EXERCISE

(Continued from p. 3.39)

Function No.	Description of precise activities for each function

teaching techniques

The Handbook does not give detailed descriptions of the different teaching techniques employed in centres for training health personnel. This is intentional, for an abundant literature is available on these subjects to which the reader is referred (see references). Another reason is that the main purpose has been to stress the relevant aim of the teaching (whence the almost obsessional insistence on the need to define educational objectives) (chapter 1) and on the means for checking if and how these aims have been achieved (chapters 2 and 4). The problem is not merely one of *communicating* better (this is the subject of chapter 3) but of better communicating a *relevant message*.

For details concerning teaching techniques, lectures, seminars, tutorials, practicals, programmed learning, etc., the reader should refer to the specialised publications (see references, page 7.01). The following are also suggested as useful reference documents:

The lecture method of instruction — Eileen Bughman, Public Health Papers No. 52, WHO, pp. 57–63.

Audiovisual aids to learning. E. B. Penta and T. V. Telder, Public Health Papers No. 52, WHO, pp. 40–51.

The selection of teaching/learning materials in health sciences education. WHO Technical Report Series No. 538.

Audiovisual media in medical teaching — M. A. C. Dowling, Public Health Papers No. 47, WHO, pp. 53–78.

Group techniques in education, UNESCO, Educational Studies and Documents Series, No. 24, Paris 1977.

As a teaching technique workshops are certainly very useful and efficient. For details see chapter 5.

The teacher's role is to encourage the desire to learn rather than the desire to know.

advantages and disadvantages of certain teaching methods and of different educational media

Advantages	Disadvantages
1. Lectures	
1 Apparent saving of time (for the teacher) and resources 2. Presence of the teacher (showmanship) 3 Covers a large group of students 4 Gives a feeling of security.	1. Keeps the student in a passive situation. 2 Does not facilitate learning how to solve problems. 3 Offers hardly any possibility of checking learning progress. 4. Does not allow for individual pace of learning. 5. Low receptivity.
2. Small group activities	
1. Permits a teacher/student dialogue (thanks to the availability of the teacher). 2. Facilitates evaluation	1. High costs in personnel and time (unless peer-teaching is used)
3. Practical work 4. Bedside teaching 5. Field work	
1. Puts the student in an *active* situation. 2. Covers a limited group of students. 3. Permits evaluation of degree to which educational objectives (practical and communication skills) have been attained 4. Develops qualities of observation and decision-taking. 5. Ensures closer contact with reality (professional, health situation of country, colleagues and teachers) 6. Permits comparison between practice and theory. 7. Enables student to develop self-confidence 8. Increases variability.	1. High personnel, transport and material costs. 2. Sometimes puts the patient in a difficult situation 3 Poor standardisation. 4. Narrow limits of utilisation, therefore requiring careful planning

Advantages	Disadvantages
6 Books, handouts, programmed learning from books, and simulation (self learning packages).	
1 Enables student to work at his own pace 2. Facilitates self-evaluation 3. Makes mass teaching possible with high efficiency 4. High availability 5 Facilitates decision-taking (solution of complex problems) 6 Reduces risks (for patient or society). 7 Avoids bias transmitted by "bad teachers". 8. Allows a good teacher to save time that can then be spent on more complex activities such as interpersonal relations. 9. Can be kept up to date with new scientific developments and contain references to other documents	1 Necessitates special educational competence 2. High additional *investment* costs (in teachers' time and money) 3. No group dynamics
7. Real objects and specimens	
1. Present reality, not substitutes 2 Three dimensional. 3 Permit use of all senses in study.	1. May not be easily obtainable 2. Inconvenience of size – danger in use 3. Costly or not expendable. 4. Usually only usable in small groups. 5. Sometimes easily damaged. 6. Problems in storage.
8 Models and simulation devices	
1. Three dimensional and concept of reality. 2. Size allows close examination 3. Good for magnified situation (e g. middle ear mechanism) 4 Can be used to demonstrate function as well as construction 5 Can permit learning and practice of different technique. 6 Some can be made with local material	1. Craftsmanship required for local construction. 2 Simulation models often expensive 3 Usable for small groups. 4. Models often easily damaged 5 Never *same* as performing technique on a patient. Beware of faulty learning

Advantages	Disadvantages
9. Graphics (charts, diagrams, schematic drawings), posters, paintings, photographic prints	
1. Promote correlation of information. 2. Assist organisation of material. 3. Photographs nearer to reality than drawings, but association often valuable. 4. Usually easily produced and duplicated (black and white photos). 5. Easy to store, catalogue and retrieve.	1. For small audiences only (unless projected with epidiascope). 2. For effective use, good duplicating equipment and trained staff needed.
10. Blackboard or flipchart	
1. Inexpensive, can be made locally. 2. Usable for wide range of graphic representation. 3. Allows step-by-step build up, or organisation of structure or concept.	1. Back to audience. 2. Audience limited to 50 or so. 3. Careful drawings erased, not preserved for future use, except in the case of flipcharts. 4. Considerable skill required for effective use (rarely taught to teachers).
11. Flannelboard (flannelgraph). (Most of the comments apply also to magnetic board).	
1. May be used repeatedly. 2. Usually preparable from locally available materials. 3. Good for showing changing relationships. 4. Holds attention if well used. 5. Can be adapted for group participation.	1. For limited audience only. 2. Difficult technique to use convincingly.
Projectable Media	
12. Still pictures – Opaque projection (epidiascope)	
1. Enlargement of drawn or printed materials for large audiences. 2. Obviate need for producing slides and transparencies. 3. Enlarged image may be transferred to chart or blackboard for copying. 4. Small objects and specimens may be projected.	1. Demands total darkness for clear projection (except with very expensive models). 2. Bulky machine, difficult to transport. 3. Electricity required.

Advantages	Disadvantages
13. Transparencies for overhead projection	
1. Projectable in full daylight to large audiences. 2. Presented facing audience. 3. Relatively easy to prepare with local materials. 4. Subjects can be drawn in advance or developed by stages with the group. 5. Can demonstrate movements, processes, etc. with transparent or coloured perspex models.	1. Electricity required. 2. Equipment and materials for making sophisticated transparencies expensive. 3. Not usually suitable for photographic material due to cost (although adaptor available to take 35 mm slides). 4. Usually restricted to teacher use, as it is not easy to adapt for the learner to use.
14. Slides and filmstrips	
1. Suitable for large audiences. 2. Relatively easy production and (in black and white) reproduction. 3. Cheapest current forms of visual medium. 4. Easily adaptable to self-learning packages. 5. Equipment available for viewing or projection without electricity source.	1. Fixed order of frames in filmstrip restrictive in use. 2. Need partial darkness for viewing unless rear screen or daylight screen used. 3. Duplication of colour slides expensive (even impossible in many countries).
15. Microfiches	
1. Easy storage and cataloguing of large numbers of visuals. 2. Exchange of information on available collections. 3. Very cheap per image if projection can be assured for large groups. 4. Small and light for easy despatch.	1. Too small for clear naked-eye viewing. 2. Although inexpensive equipment available for individual use, large group projection equipment not readily available.
16. Films 8 mm and 16 mm	
1. Close to reality with movement and sound. 2. Suitable for large audiences (16 mm); for small groups only (8 mm). 3. Compression of time and space. 4. Emotive, can develop attitudes, pose problems, demonstrate skills.	1. Does not permit self-pacing. 2. Films costly and difficult to produce. 3. Individual films relatively expensive. 4. Electricity required. 5. Equipment difficult to transport.

