etc).

- * Give the learners a fairly detailed case study about a factory and have them present individual analysis of the problem cited.

- * Use question and answer to extract personal experiences of accidents or near-accidents caused by breaches of safety rules.

- * Organise a role play or simulation exercise, with the learners playing identified parts to highlight safety aspects.



Any of these introductions involves a lot more learner participation than just sitting there listening to the tutor ramble on. The introduction to a session is vital, because how it is organised will set the tone for what follows. If the learners find themselves actively participating in the first few minutes, they will be willing to carry on contributing throughout the session. But if the session starts with a long, dry, listening session, the learners will accept that as the norm and "turn off" for any future work that may be planned.

It is also possible to concentrate on the learners' activities in the development and conclusion of a session, always planning around what they will be doing. If the tutor accepts that it is better for the learners to participate in the process, rather than be passive recipients, then it becomes second nature to choose methods which will encourage this participation.

In the area of practical and physical skills the most common method to encourage active learner-participation is demonstration and supervised practice. However, as with any method chosen, they must be correctly employed to get the most benefit for the learners.



SUPERVISION

Demonstration on its own is not a particularly easy way in which to learn a practical skill. (Anyone who has watched a TV cook effortlessly prepare a dish on screen, only to get in a hopeless muddle themselves when trying it out in their kitchen knows this to be true!) The demonstration must be followed by well supervised practice in order to consolidate the learning and ensure that it is learned correctly.

And this supervised practice must be carried out for all the learners. Everyone has been in sessions where something is demonstrated, and the tutor then asks one person (usually the keenest and most skilled participant) to carry out the task. This person does it satisfactorily and the tutor turns to the rest and says "So you can all do that now, right?" Few people would have the courage to admit that they couldn't do it, so they slink back to work and bumble through by trial and error.

The major problem with demonstration and supervised practice is that it takes time - time to set up, time to carry out, and time the follow up with all the learners. Demonstrations also require space - an area in which to demonstrate where everyone can see and hear clearly. There are a few basic techniques of demonstration which, while not guaranteeing success, will make it more likely. Needless to say, the health and safety of the tutor, and all the participants must be ensured.

Practical sessions with learners (who, by definition, are not experienced or skilled) are inherently dangerous.

First, make sure you are adequately prepared. This means that you have to be completely familiar with the technique yourself. It is no good demonstrating the use of a new piece of equipment if you have to read the manual with the learners looking over your shoulder!

Second, make sure your room is prepared. Do you have enough material, equipment and space for all the learners? Will you be working in the middle of a noisy factory floor, or in a quiet area away from interruptions? Can you get colleagues to help in the supervision of the follow-up practice? It certainly makes the time go faster for everyone if the learners don't have to wait until you get around to supervising them. (It can also get pretty tricky if there is a large group of press-ganged learners idly waiting around for something to happen!)

Third, it is necessary to ensure that the learners know what is expected of them. Run through the process, explaining what the end result will be, and showing the finished product if there is one. Allow time for any general questions, so that the learners have something on which to focus when you demonstrate the process in detail.

DEMONSTRATION

The demonstration itself can be approached in a number of ways. Some people use the whole-part-whole technique, in which they run through the whole process, then break it down into small parts and ensure that each is fully understood, and finally run through the whole procedure a last time.

Others take each procedure separately, with the class carrying out the technique step-by-step under the watchful eye of the tutor. This takes some organising, but it can ensure that everyone is at the same stage at the same time. Small errors can be corrected and the learners can be encouraged to compare their efforts with those of their colleagues and the tutor. Of course, the process being demonstrated has to lend itself to lots of people working separately at the same time; it is no good if there is only one piece of equipment on which to work!



Whichever technique is used, it is helpful to go over it again, perhaps asking different members of the group to 'talk' the tutor through the procedure to reinforce the learning. This can logically lead to the learners carrying out the task themselves, with the tutor (and colleagues if possible) supervising each and every learner until the technique is well and truly learned.

A correctly prepared demonstration, along with adequate supervision of all the learners' practice, can go a long way to ensuring that practical skills have been learned in a safe and supportive environment.

To summarise so far:

How do people learn the right skills and knowledge so that they will be able to do their job efficiently and safely? A lot depends not only on the complexity of the job but also on people's backgrounds, education, attitudes, etc. The teacher should take into consideration the group (or individual):

- *How quickly can they learn?
- *How will the teacher know that they understand the instruction?
- *What visual aids should be used?
- *What will be the best teaching method?
- *How much preparation and planning is required?

Before undertaking any instruction the 'trainer' needs to seek answers to the following questions:

What is the aim?

What is the purpose of the instruction?

What is the intended end result?

What are the objectives?

What will be achieved by the completion of the instruction?

What preparation and planning is required?

Duration of instruction?

Where will the instruction be given?

What visual aids will be required?

How will the trainees be motivated to learn?

How will understanding be checked?

In much more detail let us look at -
CHOOSING THE RIGHT METHOD OF INSTRUCTION

INSTRUCTIONAL METHODS,

Many of the terms used in connection with instruction, because of their similarity, cause confusion. The following definitions apply:

Method

An instructional method is regarded as the basic approach to instruction - e.g. lecture, demonstration, lesson, seminar, etc., or a combination of similar approaches.

Technique

A technique is a means of instruction complementing a method - e.g. questioning, use of aids and equipment etc.



CHOOSING THE METHOD

There is no one best method which is applicable to all training situations. The most an instructor can do is to choose the method most compatible with his objectives and with his own and his student's ability within the constraints of the organisation, accommodation, time, facilities, etc. The factors which must be considered are listed below:

Objectives

The training objectives of instructional sessions are of paramount importance.

The training objectives for individual sessions should be expressed in terms of :

what the trainee has to do at the end of the session;

how well he is required to perform;

the circumstances/conditions under which performance is required.

Subject Matter

The subject matter should be considered before the method is chosen.

Is the subject matter likely to remain unchanged for an appreciable length of time?

Will it alter rapidly in response to modifications in equipment or procedures?

Is it verbal or manipulative?

Is it difficult to assimilate?

These and similar questions will indicate whether the method is appropriate to the subject matter.

Target Population

Under the heading 'target population' are included class, size, aptitudes, experience and educational level of the trainees. All these points have a bearing on choice of method.

Instructional Staff

Selection of method should be influenced by the abilities and competence, etc. of instructional staff.

Facilities

Each method makes its own demands on facilities - equipment, aids, instructional materials and accommodation - and they should be considered when the method is chosen.

Costs

Costs are interlinked with other factors, but in any case investment in particular methods should be offset by genuine advantages e.g. in reducing training time, number of instructors, etc.

Time

Time must influence choice of method; for instance, discussion and lesson methods need more time than lectures. Time of day can also be important - methods making heavy intellectual demands on students are usually unsuitable for early post-lunch periods.

METHODS

The following part of this section describes the methods and combinations of methods most often used.

THE LECTURE

The lecture is: 'A straight talk or exposition, possibly using visual or other aids, but without group participation other than through questions at the conclusion'. Group participation is thus mainly auditory.

A lecture can be used to:

Indicate rules, regulations, policies and course resources to trainees.

Introduce and provide a general survey of a subject, its scope and its value.

Provide a brief on procedures to be adopted in subsequent learning activities.

Set the scene for a demonstration, discussion or presentation.





Illustrate the application of rules, principles or concepts.

Recapitulate, add emphasis or summarise.

Although the well-known gibe, 'A lecture is a method of transferring information from the notebook of the lecturer to the notebook of the student without passing through the brains of either', has some justification, a **well-planned and skilfully delivered lecture** has advantages in that:

The instructor can present more material in a given time than he can with any other method.

There are virtually no limits on class size.

Content and sequence are completely under the control of the lecturer.

Almost any type of training area is suitable, provided the trainees can hear the lecturer.

In the hands of an experienced lecturer, the lecture is adaptable in terms of sequence, vocabulary, illustration, etc.

It is reasonably versatile, can be used at any point in training and can quickly and easily be combined with other methods.

The following points should, however, be considered;

Communication is largely one-way, with little or no interchange between trainees and lecturers. The lecturer prepares and presents the material in his own way, and the students listen and possibly make notes.

Lectures are inappropriate for teaching skills.

A lecture has limited sense appeal which is chiefly aural. To hold a trainee's attention, the content of a lecture must be interesting and challenging.

Lecturing encourages passivity. It is difficult to retain a student's attention and is highly susceptible to distraction.

It is not easy to gauge reaction in the lecture situation. Effective lecturing is a highly skilled task. Because student interest and attention has to be generated by the lecturer, the latter's vocabulary, enthusiasm, planning, speech, techniques, class sensitivity, etc. are all critical.

THE DEMONSTRATION

In essence, a demonstration shows someone how something is done or how something works. Some of its more important applications illustrate:

Manipulative operations and procedures.

Functioning and operations of equipment.

Standards (workmanship, operating efficiency, etc.)

Safety procedures.

A well-conducted demonstration has several advantages in that it:

Has dramatic appeal which can arouse interest and sustain attention.

Provides perspective by showing the steps in a procedure.

Reduces waste and damage by illustrating the correct handling of equipment, etc.

Saves time by reducing explanation and preventing misunderstanding.

The only limit is the ability of everyone to see the demonstration, although the use of CCTV has largely overcome this limitation. A demonstration must work, and work well; it should set a standard of performance and all procedures must be correct. With these provisos, a demonstration has few disadvantages, apart from the necessity of meticulous preparation by the instructor and the choice of the appropriate room and equipment.

PRACTICE

Practice can be defined as a method in which the trainee has to perform the operation or procedure being taught, under controlled conditions. There are four basic categories:

1. Independent practice, in which trainees set their own pace and work individually.
2. Controlled practice, in which trainees work together at a pace set by the instructor.
3. Team performance, which involves a group of trainees performing together as a team.
4. Coach and pupil, which is a method requiring paired trainees who perform alternately as student and instructor.

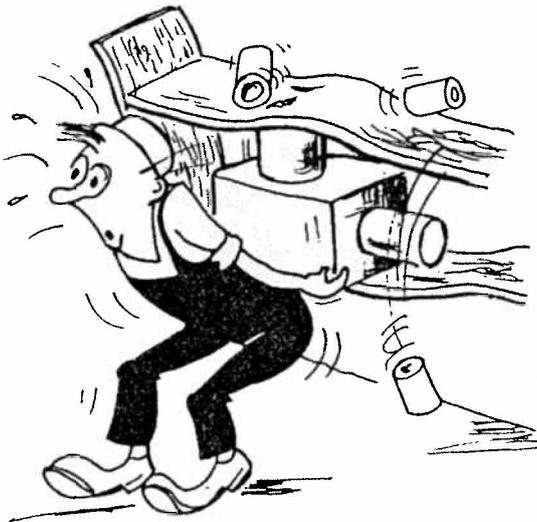


The main applications of Guided Practice are in:

- Manipulative operations and procedures.
- Functioning and operations of equipment.
- Team skills.
- Learning techniques.

Its advantages are:

The trainee is given an opportunity to apply his knowledge in a realistic situation; perhaps the best way of developing in the learner a confidence in his own ability and a positive attitude.



Maximum active participation is possible which should increase both learning and retention.

Wastage and damage is reduced by limiting the likelihood of trainee error.

The correct method of operation, etc. can be emphasised (thereby contributing to accident prevention).

A method of validation is provided. The instructor can observe whether the desired objective has been attained, and can pinpoint difficulties and locate weaknesses in instruction.

The disadvantages of the method lie in the demands it makes on equipment and tools; the output lost in using a production machine for the training function; the amount of preparation required; the time it consumes; and the large number of qualified instructors needed for supervision, appraisal, etc.

THE DISCUSSION METHOD

This method uses group discussion techniques to attain instructional objectives. Discussion methods are often classified into three categories: directed discussions, developmental discussion and problem solving discussion.

In a directed discussion, the object is to assist trainees to acquire a better understanding and the ability to apply known facts, principles, concepts, policies and procedures, and to provide students with an opportunity of applying this knowledge. The instructor attempts to guide the discussion so that the facts, principles, concepts, procedures, etc. are clearly interlinked and applied.

The object of a developmental discussion is to pool the knowledge and past experience of the students to develop improved or better stated principles, concepts, policies, and procedures. Topics for developmental discussion are less likely to have clear-cut answers than those used in directed

discussion. The instructor's task is to elicit contributions from members of the group, based on past experience and bearing on the topic in hand; he should aim for balanced participation.



The problem-solving discussion attempts to discover an answer to a question or a solution to a problem. There is no known best or correct solution, the instructor uses the discussion to find an acceptable solution. The instructor's basic functions are to define the problem as he understands it, and to encourage free and full participation in a discussion whose goals include:

Identifying the real problem.

Assembling and analysing data.

Formulating and testing hypotheses.

Determining and evaluating possible courses of action.

Arriving at conclusions, and making recommendations to support those conclusions.



Discussion methods are often neglected but they are invaluable in that the instructional goal can be more easily attained by contributions from the student's own experiences and/or specialised abilities. Some of their more important uses are:

Developing imaginative solutions to problems.

Stimulating interest and constructive thought, and ensuring trainee participation in situations which would otherwise permit passivity.

Emphasising principal teaching points.

Supplementing readings, lectures, exercises, etc.

Determining the degree of student comprehension of concepts and principles, and student readiness for progression.

Preparing students for application of theoretical work to particular situations.

Summarising, classifying or reviewing.



Preparing students for future instruction.

Determining student progress and the effectiveness or otherwise of previous instruction.



The following are the major benefits of discussion methods:

Discussions present the stimulating opportunity both to express one's own opinions and to hear those of others. In a well-planned and skilfully directed discussion, interest level is remarkably high.

Students actively participate in the development of the instruction and, therefore, are more likely to accept the validity and importance of the content, and are more deeply committed to decisions or solutions than they would be if the subject matter were simply presented to them.



The instructor is allowed to make use of the students' experience, knowledge and abilities to the benefit of everyone in the group.

Discussions demand a very high degree of student participation, and should lead to better learning and retention. Learning is said to take place in direct proportion to the amount of individual participation in the discussion.

Some of the limitations of discussion methods are:

The instructor must remain unobtrusive and yet lead the discussion. He must be well informed. He must be able to reduce arguments over trivia, prevent domination by a few students, relate comments to previous discussions, summarise, encourage full participation, etc.

The quality of a discussion depends directly on the thoroughness of the preparation, yet little or no control can be exercised over the preparatory work of the students.

Discussions are only applicable to certain forms of subject matter; manipulative skills and procedures are not really discussion topics.

Discussions demand a large time allocation. The amount of time required is frequently the decisive factor in eliminating a discussion approach.

Discussions are only effective with relatively small groups; Otherwise worthwhile individual participation is not possible.

The group has to be carefully selected if maximum benefit is to be gained from a discussion.

ASSIGNMENT

In the assignment method the student is assigned readings, problems, projects and exercises. It involves allocation of a task with directions for its completion. Assignments have two basic forms:

1. Independent study in which the student carries out the assignment on his own without direct guidance or assistance from an instructor.
2. Supervised study in which an instructor is available to provide assistance or guidance while the student is engaged with his assignment.



Assignments can usefully be employed as:

Information gathering.

Advance study.

Provision for individual differences in ability and experience.

A review of work done in class or to provide the practice necessary for development of diagnostic abilities, etc.

Study assignments have several benefits over other instructional methods as they:

Allow for a far greater and more detailed coverage of material.

Can reduce classroom time; also, by providing a common foundation of knowledge, they can make demonstrations, discussions and lectures more productive and meaningful.

Can be devised to employ the experience, special abilities or interest of students.

Can reduce the dangers inherent in exposure only to the instructor's interpretation by referring trainees to original sources.

There are four main limitations to the Assignment Method; these are:

1. Successful assignments must be planned and allocated in such a way that the objectives are clear, and strong motivation is present; the instructor must also later ensure that the assignment has been carried out.
2. Evaluation of the effectiveness of study assignments presents problems. In addition, it is difficult to pinpoint weaknesses.
3. In the development of a skill, it is essential that practice exactly follows the correct mode. The danger of the independent practice lies in the possibility of practising an incorrect procedure or error, which would involve a grave expenditure of time and effort 'unlearning' the incorrect skill and relearning the correct one.
4. If a standardisation of learning is required, study assignments may well be inappropriate for varying degrees of learning.

See appendix A.

THE TUTORIAL METHOD (AND COACHING)

Tutoring (coaching) is usually defined as a method of instruction in which the instructor works directly with an individual student. It may involve exposition, demonstration, coaching, questioning, guided practice, or any combination of these.



The benefits of tutorial methods stem from the one-to-one teacher-student ratio; they are:

A competent instructor can diagnose the needs of the individual student, and tailor the instruction to meet his particular needs.

The tutorial setting permits the highest degree of student participation and the highest degree of instructor efficiency.

The close control made possible by the one-to-one instructor-student ratio when hazardous operations are involved, helps to limit the chances of injury to trainee operators and damage to valuable equipment.

The limitations of the Tutorial Method are that it is:



An extremely demanding form of instruction, which requires complete mastery of subject matter and great skill in the diagnosis and remedy of learning difficulties.

Expensive; although only one student is being instructed, preparation and presentation time are at least the same as they would be for a large class.

THE SEMINAR/WORKSHOP



The seminar may be defined as a tutorial method which involves an instructor and a group, rather than an instructor and an individual student. (An alternative use of the term refers to a short course or conference which makes extensive use of participative methods devoted to the exclusive study of a single subject).

The seminar is generally used to:

Provide guidance for a group involved in advanced study.

Develop new and imaginative solutions to problems being studied by a group.

Exchange information on approaches and techniques being examined by members of a study group.

The following are among the advantages claimed for the seminar:



A high degree of rapport and motivation is normally achieved in the quest for solutions to common problems.

The seminar stimulates active participation.

Like the tutorial, the seminar allows adaptive instruction; a competent instructor can tailor his discussion and guidance to fit the needs of the student group.

As would be expected the disadvantages of the seminar resemble those of the tutorial in that:

It requires highly skilled instructors with a complete mastery of the subject matter.

It is usually very difficult to validate results in terms of individual achievement.

THE LESSON

A method of instruction in which the material to be presented is structured to ensure the participation of the learning group. This is usually achieved by the use of the question-and-answer technique which gives the instructor the necessary feedback to enable him to ascertain whether the material is being assimilated and, where necessary, to take appropriate remedial action.

The lesson as taught in courses on instructional techniques is probably best regarded as a format into which are fitted combinations of other methods as appropriate. There is a separate format for the two main categories of lesson, classroom (theory) and skills (practical), which are described in the following paragraphs:

The theory lesson

The theory lesson comprises three main components:

1. Introduction

The introduction serves to arouse the interest of the student and focus his attention on the subject matter. It should provide a motive and postulate a need for learning; it should list the objectives and should lead smoothly into the expositional component of the lesson - the development.

2. Development

The development is the teaching phase of the lesson. It should aim to present the subject matter in the form most easily absorbed and retained by the student, hence the heavy emphasis on participation. Student participation is usually achieved by question-and-answer techniques.

3. Conclusion

The ingredients of the conclusion are designed to test recall of the facts and application of the principles presented in the development. The two major elements of the conclusion are:

i. Recapitulation - which is concerned with recall (in a lengthy development, incidental recapitulation is also postulated).

ii Application - which, as its name implies, involves the application of the principles and procedures taught.

Allowance is also made in the conclusion for answering student queries, for providing references and for indicating future lines of instruction.



THE SKILLS LESSON

The skills lesson relies heavily on demonstration and performance, but its plan bears resemblances to that of the theory lesson.

1. Introduction

The introduction has the same functions as the theory lesson.

2. Development

The development is a demonstration carrying out the whole procedure step by step in the correct job sequence.

3. Conclusion

Conclusion is possibly a mis-nomer, for in the skills lesson it usually is the main part of the lesson. The two main elements of the conclusion are:

- i Recapitulation - which takes the form of a second demonstration.
- ii Application - which involves student performance, practice of the skills under supervision and appraisal of the student's work.

Uses of the Lesson

The lesson is basically a compromise method attempting to reconcile the requirements of lecturing with the need for worthwhile student participation. The uses of the lesson are almost all-embracing, since ingredients for most instructional situations can be fitted into its format.

Advantages

The advantages of the lesson are:

The lesson encourages class participation and, therefore, both quantity of learning and retention.

The amount of material learnt and understood is checked.

There is close co-operation between instructor and students in the build-up of the lesson.

Lesson structure is particularly suitable for instruction in practical skills.

Like the lecture, the lesson is adaptable and adjustable in terms of sequence, vocabulary and illustration, to the level and experience of the students and to the facilities available.



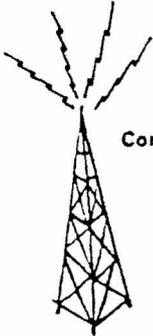
Ambition



Content and sequence are under the control of the instructor.

Because of its nature - a combination of methods as appropriate - a lesson is extremely versatile.

Communications



The structure of the lesson, with its fixed sequence of ingredients, makes it particularly suitable for use by novice instructors; it is also probably the best basic method to use in training instructors.



Disadvantages

Judgement

Because of its nature and adaptability the disadvantages of the lesson method are few, however:



full use of the lesson method is possible only with small groups,

Personal Appearance



the students have to keep pace with the instructor; in practice, this generally means that instruction is aimed at the least able student,

Believability

'coverage' of material is limited, and so the lesson method is unsuitable where instructional objectives include a general overview of a topic in a limited time.



Conviction



Good Manners

ROLE PLAYING/SIMULATION

Role-playing/simulation techniques increase student involvement in the learning process by introducing a realistic element into instruction. They all present the students with a situation which they have to resolve by acting out the roles of those concerned in the situation. There are a few particular simulation techniques which are worthy of a brief description:

In Tray exercises



In-tray exercises are a form of role-playing in which each student acts the part of, say, an executive faced with an in-tray containing a number of letters, memoranda, files, etc., usually to be actioned within a certain time limit. In-tray exercises can effectively be made part of a larger simulation; telephone calls and interruptions by visitors, etc., are often added or, another common elaboration, a group of individuals each with different in-trays and varied functions operate within a simulated organisation.