Advantages	Disadvantages
16. Films (8 mm and 16 mm) continued.	
5 8 mm loops useful for individual instruction 6 Good learning source if preceded by teacher's introduction and followed by discussion.	6 Darkness needed for viewing (except rear screen use). 7 Imported film may contain inappropriate information (see item in advantage 6).
17 Open circuit television	
1 Adaptable to large and small audiences in widely distributed area 2. Capable of gaining and maintaining attention. 3 Can stimulate emotions, build attitudes and develop problems 4. Can conserve resources of instructors by simultaneous broadcast to many classes	1. Programme expensive to produce and demands highly skilled staff. 2. Receiving equipment expensive and difficult to maintain. 3. Electricity required 4 No immediate interaction or feedback. 5 Learner must adapt to a set programme with no possibility of repeats
18. Closed circuit television and videotapes (including videocassettes)	
1. Adaptable to medium and small audiences 2 Videotape repeatable to fit learning schedules. 3. Film advantages 1, 3 and 4 apply (see above). 4. Valuable for magnification of image, recording intimate situations, micro-teaching, recording of developments in clinical syndromes or in scientific experiments, "bringing the village into the classroom", recording emergencies, etc. 5. Portable equipment can function on battery for field recording.	1. High initial cost of production equipment, and requirement of trained staff. 2 Electricity required Although portable equipment works off battery, this needs charging from power source. 3 Receivers are expensive and require maintenance.
Sound Media	
19. Radio broadcasts	
1. Adaptable to large and small audiences in widely separated areas 2 Conserves resources of instructors by broadcasting simultaneously to many classes.	1 Special studio facilities and staff required for broadcast (less expensive and complex than television). 2 Learners must adapt to fixed schedule, not other way round

Advantages	Disadvantages
19. Radio broadcast (continued)	
3. Capable of gaining and maintaining attention. 4 Reception equipment relatively cheap and will function on batteries 5. If combined with prepared materials (radiovision) can be improved learning tool.	3. No immediate feedback and no audience interaction.
20 Sound recordings	
1. Adaptable to any size of audience. 2 Especially suited to individual and small group learning. 3. Because of stop and playback facilities of tape, can be student paced 4 Cheap, battery operated cassette players available, and cassettes relatively cheap. 5 Many uses – to provide sound for slide sequences, for micro-teaching, heart sounds, for posing problems, etc.	1 Use for individual learning demands many playback units 2. *Good* quality recording demands studio facilities.

Note concerning the preparation of "transparencies"

Certain pages of the Handbook are printed in large type and can be used as *matrices* if you should wish to make your own transparencies for projection using an overhead projector

There are different methods, depending on the photocopying equipment available.

In general, all you need do is to place a sheet of transparent, thermosensitive acetate film on top of the Handbook matrix[1] and put the whole in the photocopying machine In a few seconds you will have a transparency ready to be projected on your overhead projector.

Please follow the instructions applying to the particular photocopying machine available to you.

[1] You can obtain them by removing the binding from the Handbook and placing the sheets in a ring-file

self-learning packages

If you agree that one of your functions as a teacher is to prepare learning aids for your students and to help them obtain the information they need for independent learning, then read the following pages which explain what self-learning packages are and give an example of this learning technique

We have seen that a professional task derived from an intermediate objective may serve one or more specific objectives, either final or enabling The task must be broken down to the level of the specific objective, which must have two characteristics it calls for a single activity; and it can be satisfactorily evaluated by applying a single criterion measuring a given domain

Such a specific objective, or task, constitutes the basis for constructing "packages" designed to facilitate self-learning

Each self-learning package will comprise

1 The statement of the specific objective

2 The full documentation needed to achieve the objective. This may include references to any of the following existing papers, tape recordings, slide sequences, places, persons, and so forth

3. A formative evaluation instrument to enable the student to assess the extent of his success in reaching the objective

In some cases, several closely linked specific objectives are related to the same learning activity. It is then advisable to avoid too detailed a breakdown, and to combine the different "packages" for such a learning activity into one "super-package"

A self-learning package is a document containing all that is necessary for a student to attain one or more educational objectives independently of the teacher. Using these packages, the student can take over a large part of his training, while the teacher remains available only when needed

The technique of self-learning packages is similar to that of the Keller plan (see Bibliography), but the latter also includes the coordination and supervision of the student's activity by monitors, and group work sessions to stimulate students' motivation

A simple example of a self-learning package is given in the following pages. More complex examples would also include slides and transparencies, X-ray photographs, loop films, laboratory and field work, and so forth

self-learning package

WHO-sponsored Training Course in Epidemiology

Main topic. Sampling

Sub-topic· Sampling techniques (Prepared by Mr T K. Sundaresan)

Relations to the functions of the epidemiologist

Sample surveys are an efficient and economical means for obtaining information on matters of epidemiological importance, e.g prevalence of specific diseases. There are several sampling techniques available to suit different practical situations and specific objectives of the investigation. For a given situation one technique can be more efficient and economical than another. A knowledge of these techniques, their advantages and disadvantages all greatly help in choosing the most appropriate technique for that situation.

Educational objective (Ref. No 5.6)*

After studying this document and doing the exercises listed at the end you should be able to suggest the appropriate sampling technique for most epidemiological investigations

Pre-requisites to understanding this section

1 Understanding the concept of random sampling (Educ Obj. No 5.2)*

2. Understanding the terms "precision" and "accuracy" (Educ. Obj No 5.3)*

3. Understanding the concept of "confidence intervals" (Educ Obj. No 5 4)*

1 Preamble

The epidemiologist, wishing to carry out a sampling investigation, has often to choose one of several techniques of sampling. Some of the considerations that play a role in the choice of the most appropriate technique are availability of a suitable frame, facility of the field operations, acceptable precision of the estimates, the sub-categories of the population for which separate estimates are required, etc There are many techniques available but in this package only the following will be considered

1. Simple random sampling
2 Stratified sampling
3 Two-stage sampling, *and*
4 Cluster sampling

Simple random sampling

Definition A sample of size n, drawn from a population of size N in such a way that every possible sample of size n has the same chance of being selected, is called a *simple random sample.*

Example It is desired to determine the prevalence of a certain infectious disease among the 1000 people in a village (N = 1000) The desired accuracy of the estimate dictates that 100 people from the village must be examined for the disease (n = 100) A list of all inhabitants is obtained (the population frame) Then, using a table of random numbers, a sample of 100 persons is selected in such a way that each person in the village (i e., each entry in the list) has a 10% (n/N) chance of being selected for the examination

*Note These references are to a document distributed to participants at the WHO Training Course

Advantages:

1. Simple design.

2. Requires no knowledge of the distribution of the study variable in the population.

Disadvantages:

1. Requires a population frame which can be expensive or simply not available.

2. Travel expenses could be high if the population is spread over a large area.

Stratified random sampling

Definition: ***A stratified random sample*** is one obtained by first separating the population into non-overlapping groups, called ***strata***, and then selecting a simple random sample from each stratum.

Example: Continuing with the example given above for simple random sampling, before selecting the random sample of 100 the entire population is divided into age-groups (stratified on age). Then a simple random sample is taken from within each age-group (stratum). The total number of examinations is still 100, but now the prevalence is available ***by age-group*** and the precision of the ***overall*** prevalence estimate is improved. This improved precision is due to the fact that sampling is now done within more homogeneous groups (under the assumption that prevalence is correlated with age).

Advantages:

1. Estimates are available for each stratum of the population and not just one overall estimate, as in simple random sampling.

2. Some gain in the precision of the overall population estimate, with an appropriate method of stratification.

Disadvantages:

1. A population frame is required.

2. Certain preliminary information is required on the variable(s) to be used for stratification. This may be expensive or simply not available.

3. While stratifications on certain variables may improve the precision of the estimate of one parameter (prevalence of a disease, in the above example) it may give rather poor estimates for other characteristics to be studied at the same time (e.g. fertility).

Cluster sampling

Definition: ***A cluster sample*** is a simple random sample in which each sampling unit is a collection, or cluster of elements.

Example: Continuing with the above example; if a population frame is not available, then the sampling may be done as follows: a list of dwelling units is drawn up; this is much easier than a complete list of individuals. A simple random sample of dwelling units is selected and all individuals in each selected unit are examined.

Advantages:

1. Reduction in travel costs

2. Complete population frame not necessary

Disadvantages:

1. The variability within and between clusters must be considered. If the variability within a cluster is low, this could lead to unnecessary within-cluster precision, using the same number of examinations, while insufficient precision is obtained for the overall estimate.

Two-stage or sub-sampling

Definition: A two-stage sample is obtained by first selecting a sample of groups and then selecting a (sub) sample of elements from within each of the sampled groups.

Example: Continuing with the previous example; the investigators decide to use the list of dwelling units, as the population frame is not available, but wish to cover more dwelling units with the same number of examinations. A simple random sample of dwelling units is selected, then, as the second stage, a simple random sample of the individuals within each of the selected dwelling units is chosen.

Advantages:

1. Wider coverage. If it is believed that individuals within the same dwelling unit are similar with respect to the quantity measured, then it makes little sense to measure the same thing so many times.

2. Does not require a complete population frame.

3. Reduction of travel costs.

Disadvantages:

1. It sometimes can cause difficulties to include in the sample only a portion of a household or group.

2. Incomplete information concerning the distribution of the quantities measured at the various stages can lead to poor results.

self-testing exercises

(a) A survey is planned to determine fertility rates in a large geographical area for which no accurate lists of individuals exist; however the villages and towns are well documented.

1. Suggest two possible sampling schemes.

2. State two advantages that each has over the other.

(b) It is desired to know the morbidity rate among the population of a city. The results of a recent census, including age and sex, are available.

1. Suggest two possible sampling schemes.

2. State two advantages that each has over the other.

(c) It is desired to estimate the prevalence of tuberculosis in a country. The population census is at least 10 years old and it is known that movements of population may have taken place. It is also suspected that the prevalence in urban areas is likely to be different from that in rural areas. Make any assumptions, relevant to your country context, on operational factors and suggest a sampling scheme.

answers

(a) 1. Cluster and two stage

2. Cluster over two stage:

- reduced travel cost (must visit fewer villages)
- simplified design
- requires less knowledge of the distribution of the variables measured

Two stage over cluster:

- wider coverage (provides estimates for more towns and villages)
- more flexible, one can alter sampling fractions to attain increased economy if there is some preliminary knowledge about the variability among villages

(b) 1. Simple random and stratified random

2. Simple over stratified:

- simplified design
- no prior knowledge of the distribution is necesssary

Stratified over simple:

- estimates by age and/or sex may be obtained
- more precise overall estimates may be obtained

(c) Suppose is it most efficient operationally

1. to examine all members of the household once a household is selected, ***and***

2. to station the mobile X-ray van and the team in one area for at least one week

3 and suppose that 50 individuals can be examined in one day, and further that

4. at least 20,000 individuals have to be examined to yield an estimate with acceptable precision.

The following can be recommended as one possible procedure

Because of the operational factors outlined it would be best to adopt a multi-stage cluster sampling, stratified into rural and urban areas. Suppose it is decided to examine 10,000 individuals in the rural and 10,000 in the urban areas Taking as an example the rural areas. the 10,000 individuals could be considered as the population of 40 clusters consisting of 250 individuals in each cluster (50 individuals per day) for five days a week. If the average household size is 5 this would mean 50 households in each cluster.

Based on the old census, the country can be divided into its major administrative divisions, and the 40 clusters allocated to these divisions in proportion to their population.Within each major administrative division, minor divisions where the cluster should be located may be selected at random at the second stage. Further stages may be introduced if the divisions are large

Once the last stage, say a sub-division with a population of around 1000 is reached, a complete census of this sub-division is made and a household selected at random. Fifty consecutive households in a predetermined order will give the required cluster.

criteria for priorities in selecting packages

1 They should deal with an educational problem of major importance for the majority of students.

2 They should be directed to the solution of a health problem of major importance for the people.

3. They should make good a deficiency in the existing teaching system or in existing educational tools.

4 They should not needlessly be superimposed on another package dealing with the same problem

5 They should allow for the possibility of prompt updating when required.

6 They should be more effective and economical than any other educational tool serving the same purpose

Educational concepts that are useful in weighing the advantages and disadvantages of self-learning packages or other teaching methods.