Case studies

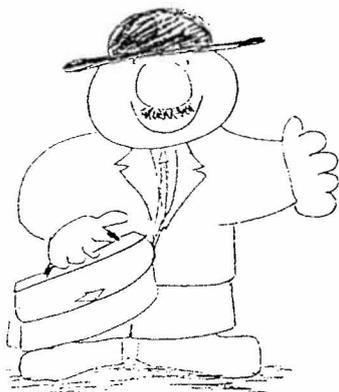
Case studies comprise problem situations which are presented to a group of students; the group has to find the best solution. The situation may be presented in many ways; video tapes and sound tapes are all being increasingly used for this purpose. Group solutions usually have to be presented as a written report with an oral explanation.

Management games

Management games differ from other role-playing techniques in that they are played to rules laid down before the game starts. The students are given management titles and make management decisions, using a model of the real situation. These games are competitive and usually enjoyable. However, their competitive nature and the implied criticism of the 'losers' tend to introduce unnatural reactions in the participants.

Uses of simulation techniques

The uses of simulation techniques vary with the technique employed, but they are generally most often applied to:



Give trainees practice in the application of job skills/knowledge in safe, controlled conditions.

Isolate part of a task and give special training in that part.

Teach action as a member of a team.

Introduce interest and active participation in what otherwise might be boring or routine instruction.

Benefits

These vary according to the technique used, but simulation can add, through the high degree of commitment of participants, an extra interest and motivation to the basic instructional method employed.

Limitations

These also vary with the technique used. In addition, simulations involve a great deal of preparation.



TEAM TEACHING

Team teaching is a system which employs instructors as a team. One of the instructors acts as leader, and the others, representing a whole range of abilities and subject expertise, plan, conduct and evaluate in concert all learning activities for a comparatively large student group. The entire group may be instructed simultaneously or split into smaller groups, as necessary.

There are virtually no limits to the uses of team teaching; it can be used for most instructional purposes. However, it does have three particular applications:

to cope efficiently with large student groups.

to make maximum use of available instructor expertise.

to deal with individual differences of ability, achievement, aptitude, educational level, prior training and experience within the student population.

The following are among the advantages of team teaching:

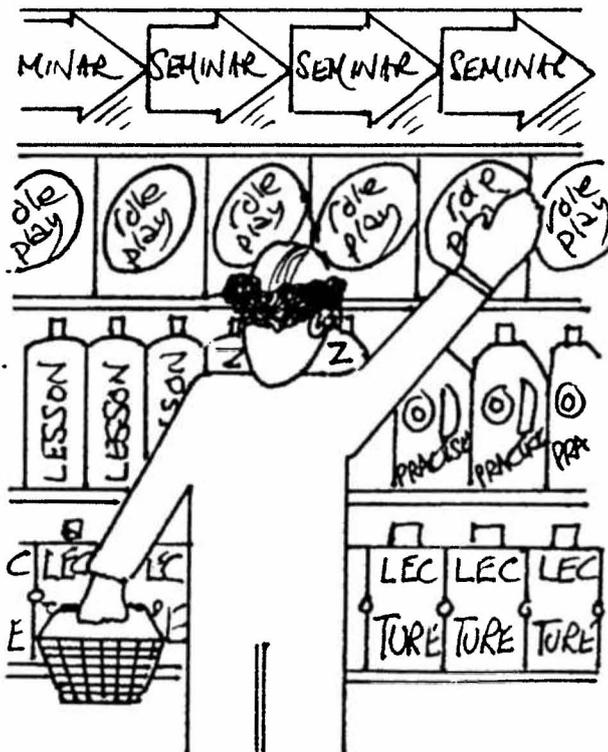


Instruction is by the instructor best qualified; use is made of the best method for attaining the objective; attention to individual differences and increased opportunity for student participation are made possible by the co-operative planning of a team, with resultant improvement in the effectiveness of instruction.

Team teaching makes possible maximum utilisation of instructional expertise and, therefore, promotes efficiency. For instance, routine administrative and teaching tasks can be carried out by the less skilled members of the team, while the more demanding duties are assigned to the best instructors.

The disadvantages of team teaching lie in the amount of time required for planning and co-ordinating the team's activities, the degree of teamwork involved and the special training required.

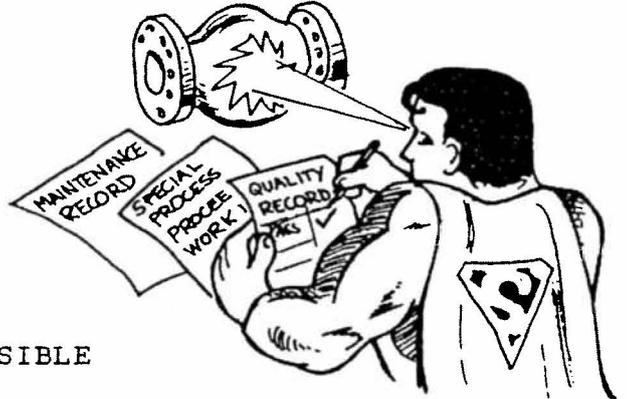
This chapter has attempted to describe some of the principle methods of instruction, but it must always be borne in mind that the trainee will only learn if he 'wants to'.



HOW DO PEOPLE LEARN?

HOW: The senses

It has been established that the five senses contribute to the learning process in approximately the following order:



SIGHT	75%	VISIBLE
HEARING	13%	AUDIBLE
FEELING	6%	TACTILE
SMELL	3%	OLFACTORY
TASTE	3%	GUSTATORY

Each instructional session should therefore be planned to appeal to as many of these senses as possible.

The mechanics of learning may be summarised as the five senses leading to memory capable of recall. There are at least two kinds of memory - viz:

Rote Memory

This is essentially related to habit. By constant repetition, an action pattern is built up and committed to memory which can be retained for long periods.

Pure Memory

This works on the principle that anything which is logical, rational and intelligible can be understood. It is the thought or idea which is remembered, not the verbal clothing.

COMMITTAL TO MEMORY

Repetition is very effective in committing to memory, but there will be problems in a situation where students make as many right as wrong attempts. Any activity which is associated with success, satisfaction or triumph will be stamped into the memory.



SIGHT 75% HEARING 13% FEEL 6% SMELL 3% TASTE 3%

REGENCY AND FREQUENCY

It is a fact that we remember recent material rather than remote cases, and repeated material rather than single examples: but there are exceptions. For example, emotional experience plays a great part in learning (often with adverse results).

PERSEVERANCE

The tendency to persevere may be induced by repetition and the other factors of memory.

ASSOCIATION OF IDEAS

Aristotle noted that events experienced together are recalled together; the association of ideas is the basis of mnemonics, but DO NOT OVERDO THE USE OF MNEMONICS.

IMAGERY

In adults, there seem to be two kinds of images:

- i Primary mental images of recent effects that may need reinforcing.
- ii Normal mental images, which are the picturing by the various senses of material that facilitates remembering.

RELEARNING AND OVERLEARNING

Material once learnt, even when apparently forgotten, can be relearnt in much shorter time than the original learning took. Matter which is to be recalled as a matter of routine should be overlearnt - i.e. learnt after it appears to be known.

RETENTION AND RECALL

Retention decreases with the passage of time. Forgetting is due to:

- disuse;
- imperfect learning;
- interference from new learning.

(When attempting to recall forgotten material, concentrate for a short time only. Once the effort is set up, the process goes on. Well-organised and well-associated material is most easily recalled).

LEARNING SKILLS; KINAESTHETIC ABILITY

This is the sense which provides 'information' about the position of our limbs and the pressure which we are exerting with them.



Kinaesthetic ability varies considerably, being highly developed in such activities as touch typing, telephone switchboard operation, handling a skiving knife, etc.

WHY PEOPLE LEARN

Some of the reasons for learning are:

- Curiosity
- Self preservation
- Self betterment
- Need of responsibility
- Saving time and effort
- Pride of craft or skill
- Sense of achievement



Motivation

A popular misuse of the term is included in the phrase 'to motivate someone'. 'Motive' means that which moves a person or thing. There is no such thing as an external motive; all motives are internal and are inducements accepted by the mind of the person who acts. You may successfully stimulate a person to adopt a particular motive, but you do not and cannot motivate him.

The desire to please, ambition, promotion and other reasons can all become stimulants for motives.

From this, it follows that the instructor needs to know enough of human nature and the individual to be able to assess possible motive stimulants. He will need to have the qualities of sympathy, friendship and understanding.

GENERAL PRINCIPLES FOR INSTRUCTORS

Honesty

Trainees need to trust your integrity and your appreciation of their needs. They believe you have faith in what you teach.

Always admit any lack of knowledge! - 'I don't know, but I will find out for you!!'

Remember that the instructor is merely a leader amongst equals, and his authority stems from his knowledge of the subject. His ability to impart some item of knowledge does not make him superior.

SYMPATHY AND TOLERANCE

These may be linked to patience. It is not necessary to be a placid type, but every craftsman has patience as part of his professionalism. Trainees are ordinary human beings; they are fallible and different. It may be necessary to give some more attention than others, but the instructor has a duty to all.

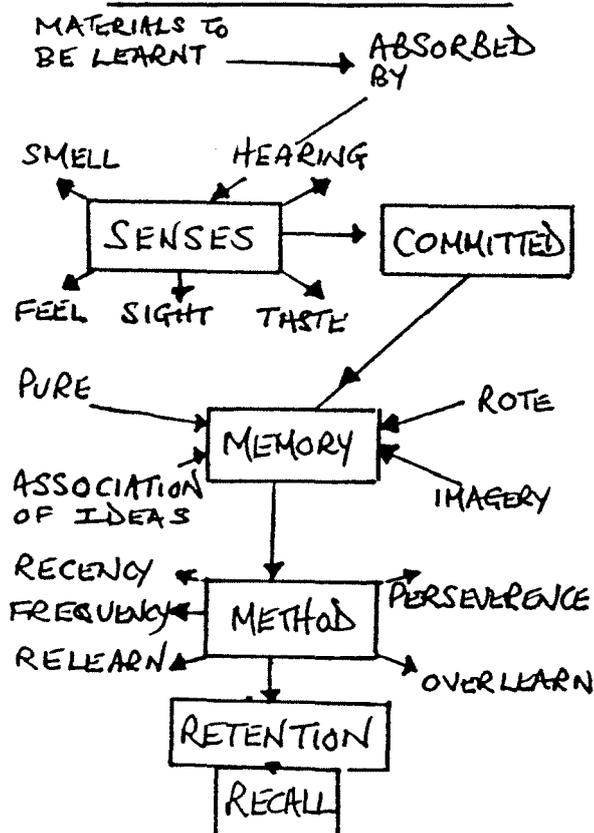
HUMILITY

A good instructor is confident but not 'cocky'. He may be wrong, and must be prepared to admit it when he is.

It is an instructor's job to impart facts and not impose opinions.

Remember the:-

MECHANICS OF LEARNING



KNOWLEDGE

An instructor must be competent but not necessarily encyclopaedic. He must be familiar with what should be known well. The worst position he can be in, is to be only one step ahead of the group.