1. Educational activities should be directly related to the tasks to be performed by the trainees (relevance).

2. Tasks should be explicitly defined and should correspond to community health needs.

3 Educational activities should be designed to meet students' needs, with emphasis on individual training and the possibility for each student to work at his own pace, even in mass teaching situations

4. The educational system should provide the student with the work tools he needs for his continuing education

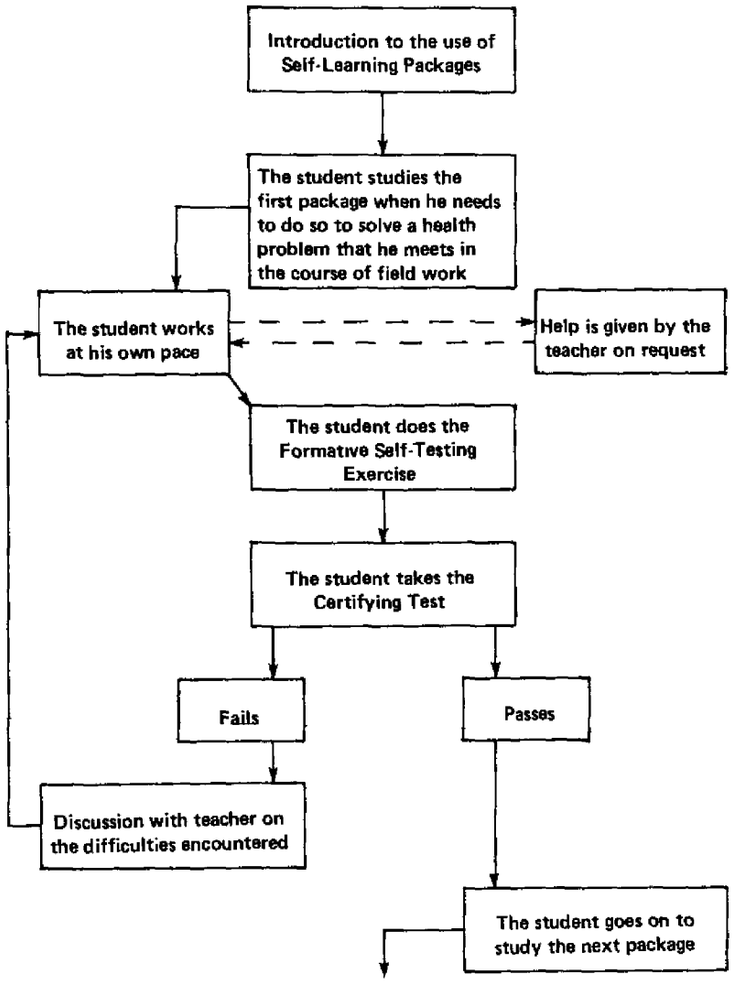
5. Educational activities should if possible take place in the same sociocultural environment as that in which the professional tasks will be performed. They should include the practice of the same skills as will be required in real problem-solving situations.

6. All training activities must be accompanied by formative evaluation.

7 Learning techniques also must undergo evaluation during use in order to ensure that they really correspond to the students' needs and are in accordance with the sociocultural environment, they must also be practicable in use for both students and teachers.

8 The overall evaluation of the programme must be incorporated in the system.

how to use the packages



some introductory remarks on the construction of a student-orientated programme

It has already been said that the educational spiral should be taken into account in constructing a programme (see p.3.03)

Other major considerations are:

The student should be motivated Learning is not only an intellectual but also an emotional process The student's motivation will be all the greater if he takes part in preparing *his own* learning programme This is a fundamental consideration, and will be dealt with later (p. 3.63)

The student should be able to see the links between his different learning activities. However, the health professions have become more and more complex and teaching institutions have had to use an ever greater number of teachers in a growing variety of subjects. The result has been a *disintegration* of programmes It is therefore important to ensure that the programme is not itself constructed in such a way as to be a source of disintegration The student should be enabled to participate in a large number of learning activities, either simulated or real, which should constitute true exercises in integration

The student should be able to connect practice with theory. In most teaching institutions, this connexion is rarely close. Very often, the emphasis on theory in examinations has an unbalancing effect. The learning programme should be oriented to the real life situations that will be met in the course of future professional activity. As he tackles each health problem the student should become gradually more proficient in analysing a situation, gathering the necessary data, perceiving the relevant theoretical bases, perhaps through the use of self-learning packages, and profiting from a self-evaluation test that keeps him informed of his progress

If the above elements are kept in mind, the learning programme will leave room for individual training and enable the student to develop a method of work that will serve for his effective continuing education.

The role of the teacher is of prime importance for the proper implementation of such a programme It was described on pp. 3 33 – 3 37.

The essential point in constructing a student-oriented programme is to organise the rotation of students from different years in the different places of learning activity (professional fields) in small groups under the responsibility of teacher-coordinators; in that way students are progressively confronted with health problems according to their level of abilities They have at their disposal a variety of self-learning packages and other sources of information and experience such as workrooms, library and laboratories, while their efforts are guided and their progress is measured by a system of formative evaluation based on pertinent educational objectives.

The scheme outlined above is oriented to students' learning needs, and is a far cry from a teaching programme conditioned by the competency and availability of the teachers.

After doing some of the exercises in selecting teaching methods (pp.3 57 and 3 58), you could refresh your memory on integrated teaching (pp 3.59 and 3.60) and also on integrated learning (p 3 61), before going on to consider how to plan programme reforms (pp 3.66 – 3.74) with all that implies in the way of constraints and obstacles to innovation and change

Personal Notes

EXERCISE

Do the following exercise if you wish to gain practice in selecting appropriate teaching methods and/or educational media to help students attain a given educational objective.

Look at the specific educational objectives on page 1.52, or take any other specific objective you may prefer, and select the appropriate method(s) or media (indicating the number, from 1 to 20, for each given on pp 3.42 – 3 47), and describe the constraints likely to be encountered in your institution.

Objective No.	Method or media	Constraints to be overcome
1	handouts (6) work in small groups (2)	requires the duplicating of patients' histories, with no budget provision up to now for paper or machine; peer-teaching is not customary and will need a trial period.
2	field work (5) work in small groups (2)	requires long preparation including the prior selection of families to be visited in collaboration with a social worker.
3		
4		
5		
6		
7		
8		
9		

Check whether your choice is consistent with the educational concepts on p.3 53

EXERCISE

Look at the educational objectives on page 1 52, or take any other specific objective you may prefer, and describe two teaching methods that will enable a class of 200 students of the same year to attain the objectives. Compare the two methods using the criteria appearing in the following *specification table.*

Objective	Establish the differential diagnosis of a case of anaemia on the basis of the haematological data in the patient's records.	Relevance	Efficiency	Practicability
I	Lecture on the differential diagnosis of anaemias — 1 hour	***	*	***
II	Handout giving book references on anaemias, patient histories, and a self-testing exercise	***	***	**

Example of Teaching Method for a class of 200 students

Objective	The student should be able to	Relevance	Efficiency	Practicability
I				
II				

Check the meaning of the words: Relevance, Efficiency and Practicability in the Glossary page 6.01

the concept of integrated teaching

1. Definition

Integration (from the Latin integer = whole) means coordination of different activities to ensure harmonious functioning.

This definition suggests that the result of harmonious functioning will be greater efficiency. In our materialistic world efficiency is a dogma In the developing countries it is the key to survival. Neither the idea nor the word is new At present both are fashionable and, as is often the case in such situations, infatuation and passion are more in evidence than logical analysis and objective appraisal Such things are used, abused, transformed and deformed.

The password is "integration" What is integration?

We are concerned here with the meaning of integration in the field of professional education and training To paraphrase the definition given above, integration in this field is "the coordination of different teaching activities to ensure the harmonious functioning of the educational process for more effective staff training."

2 The purpose of integration

Before the era of the mega-universities with thousands of students and before the era of specialisations stemming from a technology ramifying in all directions, the health professions were learned in the presence of the patient and in direct contact with the professor — a natural source of integration During training, there were of course several professors and the student — second natural source of integration — assimilated, analysed and synthesised the information.

Since the beginning of the twentieth century, the university-factory, the numbered and card-indexed student, and the super-specialist have made their appearance. Fundamental and staggering scientific discoveries are being made faster than textbooks are revised and reissued. Research laboratories are draining away and absorbing funds intended for training centres Teachers engage in research since their future depends on the results they obtain in their field Without organised teacher-training, they are entrusted with students who are not supposed to appraise their performance. Reputation depends on the number of publications rather than the quality of the health personnel trained. Theoretically, the health worker, once trained, is a complete and integrated element. In practice, he is the outcome of a non-integrated training lacking in human feeling.

Human feeling, the concept which should inspire students and teachers, implies concern for improving the health of the people and should be the basis of the educational objectives of the university centres for health sciences. These objectives, shared by teachers and students alike, will be more easily attained if the various teaching activities function harmoniously, hence the concept of integrated teaching

3 The advantages of integrated teaching and its limitations

The advantages attributed to integrated teaching are many and attractive. They include the synthesised presentation of important health problems, the avoidance of contradictions and pointless repetition, the respect for a logical order and the pruning of non-essential details, the improvement of the quality of teaching and teachers through emulation and of the relations between departments, and a better utilisation of teachers

Yet some faculties that have tried it have given it up. A much larger number claim to use it but, in fact, do not do so or do so only partially.

Why is it then, that in spite of so many advantages, this method has met with more failures than successes after a very large number of trials over the last 30 years?

We do not pretend to give a reasoned answer to this question, or statistical data for or against the method. The facts can be found in the literature dealing with this question

We are deeply convinced, however, that the concept of integrated *teaching* suffers from a basic defect. as its name indicates, *it is teacher oriented.*

All educational theories have emphasised the efficiency of *student-oriented methods.*

If you turn back to the principles stated on pages 3.18 – 3.37, you will see that very few of them have been really put into practice in the various trials of integrated teaching. ***Integrated*** teaching certainly has advantages over any type of non-coordinated teaching of separate subjects, but it remains a form of traditional teaching in which the teacher is predominant, and is less conducive to efficient learning than educational activities designed to help the student and lead him to achieve the necessary integration by his own efforts.

A programme composed of such educational activities, oriented to the student and not to the teacher, is suggested for your attention in the following pages.

It is the *concept of integrated learning.*

the concept of integrated learning:

a learner-orientated programme with built-in relevance and based on the acquistion of skills.

In teaching the health sciences, educators have, up to the present, more often failed than succeeded in incorporating that essential quality of any programme – its relevance. The relevance of a programme is the extent to which it facilitates the acquisiton by the student of all *the skills necessary for the practice of his profession,* whose purpose is to raise community levels of health.

In chapter 1, the basic elements necessary for formulating relevant educational objectives were indicated. It was then stressed that the ***health needs*** of populations, taking into account their available ***resources***, should serve as a basis for such formulation. A further point made was that health planners should define the types of *health service* organisation most suitable for solving the health problems of a given population, as it is within the framework of these services that the individual members of the health team will play their ***roles***, fulfil their ***functions*** and accomplish their special ***tasks*** It was also pointed out that, in defining these roles, functions and tasks, account should be taken, as far as possible, of what would be expected of members of the health team in their future work.

Consequently ***prospective definitions*** are required such forecasts being dependent on the complexity of the skills to be acquired and the consequent duration of the training programme For those professions requiring high levels of competence (physicians, sanitary engineers, etc.) it has not been possible to define the tasks they will have to carry out in 10 years' time, other than in the form of assumptions which have variable degrees of reliability. Perhaps the developments in the science of futurology will ultimately make it possible to find solutions for this problem

Until this is possible, however, other solutions should be envisaged

A few years ago Laurence Weed suggested a new programme of medical education[1] which attempts to resolve the notorious and difficult problem of relevance. The originality of Weed's proposal is that it seems to solve this problem while remaining within the strict framework of training (refer once more to the diagram on page 1.08). Its main point is that the student should acquire a method of working and thinking that allows him to adapt to a rapidly changing situation while at the same time acquiring the skills he needs to practise his chosen profession.

A type of educational programme, inspired largely by that of Weed, is proposed in the following pages. Additionally it comprises an orientation closely linked to community rather than individual health problems, and it allows the student himself to make a free and enlightened choice of the role he wishes to play in society.

The programme is based on a certain number of Weed's premises which must be stated first of all, since any disagreement with these premises would probably lead to a rejection of the proposed programme. On the other hand, the mere fact of agreement with the premises would not, for most teachers, be a sufficient reason for accepting the new programme, and certainly not for using it to replace a traditional programme This new approach is, to say the least, revolutionary; it requires replacing a whole programme and not merely changing parts of it.

The catch is that, at first sight, the premises seem relatively harmless and so inoffensive that the most traditional educator is ready not only to agree with them but even to claim that they are nothing new and that he himself adopted them long ago (if, indeed, he did not think of them himself)

[1] Described in his book Medical records, medical education and patient care. Cleveland, The Press of Case Western Reserve University, 1970

Weed's premises

1. **General educational objectives**

   A health professional should be able

   1.1 to set his personal *goals related to his work* within the organised system of health services, and to develop his own approaches to the achievement of these goals; he must also seek criticism from teachers and fellow students.

   1.2 to define health *problems* and to collect relevant data and utilise them for solving the problems

   1.3 to *audit* his own performance or that of a colleague using carefully established criteria.

   1.4 to demonstrate the *qualities* of professional thoroughness, reliability, sense of analysis and efficiency.

2. **Teaching and learning techniques**

   The programme must make it possible for the student:

   2.1 to acquire basic *skills*, and not merely basic knowledge; practical and communication skills and not only intellectual ones; the preponderant role of recall must be reconsidered, the lasting ability to recall must be based on repeated use.

   2.2 to learn and think *independently* and to learn from his experience Every patient will be a source of data, while the teachers should ensure intellectual discipline and encourage value judgements.

   2.3 to acquire *independently*, by the study of documents and information prepared for the purpose (books, scientific journals, duplicated texts, audiovisual aids, etc.), everything that is usually transmitted by traditional lecture-courses, provided that the educational objectives are known to him and that he performs formative evaluation exercises constructed on the basis of the objectives

   2.4 to acquire his professional skills through *the practice of real professional acts* of increasing difficulty, compatible with his level of achievement.

   2.5 to practise professional acts under a control and supervision that leads him to *understand the underlying basic principles.*

   2.6 to find solutions to a diversity of new problems, thus developing his ability to carry on by himself once the problem to be solved has been defined.