ENTHUSIASM AND SINCERITY

If the instructor appears to be enjoying teaching his skills to others, they will be interested enough to learn from what he is doing. A listless, offhand presentation will not commend itself, but this does not mean that he should overplay his part. Enthusiasm for his subject is essential and should be natural.

CLARITY AND SIMPLICITY

A strong accent is no bar to good instruction, but speech should be clear and precise. Jargon and flowery phrases should be avoided.

Go - rather than proceed.
Stop - rather than terminate.
Ask - rather than request.

The everyday jargon of the instructor's job may well be confusing to a newcomer, and excessive use of jargon may well open the instructor to ridicule.

SUGGESTIONS FOR THE INSTRUCTOR



- * Avoid disparagement
- * Be confident
- * Know your subject
- * Prepare each lesson as if for the first time.
- * Avoid flippancy
- * Refer to trainees by name
- * Never be afraid to say, 'I don't know'.

INSTRUCTION - Preparing Giving Testing

PREPARING

Preparation is the foundation on which good instruction is built. Preparation will require **TIME**, which is often limited. To make the best use of the time available, the process of preparation must be logical and systematic.

FACTORS TO BE CONSIDERED

The Aim

The instructor must first decide the aim of the instruction, if this has not already been stated by someone else. This is often the most difficult factor to get right. The aim should reflect the purpose of the instruction, e.g. the aim of this course is to enable managers to be better able to fulfil their responsibility for safety.

The Objectives

A quantified statement of the session's objectives expressed in behavioural terms.

Objectives must be **DEFINITE**, **LIMITED**, **SIMPLE** and, above all, **PRACTICABLE**, e.g. the objective of this training is that, by the completion of this session, trainees will be able to list the main requirements of Section 2 of the Health and Safety At Work Etc. Act 1974.

The Time

How long is the period?

The Group

How many trainees are there?

What do they know about the subject already?

How quickly can they learn?



Subject Matter



The instructor must know his subject. He should select the main subject headings and then list the various facts and skills to be taught under each heading.

Ways of Presentation

The subject matter will help to suggest different methods of presentation, e.g. lesson, lecture, demonstration, discussion, etc. - and the instructor must decide which is the most suitable.

Aids

Good instructional aids help the trainee to understand. The instructor must consider what will be needed, and his choice of aids may affect the method of presentation.



Conditions

The instructor should consider what will be needed - e.g. blackout facilities for films, desks for taking notes, work benches, etc - and how they can be made as effective as possible. The instructor should prepare a check-list of all the visual aids etc. he will require.

SUBJECT MATTER

SUBJECT MATTER must be developed.

Work on the basis of:

MUST KNOW - Vital basic information which must be taught.

SHOULD KNOW - Important information, as much as possible of which should be taught.

NICE TO KNOW - Background information of general interest which is nice to teach, if time permits.

Logical Order

Arrange the subject matter in a logical order, so that the instruction will be progressive. Trainees will tend to progress from the KNOWN to the UNKNOWN.

Work out stages

Group the various subject headings into easily-digested portions (most lesson should divide into about three or four stages).

THE PLAN (see Appendix II)

Now the actual plan can be prepared. It should consist of:

- (a) Instructor's Check List -
 - The subject
 - The lesson
 - Time and place
 - Information references
 - Visual aids - including lists of slides, etc.
 - Projection equipment needed
 - Stationery, etc.

- (b) Beginning (designed to promote interest)
 - Preliminaries: state title and purpose.

Revision: to get everyone tuned in.

Introduction: the AIM
the REASON WHY
the INCENTIVE (if any).

- (c) Middle
 - Teach in stages, and consolidate each stage with:

Questions FROM the group to clear up doubts.

Questions TO the group to confirm what they have learned.

A summary of the main points covered in the stage.

- (d) End
 - Questions FROM: Questions TO:
 - Summary - all covering the whole lesson.

LOOK FORWARD to the next session (if any) to arouse their interest.



PRACTICAL TESTS

One problem is to prevent trainees from queuing up and waiting their turn. A method of overcoming this consists of a series of benches at which each individual (or small group) is tested in a specific thing and then moves to the next bench. The time spent at each must be the same for all.

ORAL TESTS

These can either consist of a series of questions put by the instructor, or they can be run on the lines of a quiz. The latter is normally the more interesting method. When setting a quiz, interest is increased if rival teams are each asked to frame a set of questions which must be checked by the instructor before the quiz takes place.

WRITTEN TESTS

Two types:

- i Long written answers.
- ii Short answers.

Long written answers

These are of value in academic instruction, but are not usually suitable for normal instruction. To be successful, they depend to a large degree on the powers of expression of the person being examined. They also take a great deal of time and experience to set and correct.

Short answer tests

- Require no powers of expression.
- Are easy to correct, mark and run.
- Are simple to understand.

Examples:

One word answer - A question or short problem is followed by a blank space in which the answer has to be written. For example

Write answer here

- (a) What is the substance of leather shown as?.....
- (b) What is the backer for PUCF known as?.....
etc.

Points to note:

- Restrict answers to one or two words only.
- There must be only ONE correct answer.

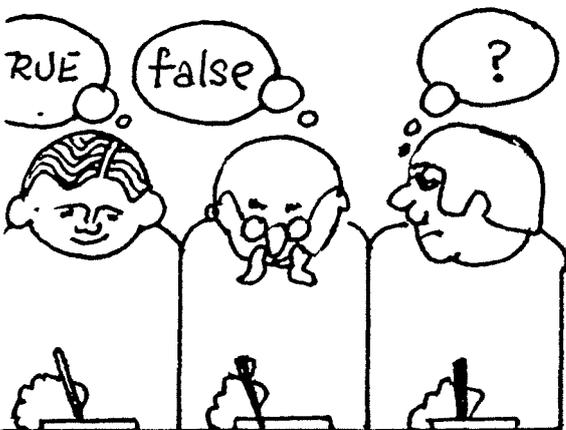
Completing a statement - A statement is shown in which the missing word(s) has (have) to be filled in.

For example:

- (a) polymerisation is completed when.....takes place in the presence of..... as a catalyst.
- (b) Raw skins are put in a l..... s.....to s.....the grain and loosen the h.....f.....

True or false

A series of statements are written, some of which are true and others false. If the statement is considered true, a T is placed in the blank space opposite the question; if considered false, an F is marked in.



Points to note:

It is only suitable for revision tests, as trainees may guess about 50% of the answers.

This test must be followed by a discussion of the answers.

A better method is where an incomplete statement is followed by a number of comments, some of which are true and some false.

For example:

Toluene is:

A a dark brown solid	F
B a colourless volatile liquid	T
C immiscible with water	T
D a good organic solvent	T

Note: Any number of comments (which must be sensible and not obviously wrong) may follow the incomplete statement. The test is much more reliable than ordinary true or false tests.

Multiple choice - An incomplete statement is followed by a number of answers, only one of which is correct. For example:

How many bones in a human foot?

- a) 23
- b) 24
- c) 25
- d) 26

Answer: (d)

Points to note:

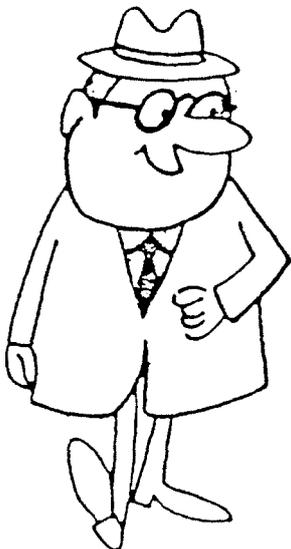
No answer should appear which is obviously wrong.

Trick questions must be avoided.

There should be between four and six alternative answers to each question, and about 50 questions.

Avoid clues to the correct answer.

Separate answer sheets are advisable to save spoiling the question paper. Answer sheets may be quickly checked by use of a stencil marked with the correct answer.



REVISION

The aim of revision is to maintain a standard already reached. To do this it may often be necessary to reteach certain subjects or parts of a subject.

As instruction will already have been received in the subject, every effort must be made to avoid boredom. This can be achieved by:

A fresh approach to the subject and tackling the subject in a new way. Ensuring that revision is progressive and that the trainees feel a sense of progress.

Keeping revision practical.

Giving revision periods the same careful preparation as a basic instructional period.

To ensure revision is progressive and to avoid needless repetition, a suggested sequence is:

Test at the start - to find the standard.

Practice - on the weak points disclosed by the test.

Competition - a final test on the whole subject.

SUMMARY OF THE PRINCIPLES FOR GOOD INSTRUCTION

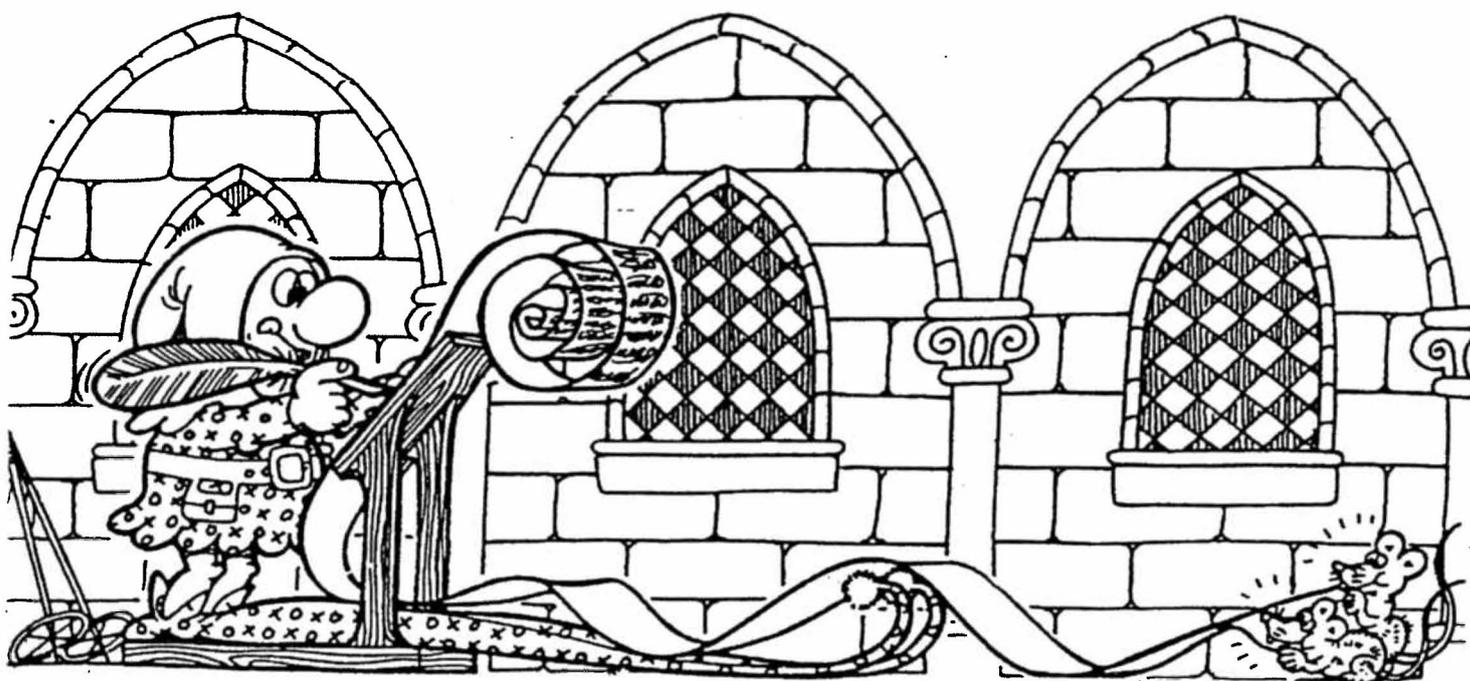
Preparation will vary according to the type of instructional period. Whatever the period, the Instructor must:

1. Know the subject matter.
2. Decide the best way for the trainees to learn.
3. Thoroughly prepare the instruction.
4. Aim at the maximum:

interest
activity.