3. **In the organisation of studies the following points should be considered.**

   3.1 The quality of achievement and acceptable performance for a given task should be regarded as a constant. *What can vary is the number of types of tasks* that a given health professional should be able to accomplish.

   3.2 The length of study programmes should *not* be regarded as a constant. It is preferable to have a clear definition of the skills to be acquired, and for *the time necessary* to master them to *vary* for different students, depending on their ability and drive and on the availability of teachers and educational facilities.

   3.3 There is no natural frontier in the practice of health care between the physical sciences and the humanities, nor between science and culture in the broadest sense of the word. Students should be enabled to define the patient's social and psychological problems in addition to his "medical" ones, and to look for a logical solution, either by themselves or with the aid of specialists, for each of such problems Simply to organise courses in the social and behavioural sciences does not automatically ensure that future physicians will be able to relate their daily practice to the culture to which they belong.

   3.4 The main educative role of the basic scientist is not to train health personnel in his special subject but to audit their performance to ensure the correct application, or to detect any violation, of the basic scientific principles of that subject.

competency-based programme/contract an excursion into Utopia

The programme includes four phases at the end of which the student is awarded *a degree certifying he has reached a satisfactory level for certain specified skills*

The total duration of each phase may vary for each student and is determined by the achievement of an acceptable level of performance for a given number of educational objectives which together constitute the basis of a *contract* between the student and the teaching institution. Depending on the terms of the contract, the degree may be that of doctor of medicine, nurse, medical assistant or, for example, specialist in cardiology or in stomatology

Description of the Programme/Contract

First phase (very approximate length — one to three months). Goal: *to learn how to learn.*

1 At the end of the first phase, the student should be able to

- 1.1 show competence in planning education at initiation level;
  - 1.1.1 define educational objectives on the basis of tasks;
  - 1.1.2 plan a learning programme, *and*
  - 1.1.3 construct tests and other formative measuring systems;
- 1.2 utilise the resources of the institution, such as microscopes, slides, library, computers, or members of the health team; *and*
- 1.3 describe the concept of health team.

Second phase (approximate length 12 — 18 months). Goal: *to identify his professional role in society.*

2 At the end of the second phase, the student should be able to

- 2.1 prepare a list of what he considers the ten *main* health problems of the community,
- 2.2 collect a data base on the community and interpret these data in order to:
- 2.3 identify its priority health problems;
- 2.4 describe the health activities (services) which would enable the community health problems to be solved, and compare these activities with those usually undertaken;
- 2.5 *identify the professional role* which he (the student) wishes to assume at the end of his training;
- 2.6 describe the functions, activities and tasks corresponding to that role; *and*
- 2.7 prepare a set of educational objectives[1] (with evaluation criteria) and indicate the acceptable level of performance for each of such tasks.

At the end of the second phase, a *contract* is signed between the student and the teachers (Faculty, School or other institution). The contract provides, on the one hand, that the student undertakes to achieve the educational objectives (described under 2.7 above) within a given period (e.g. three, four or five years), and, on the other hand, that the teachers undertake to facilitate the student's work (see the teacher's functions, pp. 3.33 — 3.37). It is understood that the teaching staff has full responsibility for certifying the abilities of the student before he is authorised to practise without supervision. The contract may be revised from time to time if the results of the evaluation procedures justify that course.

Once the *contract* is signed, the student really begins to learn his profession

[1] It should also be borne in mind that the definition, at the most general level, of educational objectives for the higher levels of professional staff must include the following objective "To be capable of finding solutions to problems arising from new situations" From that general objective, a whole series of more specific objectives will be derived, including the acquisition of a scientific manner of thinking, for which the teaching of the basic sciences will have a large responsibility, and of a method of work essential for the continuing updating of professional skills.

Third phase [1] (very approximate length – 1 year) Goal: *to learn basic techniques.*

3. At the end of the third phase, the student should be able to:

   3.1 collect the data base on the members of the community, both sick and healthy (the basic data, such as chief complaint, patient profile, systems review, physical examination, laboratory data, etc.) are clearly defined by Weed, the reader is advised to consult his works and make sure that students collect all the necessary data);

   3.2 audit the data base for a given patient collected by another student; *and*

   3.3 carry out clinical techniques (such as phlebotomy, sutures, lumbar puncture, funduscopy or auscultation) corresponding to the educational objectives described under 2.7

Fourth phase (very approximate length – 3 years) Goal *to acquire professional skills*

4. At the end of the fourth phase, the student should be able to:

   carry out (together with other members of the health team) all tasks involved in the health promotion/rehabilitation of the community in which he is living, and perform the role he has chosen for himself (see above 2.5 to 2.7).

Throughout these four phases, a series of formative tests are provided to enable the student to form an idea of what remains for him to do to attain the objectives he has set himself. The degree, or authorisation to practise his profession, is awarded by the teaching institution only when the student has demonstrated, by passing the *certification* tests, that he is capable of an acceptable level of performance for the objectives of the contract.

[1] The third and fourth phases correspond to the programme in the form proposed by L. Weed in The New Curriculum, the problem-oriented system, Medcom 1972, pp. 95 – 104

Unfortunately, it very often happens that, when the reader reaches this point, he decides that the programme is too utopian ever to be put into practice without a cultural *revolution* He is therefore urged to reread carefully the brief description of the various functions of the teacher given on pages 3.33 – 3.37 which are much more attainable within the limits of a certain evolution. He should then do the exercise on page 3.39. Perhaps a little day-dreaming was not such a bad idea, it can be valuable to set oneself an ideal.

Some universities and schools are already applying a good number of these principles. In WHO Public Health Papers No. 70 (1978) and No 71 (1980) you will find descriptions of the programmes of the McMaster University, Ontario, Canada, the Maastricht University, Netherlands, the University of Newcastle, N.S.W., Australia, or the Xochimilco University, Mexico, a description of the nursing training programme at the Mahidol University, Thailand, and accounts of training programmes for other health workers at Madang, Papua New Guinea.

briefly then, this programme

- is oriented to the needs of society
- ensures the continuous supervision of the student and protects society against incompetent health personnel
- provides a basis for continuing training
- concentrates on the interests of the student and encourages individual learning
- allows each student to work at his own level and at his own pace
- keeps students in an active situation and gives a leading role to experience
- leads the student to discover and understand the "why" and "wherefore" of his learning experience
- accepts the idea that it is all right to be different
- increases the student's sense of responsibility and his control over his own learning
- encourages students to collect, analyse, evaluate and interpret data
- emphasises the importance of cooperative self-evaluation
- confronts students with real-life situations
- introduces students to team work
- allows students to practise what they have learnt
- enables students to acquire their professional skills under conditions similar to those in which they will later practise

planning the changes required to bring about programme reform*

A key component of educational reform and innovation is the ***organisational modification*** needed to plan and implement the desired changes. In other words, how will the organisation be modified to facilitate change? Who is to do what and in what sequence? Is the completion of some tasks prerequisite to beginning others? What supporting actions need to be taken and what resources need to be made available in order for the change to take place in an orderly and effective fashion?

In order to illustrate some of the ***planning principles*** which need attention, the attached planning schedule has been prepared as an example.

Why a planning schedule

It is designed to help to answer the following questions:

- If a curriculum is designed on the basis of ***professional skills to be acquired*** rather than ***time to be used***, how should this affect the planning process?
- How can a faculty be organised with a view to introducing a "new" programme?

Planning schedule concepts

The concepts both explicit and implied in this plan represent a radical departure from traditional practice in schools of health sciences If a school is to shift to the type of system described here, the transition must be regarded as a ***long-term (perhaps four or five years) project*** This suggests that.

- A plan for phasing from the old system to the new one should be developed.
- A series of intermediate objectives should be set with time deadlines
- The objectives should indicate which parts of the old system should be improved, which elements of the new system should be introduced, and in what sequence.
- The plan should be discussed with the teachers and appropriately revised before becoming institutional policy.

Sequence of steps (see pages 3.67 – 3.70).

The system proposed is hypothetical and should be used only as a means for beginning work on a system appropriate for any given school

*Adapted from a document by Dr. J. Hess, Wayne State University School of Medicine, Detroit, Michigan, USA, (1971)

A representative sequence of steps for planning and implementing a "new" programme

Action	Taken by	Obtain agreement from
1. Set up a working group (Programme Committee) with authority and responsibility to plan and co-ordinate a new programme. Members should be selected for creative abilities as well as for distribution among disciplines. In addition, students, practitioners and health administrators (central level) should be included.	Faculty Council	University administration; major power centres in the Faculty or School.
2. Prepare a written statement of overall objectives in terms of the functions that graduates should be able to perform, and a statement of the general philosophy of the programme	Programme Committee	
3. Obtain approval of the written overall objectives and the programme philosophy. Revise as needed to obtain agreement with the plan in principle	Approval to be given jointly by the Faculty Council and the Programme Committee	University authorities; major power centres in the School; Ministry of Health
4. Select the organising principles that will be used for planning the new programme Examples are: – competency base; – body systems in health and disease, – clinical problems base, – the processes of clinical medicine, – a preventive medicine model, etc. – community problem base, – programme with contract.	Programme Committee	

Action	Taken by	Obtain agreement from
5. Lay out a general sequence of programme phases in block diagrams or outline form based on: 5.1 Organising principles and philosophy of the programme 5.2 Assumptions and data concerning capabilities of incoming students; 5.3 Terminal programme objectives; 5.4 Available teaching resources.	Programme Committee	Faculty Council
6. Select the disciplines that should have major representation in each programme phase.	Programme Committee	
7. Organise committees of teachers for the main programme phases. Critical factors: 7.1 Those responsible for each phase should: (a) be able to advance convincing arguments in support of the programme philosophy, and (b) have demonstrated ability to get things done in committee. 7.2 Most committee members must be open-minded and ready to break with tradition. 7.3 Major disciplines mentioned in step 6 must be represented.	Programme Committee	Faculty Council Heads of Departments
8. Select teachers[1] to lead student groups.	Committee of Teachers	Heads of Departments

[1] The term "teacher" should be understood in its new sense, which includes senior students.

Action	Taken by	Obtain agreement from
9. Begin training sessions for committee members and the teacher-leaders of student groups. General subjects: 9.1 Educational philosophy and objectives; 9.2 Teaching concepts and methodology; and 9.3 Fundamental principles essential for the success of the teaching programme.	Programme Committee with assistance from education consultants from: (a) the University itself; and (b) other organisations.	
10. The requisite level (for students) and the intermediate educational objectives for each phase are prepared or reviewed by the Committee of Teachers. Preferred sequence: Begin with last phase prior to graduation and work back to entry point of programme.	Committee of Teachers following guidelines from the Programme Committee and education specialists.	
11. The objectives or plans for each programme phase are revised as necessary.	Teachers of the corresponding programme phase.	
12. Specific objectives are prepared and reviewed.	Teachers of the programme phase; Programme Committee	Heads of the Departments concerned
13. Teaching and evaluation methods (immediate and long-term) are selected and the required administrative support is planned and organised.	Teachers of the phase with the help of the Committees of Teachers and education specialists	Programme Committee and Heads of the Departments concerned
14. Teaching and evaluation methods are implemented.	Teachers of the phase with the help of the Programme Committee	Heads of Departments

Action	Taken by	Obtain agreement from
15. Evaluation results are collected. Data pertaining to individual student evaluation and evaluation of the teaching given are handled and interpreted separately through appropriate channels	Committee of Teachers and education specialists	
16 Recommendations for improving the programme are developed. They are based on the evaluation data and other sources of information and advice.	Programme Committee, Committee of Teachers, School Administration	Appropriate individuals and groups
17. The necessary changes are implemented	Programme Committee, Committee of Teachers	Faculty Council, Heads of Departments

qualities of a programme committee coordinator

He need not necessarily always have all the following qualities, but if you had to choose at some time or another between two colleagues it is suggested that you choose the one most resembling this description.

He should be:

- available
- motivated
- have the support of the school administration
- accepted by the students

and also have as many as possible of the following qualities:

- Vast knowledge and wide professional experience
- Recognised skill in educational planning
- The personality of a leader
- A reputation as a research worker
- Years of experience as a faculty member
- A reputation as an author

advantages and limitations of a systematic approach

Possible advantages of a systematic approach

1. It provides a mechanism making possible a study planned and organised in advance.

2 When it becomes really operational it should be more effective than the traditional approach since it can be improved by the feed-back

2.1 If it is well organised, it may permit greater flexibility in organising the use of time of students and teachers

2 2 Allowance can be made for certain individual variations in students' rate and mode of progress throughout the teaching programme.

2.3 It may prove possible to train more students at the same cost if the system is carefully structured.

Possible disadvantages

3 1 Teachers must spend more time on planning and evaluation, especially during the first years following the adoption of the system In many respects it is more expensive *at the outset* to try to construct a new system rather than to keep to the old one.

3 2 It seems clear that a nucleus of teachers will have to spend a greater part of their time in planning, managing and evaluating the programme These activities could be organised using a rotation system covering three or four years, so as to distribute the work and give teachers an opportunity to become familiar with the teaching methodology.

Necessary supporting elements

4.1 A school administration and departmental heads willing to delegate some of their responsibility and authority to a new programme planning and management system

4.2 Budgeting of funds in a manner consistent with the teaching programme and the distribution of decision-making authority

4.3 A review and, where necessary, a revision of academic regulations concerning the hierarchical system in operation and the promotion of teaching staff so that teachers' tontributions in planning and implementing the teaching system will be duly recognised when decisions are taken on salary increments and academic rewards.

4.4 A faculty council and a programme committee that are skilled in arranging to co-opt, "neutralise" or "remove" (by promoting, but elsewhere) key opponents to the plan

The object of education is not to shape citizens to the uses of society, but to produce citizens able to shape a better society.