5. Test each stage.
6. Make revision period:

progressive.
interesting.
practical.



THE USE OF QUESTIONS IN INSTRUCTION

The proper use of questioning is a technique which must be acquired. The rules are straightforward and, coupled with a comprehensive knowledge of the subject, enable the instructor to keep students active and alert.

To apply the technique effectively, the instructor must understand:

- the purpose of questions in instruction;
- how to put questions to the group;
- how to deal with questions from the group.

PURPOSE OF QUESTIONS

Questions:

TEST by checking the knowledge of the group.

TEACH by making the group work out the answers for themselves.

ACHIEVE ACTIVITY by keeping the group mentally alert.



A question can also be used to 'stretch' a person by making him apply something he has said to a new area - i.e. it develops his thinking.

HOW TO PUT QUESTIONS

This is important:

Put the question to the whole group. Pause so that the whole group has to think.

Name the person who is to give the answer.

Comment on the answer - ask another trainee if the answer is correct.

Praise a correct answer. Handle wrong ones sympathetically.

QUESTION - PAUSE - NAME - REACT

Four simple rules:

No ambiguity. Make sure the question is clearly understood.

Don't ask questions to which the answer is of the Yes or No variety - it only encourages guessing.

No questions for skills. Don't ask questions to test physical skills. The only true test of a skill is a performance test.

No powers of expression. Don't except deliberately, ask questions which test powers of expression. It is often unfair and sometimes embarrassing.



QUESTIONS FROM THE GROUP

Questions to the instructor from his students fall into three categories:

Relevant
Irrelevant
Instructor does not know the answer.

Relevant questions

If the question covers a point already taught, put it back to the group. This checks whether the point was missed generally. It may show up a weakness in the instruction. In any case, it helps group activity. If the question deals with a point which will be covered later, it is usually better to tell the student this, and when the point is reached, check back with him that his question has been satisfactorily answered.



Irrelevant questions

If the question is genuine, the instructor should deal with it constructively but briefly. Give encouragement, but don't waste time. If the question is a deliberate attempt to mislead, deal with it firmly.

Answer not known

Do not try to bluff it out. The bluff which fails means the group loses confidence in the instructor and it will never be regained. The instructor should admit he does not know, tell the group he will find out and tell them later; he must then do so.

SUMMARY;

GOOD QUESTIONS - Test, teach, achieve activity, develop.

METHOD - QUESTION - PAUSE
NAME - REACT

DO NOT USE - Ambiguous questions -
Yes/No questions =
skills questions -
powers of expression
questions.

SELECTION OF VISUAL AIDS

INTRODUCTION

Psychologists have shown that in the teaching of theoretical skills, 75% of what is learned is learned via sight. They have also shown that in the teaching of practical skills at least 25% is learned through sight, and that the bulk of learning in a practical skill is naturally through the sense of touch.

The following principles are worthy of careful consideration before producing any visual aid:

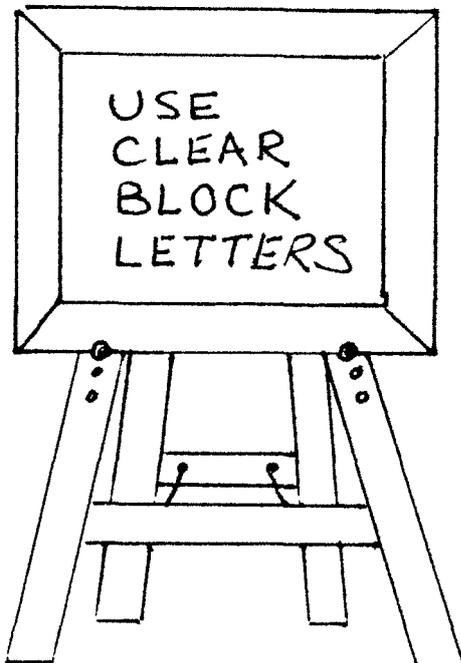
Size - The aid must be large enough to be seen by the whole audience, and its size correlated with the real thing.

Colour - Colour should be used, but used wisely. Essentially, colour should differentiate one part of the aid from another. Colours should not clash, nor should too much colour be used. If two aids are used and they are related, colours must be correlated.

Lettering - This must be neat, bold and clearly readable by all. Letters should be approximately one inch high. The labelling should be written in black ink on a white surface; coloured labelling tends to confuse. The writing should be arranged to allow plenty of lateral spacing. An aid should never be over-labelled.

Number of aids - Where possible, the instructor should try to use one type of aid for one lesson. Where necessity demands more than one, careful rehearsal is recommended beforehand to ensure a smooth presentation.

Value - All aids must assist the instructor, but they must be subservient to him. At all times, the instructor must be in complete control.



BASIC VISUAL AIDS

CHALKBOARD TECHNIQUES

The chalkboard is still the only universally available teaching aid. It is not used to the limits of its potential, and it is still unsurpassed for many purposes in the classroom or workshop. It is unpopular with many instructors because its proper use requires the acquisition of skills which require application and considerable practice.

Write clearly and distinctly, and whenever possible use block letters at least one inch high. Keep all writing horizontal. Use colours sparingly. The use of dustless chalk is recommended. Avoid breathing in chalk dust as it can be very dangerous to health.

White boards, made of plastic, are also very useful. Use grease-pencils or felt-tipped pens. As with blackboards, make all writing clear and easy to see. Where a solvent has to be used for cleaning, avoid breathing the vapours.

Remember - When writing on a chalk-board your back is turned towards the audience; do not, therefore, start 'talking to the chalkboard'.

MAGNETIC BLACKBOARDS

As the surface of the mild steel sheet is painted matt black, the board serves as a blackboard and a magnetic board. Outlines, inter-connections, etc. can be drawn in chalk, and easily removed. Diagrams can, therefore, be built up and parts which have to move can be backed with magnets.

Magnets

The flat disc magnet should be fastened to card, etc. Always use plenty of magnets. For the larger displays, magnetic strip can be used. The strip can be cut with scissors.

PLASTIGRAPH

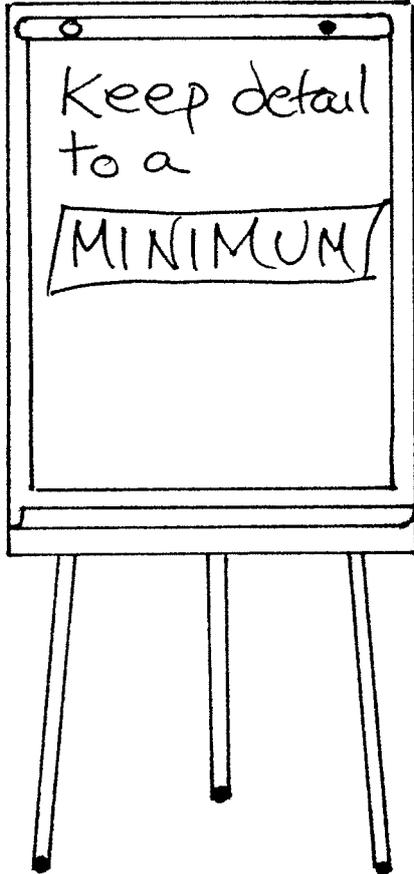
The plastigraph board is a combined magnetic and plastic board. The mild steel surface is covered with a sheet of PVC material to which pieces of plastic can be stuck. The materials used with this board are:

PVC sheet ('Plastigraph') - This comes in various bright colours, and can be cut quite easily. It is placed on the board and rubbed gently to push out creases and air bubbles. Large pieces of plastic are more difficult to fix, so, if possible, they should be put into position beforehand. As the plastic sheets will stick to each other it is possible to build up diagrams, using overlays. The material is indestructible and will not fade. It is difficult to write on or cut into complicated shapes.



Cardboard and magnets

As the board is also magnetic, cardboard cut-outs can be used to simulate movement, or cardboard tags can be used to label a diagram. The magnets or magnetic strip should be fastened to the cardboard with Sellotape. Because the board has a plastic surface, it should not be marked in any way. Chalk will not show on it, and chinagraph and spirit-based



FLIP CHARTS

Care should be taken to ensure that detail is kept to a minimum. Letters should be at least one inch in height. Use colours for diagrams; lettering is best if black on white surface.

MODELS

These are a substitute for the real component and are useful if the real thing is either unobtainable or too large for teaching purposes. Models must be made carefully and their size correlated with the real thing. If the original component moves, the model should also be dynamic. Colour must be used sparingly and wisely. Models can be made from many materials - e.g. cardboard, paper, metal, wood, etc. - but they must be rigid enough to withstand handling.

COMPONENTS

If available, the actual components should be used. If it is necessary to strip component, all nuts, etc. should be slackened off before the start. Components should not be passed around.

Some points to note;

There is no need always to have a very large screen - e.g. for a room approximately 10 yards by 7 yards, a screen measuring 3 feet by 2 feet would be adequate.

Front row of seats should be at least 9 feet from screen.

Check always for clear vision.

Screen should not be placed too high.

PROJECTORS

- THE SLIDE PROJECTOR (slide and film strip).

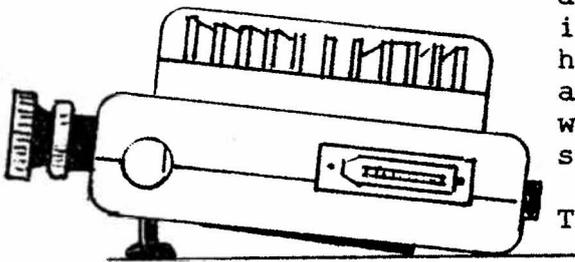
The equipment usually consists of 35mm slide and film strip carriers. The projector is adjustable for height, and the flex incorporates an on/off switch (some have a focusing switch arrangement).

The projector:
is unsuitable for use in a fully lighted
classroom, unless placed in a rear
projection cabinet.

can produce a barrier between instructor
and students, and the instructor must
frequently move to the screen to indicate
some detail. The instructor may lose
some contact with his students or his
lesson material.

AUTOMATIC 35mm SLIDE PROJECTOR

This machine also allows for remote
control by the instructor, who can
also focus by remote control. The
instructor can, therefore, pre-mount
his slides in a multi-slide carrier
and move them forwards or backwards
without losing contact with his
students.



THE OVERHEAD PROJECTOR

The overhead projector (OHP) has
existed in one form or another for
over 20 years, but for a long time
the only facility available to
instructors was writing on the
transparency stage. In recent years,
however, development in transparency
production, and an increase in size
of both the transparency stage and
the light source of the machine, has
led to a re-examination of its
potentialities as an instructional
aid.

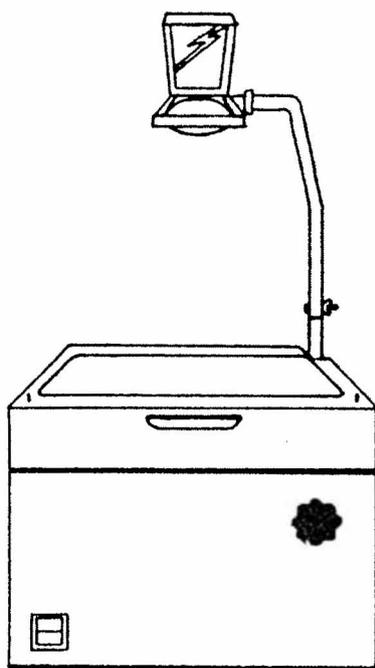
The OHP is considered by many
instructors to be the most versatile
teaching aid available. It combines
the advantages of the blackboard and
the slide and film strip projector;
it facilitates the use of dynamic or
semi-dynamic techniques usually
associated with the plastigraph;
simple experiments can be carried
out on the projection stage.



It should be clear, therefore, that
the OHP is not just another gadget to
be added to the long list of electrical
equipment presented to the instructor,
and found wanting. It is something
which is as basic and as important as
the blackboard itself, for it provides
the instructor with an opportunity to
create whatever visual illustrations
he needs for his lessons.

Principles of operation

The OHP consists of a light box with a large glass window approximately 10 inches square. Light passing through the window is focused on the screen by means of a focus wheel which controls the movement up and down a slide on the projection head. The height of the image on the screen is adjusted by slight movement of the projection head itself. A scroll attachment runs across the projection stage.



The OHP is cooled by a small fan ensuring that the working surface of the transparency stage does not over-heat. Both fan and bulb are controlled by an on/off switch on the projector; in some models the fan is controlled by a thermostatic switch.

At a distance of 8 feet from the screen, the projector will produce a screen image some 5 feet square. The further back from the screen that the projector is taken, the larger will be the picture. For most uses, however, an image of 5 feet square is adequate.

No special screen is required. A white sheet or even the wall will serve as a screen. However, if a cheap home-made screen is thought desirable, it can be made using a sheet of mild steel (about 26 gauge), cut to size and painted matt white, mounted on five-ply wood to keep it rigid, and framed if necessary. The magnetic properties of this screen can then be used to provide some animation, if needed.



A pointer can be used either on the screen or on the projection stage of the machine. If the former method is used, care should be taken not to obscure the image projected on the screen, or to come between the image and the projector. The instructor should also consider the possible loss of class contact as a result of this method. If the latter method is adopted, it is suggested that a knitting needle would provide a good pointer; the instructor must avoid the temptation to use his finger. Pointing on the transparency stage should be definite and controlled. The pointer must not be allowed to shake about.

Problems

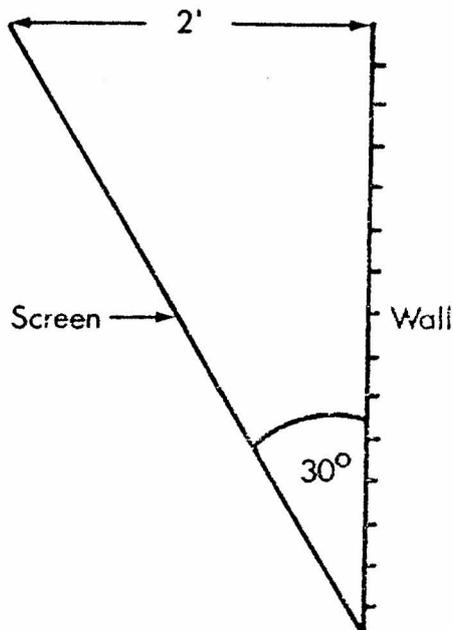
With the OHP standing on a table or desk in the centre of the classroom, and the image projected forward to a vertical screen, several problems are encountered:

The screen image is distorted (Keystone effect). The higher image is projected, the more pronounced is the distortion.

The instructor cannot avoid positioning himself between some of his students and the information on the screen, unless the image is thrown high above the instructor's head, thereby increasing distortion.

The OHP itself can prevent several students from seeing the screen easily.

It is possible to overcome these problems, however:



Distortion on the screen can be moved or minimised by angling the screen forward. With the projector standing on a conventional classroom table and positioned some 8 feet to 9 feet from the screen, it is recommended that the screen be angled forward. This can be done either by mounting the top of the screen 2 feet forward of its base position, or by hanging a portable screen forward from the top. The best position can be determined by experiment in the classroom.

Projection from the side, rather than forward, will remove any possibility that the instructor will obscure the screen from some of his students. A right-handed instructor should stand to the left of the OHP, looking at the class; hence he should project from the right-hand to the left-hand side of the classroom from the students' position. This set-up will be reversed for a left-handed instructor. Where side projection is impracticable because of the small size of the classroom and the large number of students in it, an attempt must be made to throw the image from the projector high enough on to the screen so that the students can see over the head of the instructor: but care must be taken in this case to minimise distortion.



If the OHP itself obscures student viewing, it can be set into a table so that the transparency stage of the projector is level with the top of the table.

Advantages

Visual contact

Because of the high light output of the projector, it can be used effectively in fully lit classrooms. The instructor is able to stand or sit facing his students and can be close to them. All indications can be given with a small pointer on the stage of the OHP; lessons can be developed in full visual contact with the class.



Outgrown.



Outworn.



Want new style.



Seasonal needs.



Special occasion.



Special purpose.

Transparency production

Transparencies can be produced easily, cheaply and quickly by hand or by machine. They can be prepared and produced by the instructor himself and retained for further lessons.

Flexibility

The OHP combines the functions of most visual aids. It can be used as a blackboard, magnetic or felt-board; diagrams can be built up easily stage by stage; experiments can be carried out on the transparency stage; models, both dynamic and static, can be displayed.

The following paragraphs discuss some of the ways in which the OHP can be used as an instructional aid. This account is not exhaustive and the only controlling factor would seem to be the ingenuity of the instructor using the machine.

Alternative to all forms of blackboard

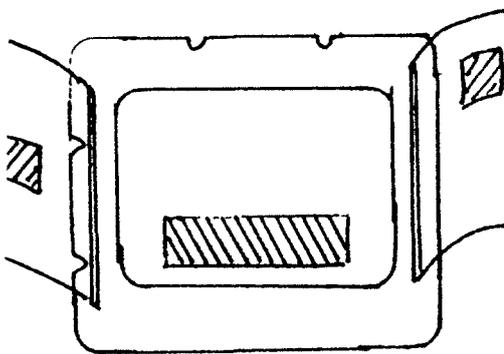
One of the problems associated with the blackboards as an instructional aid is the difficulty generally experienced by instructors in getting into the classroom to prepare the summaries or diagrams before the lesson. If such preparation is possible, there is the consequent problem of safe storage. Both these difficulties are overcome by the OHP. Sheets of acetate or transparency foil replace the blackboard, whilst the scroll attachment provides a roller board.

All these are easily transported and stored, and not only can they be prepared before the lesson but they can also be retained for future use.

In general, a moist cloth will clean the transparencies if required, and there will be no dust.

If the instructor wishes to use ordinary fountain pen and fountain pen ink to produce drawings for the OHP, triacetate sheet should be used. This is double coated and allows ordinary ink to remain stable. Coloured inks will also project. The triacetate can be cleaned in the same way as the acetate sheet - with a moist cloth. Those pens and pencils which write on acetate will also write on triacetate.

Many instructors see the OHP as a replacement for the blackboard, but caution should be exercised. The blackboard, by virtue of its size, gives the instructor the opportunity for movement and gesture, and for the inspirational diagram. However, there are many occasions when work on the blackboard is uneconomical, and attention is lost. It is on these occasions that the OHP becomes a valuable teaching aid. Furthermore, the OHP can be said to have a certain therapeutic value; the instructor who, for long periods remains fixed at the blackboard, teaching to it and not to his students, is forced to face his class and look at his students when he uses the OHP.



Care, however, should be exercised not to over-use the OHP. As with any aid, if it is used continuously it can create boredom and strain for both students and instructors.

Transparencies produced on transparency foil tend to be flimsy, and could curl up on the projection stage of the OHP. It is recommended that the transparencies be mounted in a transparency frame or pushed under the acetate scroll. Transparencies are permanent and, provided they are treated properly, should give years of service.

Overlay technique

With the OHP, diagrams can be built up stage by stage by overlaying one transparency on top of another one. Colour could be used here to good effect. The final overlay would label the whole diagram.

Using this overlay technique, the instructor can develop his lesson by question and answer from the simple to the more complex, whilst at the same time adding to his diagrams without losing any visual contact with his class.



If this technique is adopted, the transparencies should be mounted in a transparency frame. The base should be stuck firmly to the frame, and the overlays, once aligned, can be hinged

to the frame, using self-adhesive strips. Care should be taken here, however, to ensure that the overlays are hinged on the correct side or sides of the frame if side projection is being used. Up to eight overlays can be used with little noticeable loss of light on the screen.

Experiments

Many experiments can be carried out directly on the projection stage of the OHP. The following are examples:

Magnetic force: a bar magnet can be placed on the projection stage, and a sheet of acetate put over it. Iron filings can then be shaken over the magnet from a pepper pot. A slight tap on the acetate sheet will ensure that lines of magnetic force are clearly shown.

Electricity: experiments can be carried out, using a set of meters with interchangeable perspex dials. The meters can be connected to a dry-cell battery and a bridge resistor.



Chemistry: with a science table attachment, chemical experiments can be projected in colour.

Wave propagation: a perspex tank filled with water and placed on the projection stage can be used for simple ripple tank experiments. Spots of water dropped into the tank will give a clear indication of wave propagation.

Models and instruments

Working models can be made from transparent coloured perspex or from acetate sheet. The models can be built up during the lesson, and then made to work.

Perspex instruments such as protractor, set square and slide rule will project clearly when placed on the transparency stage of the OHP.

Film strip adaptor: it is possible to purchase an attachment for some projectors so that slides and film strips can be shown.

Conclusions

The OHP is a particularly versatile and flexible instructional aid, and, unlike many other electrical aids, is easy to use in the classroom. Transparencies can be produced relatively easily and retained for future use. The classroom does not have to be blacked out, and so the instructor remains in complete visual contact with his students. Furthermore, special screens are not necessarily required.

Suffice it to say, therefore, that the OHP is limited only by the imagination of the instructor using it. One factor, however, must be considered when all the transparencies and experiments have been prepared - namely, how to lay out the classroom. Unless sufficient thought is given to this, much of the value of the OHP as an aid will be lost.

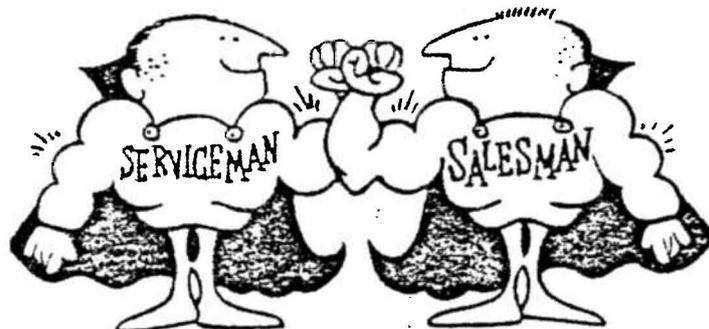
END OF LESSON

Always leave a taught group on a happy, confident note. It is important to allow a few minutes for a tidying-up session.

Time required	
	Questions to and from the group Test on vital points Revise if necessary Summarise - use of 'hand-outs' Give title, time, etc., for next lesson.

Additional work for the instructor:

- (i) Any items to avoid next time.
- (ii) Any points that helped the lesson go well.
- (iii) Were the stated objectives achieved?



STUDENT EVALUATION

Always of interest and concern to the teacher is, "have the students understood what has taken place - will they remember and be able to apply what has been taught and demonstrated?"

Some of the ways to test and measure have been discussed in this book. The individual teacher will know which will, for him, give consistent results.

Questions and discussions at the end of each subject allow the teacher and the student to measure against the standard answer.

Creating measurable standards is important in any assessment/evaluation process. In an academic environment, the standard will be established against historical information and the examination body's layed-down criteria.

It is a good idea to have standard answer sheets against which to compare individual student work. This then, brings us to marking to achieve assessment. Best current practice is to use a grading system based upon:

DISTINCTION
MERIT
PASS
REFER (FAIL) TRY AGAIN

as a rough guide:

D	90+
M	70+
P	50+
R	-50

It is necessary to keep detailed records of all student attainments and make these available to students through-out the academic year.

APPENDIX A is a suggested project assessment evaluation.

Pro forma widely used in the EC and certain other countries. Much of the information completed can be readily understood.

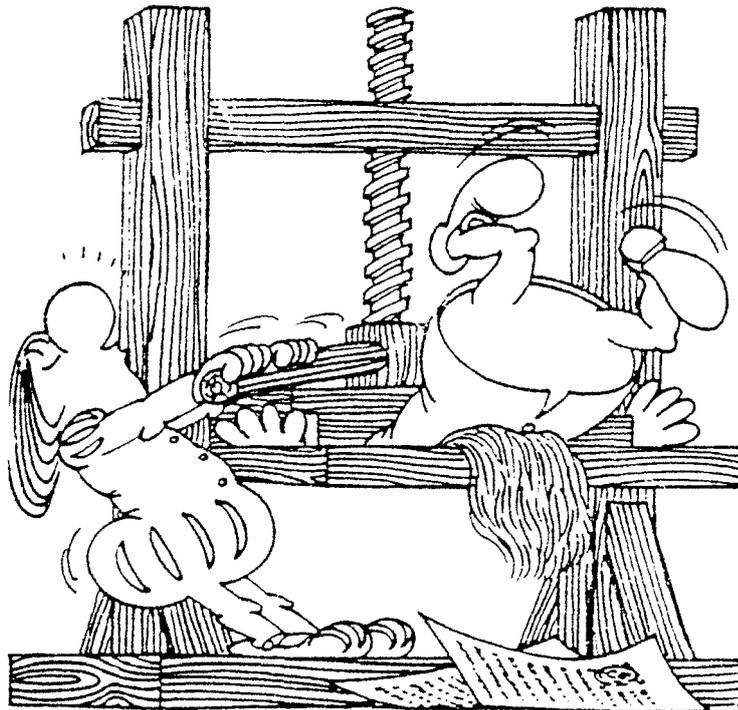
APPENDIX B is kept jointly by the teacher and the student to monitor common skills and develop a profile in non-specific subject skills. The pro forma has the advantage of keeping the student aware of his own progress and personal general development. The layout can be varied to suit particular course requirements.

APPENDIX C is the course Log Book completed by the teacher and signed by him and the student. The form encourages the student to have a greater concern for his progress and provide evidence of what has been achieved and future potential.

There are two acknowledged types of examination - one by a final written series of papers, which at best can only be representative of the whole syllabus, the other (now more widely accepted) is the modular approach of continuous assessment.

Students have to achieve laid-down standards in a number of units by various forms of assessment - written, verbal, group presentation, projects and assignments. It is common for a two-year course to have up to 32 units with a variety of 'tests' in each unit.

Finally, the evaluation process should lead to a Training Needs Analysis which demonstrates where the student's skill should be directed for further development, either in the current course or new studies. In this way we have completed the cycle and have clear evidence of what has taken place.



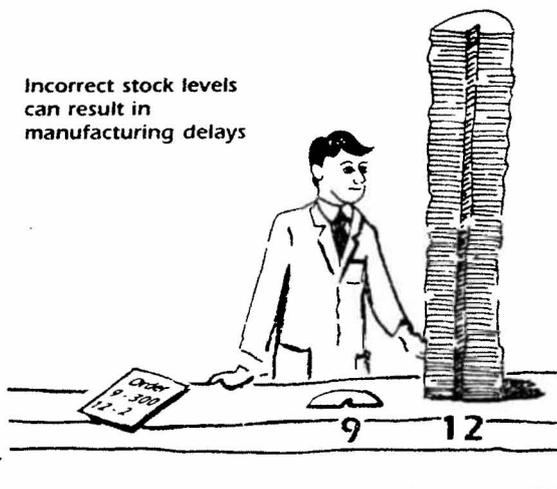
PRACTICAL TEACHING TIPS

Giving information to students should be an exciting experience as we watch people grow in knowledge and gain a more complete understanding.

Throughout this book we have focused on methods to capture students' interests and to improve their retentive knowledge. All the time we are looking for new ways to present information and ensure that it is really understood. We call this re-inforcement.

Students respond well to variety in teaching material presentation. Sometimes quiz-type questioning, the production of illustrations and group activities with the competitive element included by offering a prize or just simply by straight written answers.

Illustrations greatly help the learning process and in this book pictures and diagrams have been used to highlight a specific point.



Some suggestions for your own use are detailed in this section and relate to a variety of subject areas in order to provide the best possible student-response. The first illustration shown here can be enlarged and used as an OHP to demonstrate stock levels. The tutor can use this 'obvious' error problem to develop various approaches to ensuring adequate stocks, perpetual inventory and stock holding costs. The final statement should be that non-delivery equals disaster and possible loss of future orders!!

When teaching a fairly complex subject where you want the student to DEVELOP ideas and make comparisons, then the following question with proposed answers is an excellent method:

Question: Describe briefly the differences in properties between chrome and vegetable tanned leathers.
How are the two tannages combined and what benefits result in the finished leathers?

Suggested answer:

Characteristics of the two leathers

Chrome Leather	Vegetable Tanned Leather
Green/blue colour	fawn/brown shade
good fastness to light	poor fastness to light
good water fastness	moderate water fastness
lighter weight for a given area and substance	heavier weight
(only 5% Cr ₂ O ₃ fixed - about 75% hide substance) when fatliquored normally	30% tan fixed and about 50% hide substance.
resilient handle	More solid feel-less resilient
good shape retention when lasted, even after re-wetting more stretch (e.g. gloving)	good shape retention dry; more easily moulded wet; less stretch
more difficult to wet	more easily wetted
better damp heat resistance	poor damp heat resistance
better mould resistance	

Chrome leather is used for softer leathers, uppers, clothing where flexibility and stretch can be obtained with only moderate amounts of oil, whereas vegetable tannage gives the firmness or fulness required for bottom stock, case and bag leathers.

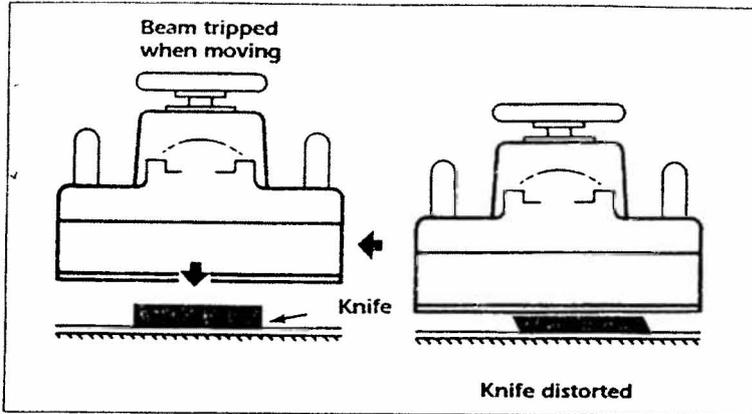
Two main combination types:

Semi-chrome vegetable tanned leather imported in this condition. It is usually stripped of some vegetable tan and then chrome tanned to give one or more of the following properties:

- (1) softer resilient handle - uppers, clothing
- (2) better water resistance - uppers, clothing
- (3) damp heat resistance - uppers/linings for modern lasting techniques
- (4) better dyeing properties (as above) - grand and suede slippers, gloving and clothing.

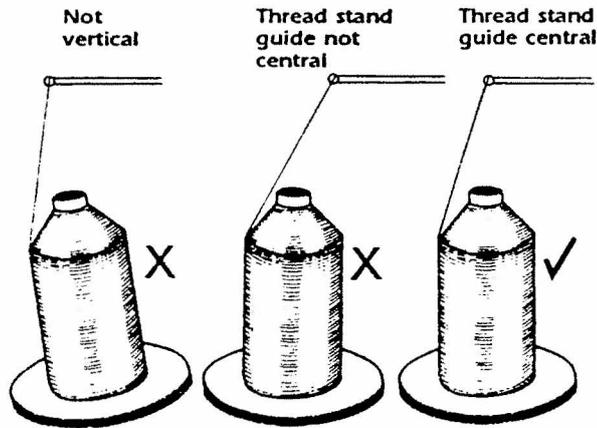
DIAGRAMS

Illustrations help information to be more easily understood - especially when demonstrating 'correct', incorrect, or even special points to watch.



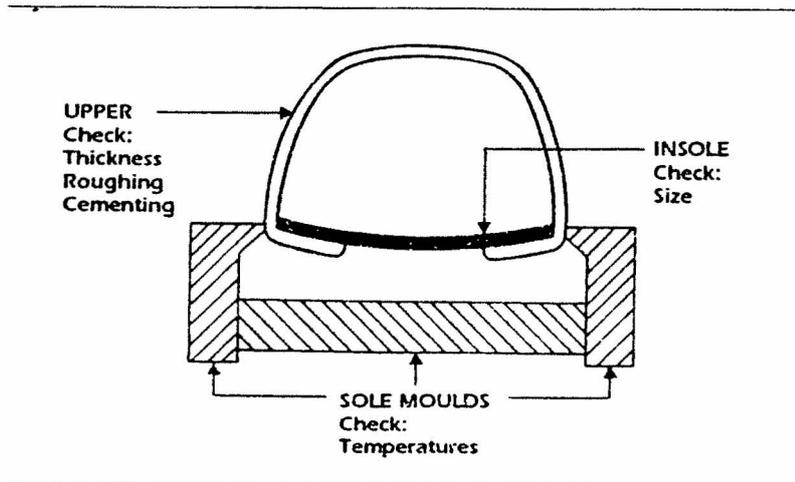
Distortion of press knives will affect accuracy of cut components

Shown here are the effects on a knife when the beam is incorrectly operated. The student can visualise knife distortion.



Is the thread correctly seated?

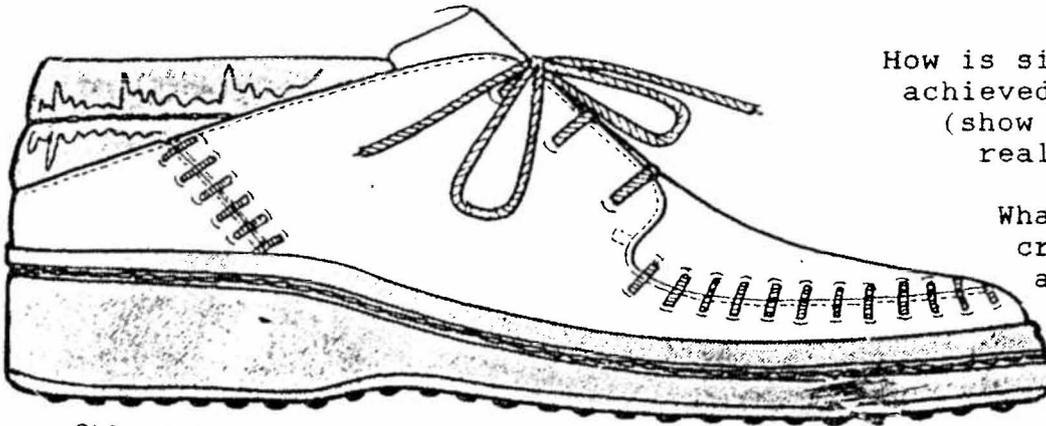
Many factors affect the successful stitch formation of a thread. Shown here is the relationship between bobbin location and thread guide. It is much easier both to explain and understand the problem by using illustrations such as this.



When it is necessary to provide detailed information where more than one factor is involved, then this diagram helps the student to remember more easily because a mental picture is formed. Repeated reference to this diagram is more likely to help information retention.

RESPONSIVE QUESTIONS

To associate ideas and bring them together to answer a question on design is really quite difficult as there are so many variables:



Side stitching

How is side-stitching achieved?
(show a good example, real or diagram)

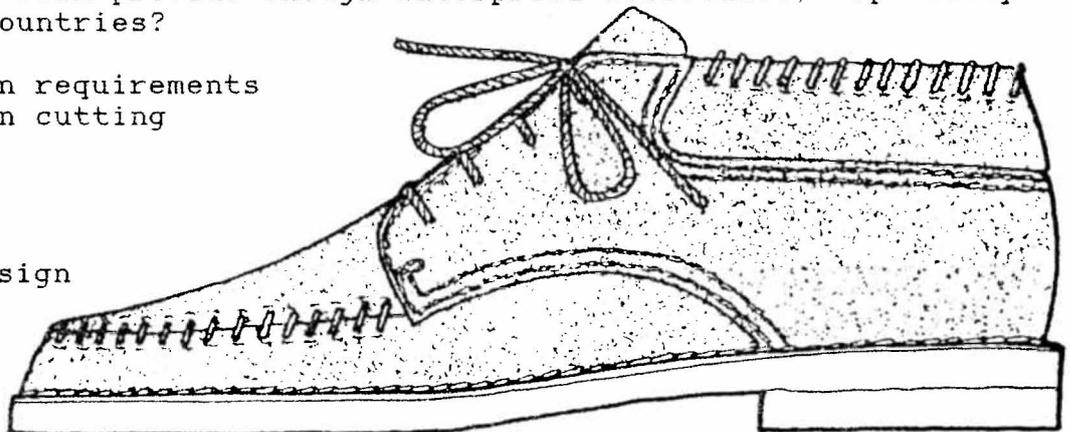
What problems are created when seams are in unusual positions?

How does tread pattern affect 'grip' on different surfaces?

Does an apron seam provide enough waterproof resistance, especially in European countries?

Why do fashion requirements create pattern cutting problems?

Is it possible to make functional design aesthetically pleasing?
How?



Hand thonging

On the following page there is a list of the essential qualifications for a shoe designer. Note how each statement has blank spaces to be filled in by the students after discussion. Ideally in groups. Group learning exercises really encourage students and develop various skills such as researching and logic. The second half of the page poses a question which requires the application of reason, logic and experience, which the tutor can guide to result in correct solutions.

THE WORK OF THE SHOE DESIGNER

The essential qualifications of a designer for bulk production are:

1. A thorough knowledge of the processes of manufacture especially closing and making.
 2. An individual style of originality in keeping with fashion and trade demands.
 3. A knowledge of colour theory and their colour combinations.
 4. The ability to produce, from a sketch, a well-balanced shoe.
 5. An economical shoe in departments where it is most essential such as with material to labour costs.
 6. A sound understanding of art as applied to the shoe industry.
 7. An appreciation of the possibilities of the plant and limits of the labour force.
-

Design can be likened to a three-legged stool:-

Construction

Price

Materials

such a stool would be stable, however if we add the other leg (fashion) the situation becomes unreliable and unpredictable.

PRACTICE!

PRACTICE!

PRACTICE!

and finally PRACTICE. It really is of the utmost importance that students have every opportunity to do practical work. The practice and the theory together make for a successful, balanced manager. Whether it is in machine settings:-

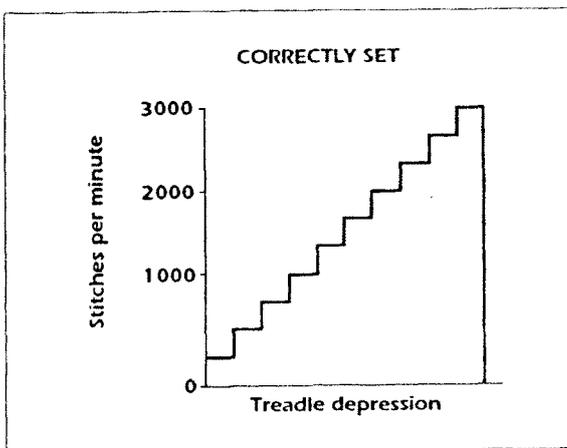


Figure 1, left. Correctly set stepped motor machine

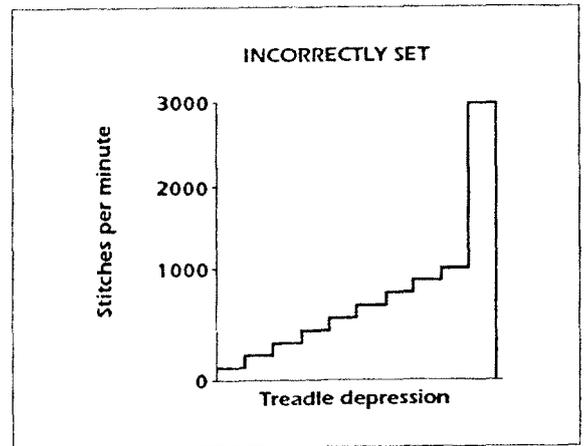
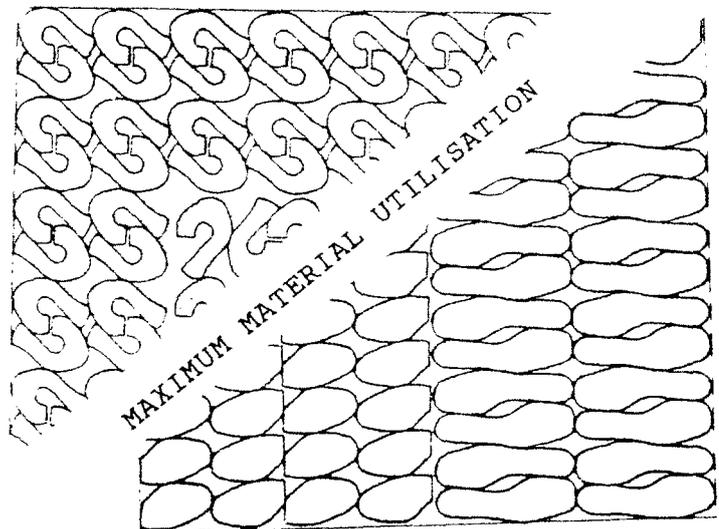
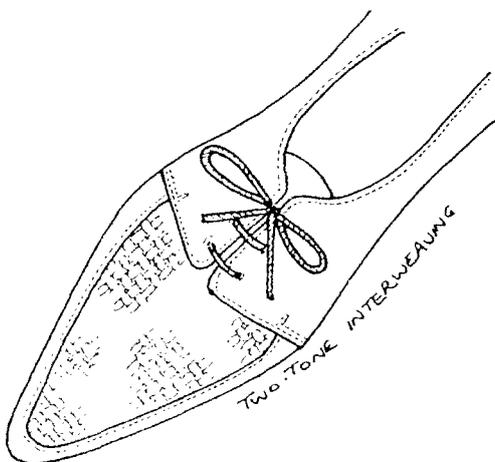


Figure 2, right. Incorrectly set stepped motor. The machinist is effectively limited to a maximum speed of 1000 stitches per minute.

It is not necessary to use actual leather for lay-outs, but to chalk up skins or even draw on paper - principles are understood



The skills of lasting can be understood best through 'pullovers', even making vamps alone will give the message of directional stresses, especially on a shoe like this one.

And finally, develop the teaching styles that make the learning process **INFORMATIVE AND ENJOYABLE.**

COMMON SKILLS PROFILE & LOG SHEET

Sheet No.

NAME:

COURSE: ONC YEAR

COMMON SKILL	OUTCOME	WEEKS												Final Grade
		Enter 'X' when outcome is awarded												
		1	2	3	4	5	6	7	8	9	10	11	12	
Managing and Developing Self	1. Manage own roles and responsibilities													
	2. Manage own time in achieving objectives													
	3. Undertakes personal career development													
	4. Transfer skills gained to new and changing situations and contexts													
Working with and relating to Others	5. Treat others' values, beliefs and opinions with respect													
	6. Relate to and interact effectively with individuals and groups													
	7. Work effectively as a member of a team													
Communicating	8. Receive and respond to a variety of information													
	9. Present information in a variety of visual forms													
	10. Communicate in writing													
	11. Participate in oral and non-verbal communication													
Managing Tasks and Solving Problems	12. Use information sources													
	13. Deal with a combination of routine and non-routine tasks													
	14. Identify and solve routine and non-routine problems													
Applying Numeracy	15. Apply numerical skills and techniques													
Applying Technology	16. Use a range of technological equipment and systems													
Applying Design and Creativity	17. Apply a range of skills and techniques to develop a variety of ideas in the creation of new / modified products, services or situation													
	18. Use a range of thought processes													

Logbook Sheet

Log sheet no

Date

Centre
Learner
Programme
Skill area or module
Review reference

Future action to be taken by learner and personal tutor:

Key objectives for next review period	Activities providing an opportunity to demonstrate achievement

Competences to be reviewed at this stage	Supporting evidence

Signature of learner & date

Signature of personal tutor & date