To train large numbers without loss of educational quality

Promote and develop the use of self-learning methods and material

and

have students share teaching responsibilities*

The key to effective learning is to adapt learning activities to the needs of individual learners

*Cf. Students Learning From Students. WHO Document WHO/EDUC/80/181

specification tables

A *specification table*, or double-entry table, is a kind of check list enabling you, when you prepare a programme or an examination, for example, to make sure that the appropriate parameters have been taken into account. It sometimes happens that even the best-intentioned teachers who have made an effort to define educational objectives go on to prepare a programme or an examination which, when analysed, appears to neglect them completely. In order to "force" yourself to bear these objectives in mind, you would be well advised to make use of specification tables; they will help you to relate each part of the programme directly to a given objective. In other words, "every part of a programme or an examination should correspond to an objective", and "every objective should have a corresponding element in the programme or examination". *That is the price of relevance.*

How to use a Specification Table

One example of a specification table (p. 1 27) has enabled you to have a brief overview of both a teaching programme and a series of examinations.

A second example (p. 2.38) showed you how to compare different evaluation methods using selected criteria.

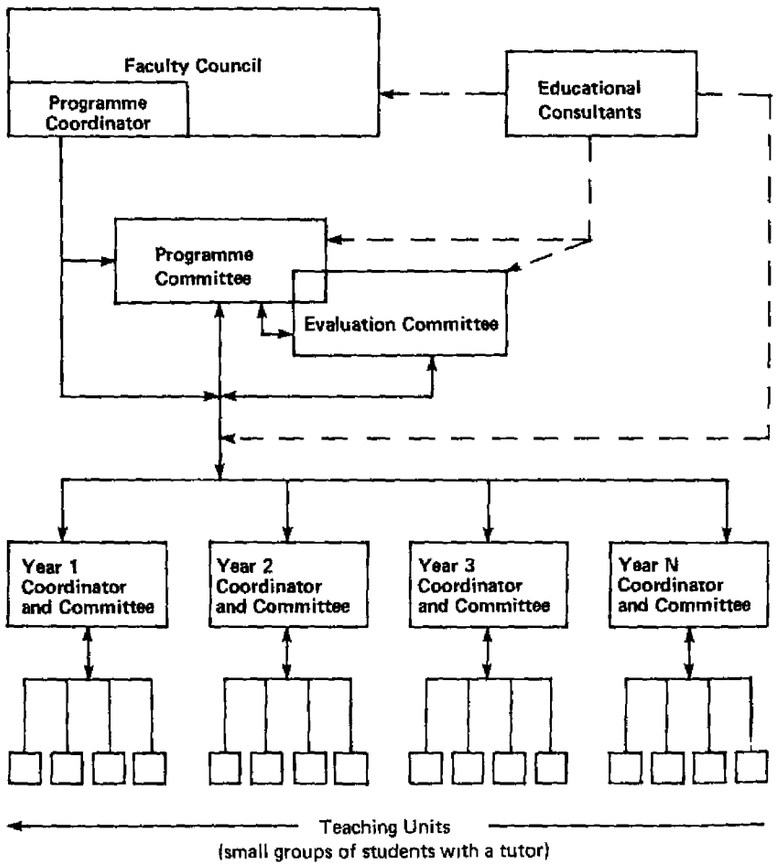
A third example (in this chapter, p. 3.58) has helped you to compare two teaching methods, using other selected criteria.

A fourth example will be given in the next chapter (pp. 4.54 – 4.57). By means of another exercise, you will be able to make a qualitative analysis of a series of tests (the exercises in the *Handbook*).

These four exercises will have allowed you to see what an extremely useful tool a specification table may be in educational decision-making.

Remember to construct one whenever that seems advisable.

Example of organizational chart of an integrated programme planning mechanism



Key: Solid lines represent direct lines of administrative decision-making
Dashed lines represent advisory functions

obstacles to change

- Dynamic conservatism
- Institutional bureaucracy's built-in resistance to change
- Complexity of programme change
- Lack of institutional resources
- Lack of model upon which to base changes

J. Bryant

Personal Notes

EXERCISE

Describe in chart form the type of organisation (commissions, committees, councils etc., with a list of the functions of each) which you think could be set up in the institution where you are teaching with a view to introducing (or improving) a *relevant programme*. Compare your chart with that on page 3.74.

The classically rigid, inflexible departmentalization of faculties of medicine is probably the greatest single obstacle to educational reform.

D. Maddison
Dean, Fac. of Med.
University of Newcastle, N.S.W., Australia

EXERCISE

Describe the obstacles you are likely to meet in setting up the type of organisation that you described on the preceding page, *and* the tactics you could use to overcome them.

Obstacles	Tactics

An educational system will never achieve its full potential in the preparation of health professionals if it continues to guard jealously individual and departmental autonomy and to maintain a lofty aloofness from the health care system.

G.E. Miller 1977

EXERCISE

(Check your answers on page 3.84)

Important: *Select only one reply to each question.*

Question 1

According to present educational trends, all the following statements are true. *except one*. Which one is false?

A. A systematic approach facilitates the choice of learning situations and evaluation methods.

B. The modern trend in educational practice is to transfer part of the teacher's role to the student.

C. Present educational trends seem to lay more stress on the student than on the teacher.

D. The student's judgment of the value of an educational programme is perhaps more valid than that of the teachers.

E. The primary role of the teacher is to transmit knowledge in the field of his specialty.

Question 2

Learning is made easier by an educational situation in which the teacher does all the following things *except one* Which is inappropriate?

A. The teacher encourages the student to be active.

B. The teacher helps the student to discover concepts.

C. The teacher makes frequent checks of the student's level.

D. The teacher encourages individual learning.

E. The teacher gets the student to participate in educational decision-making.

Question 3

The many definitions of learning include all the following characteristics *except one* State which.

A. A more or less permanent change occurs in the student's behaviour

B. It is not directly observable.

C. Repetition by the student is a favourable factor.

D The role of the teacher is primordial.

E Motivation is an essential element.

Questions 4 to 7

Indicate for each of the following questions whether reference is made to.

A. an epidiascope

B. an overhead projector

C. a slide projector

Question 4

Can project outlined figures (or letters) on a transparent support (25 x 25 cm) so that they can be read in a lighted room.

Question 5

Can project outlined figures (or letters) on opaque paper so that they can be read in a darkened room.

Question 6

Is also called a diascope.

Question 7

Can project outlined figures (or letters) on a transparent support (50 x 50 mm; 24 x 36 mm) so that they can be read in a darkened room.

Question 8

A self-learning package must include at least three of the following elements. Indicate which.

1. A short statement of the subject.
2. The statement of the educational objectives.
3. A definition of the required level.
4. The full documentation needed.
5. Diagrams, photographs or slides.
6. A formative measuring device.

Reply:

A if the elements are 1, 2 *and* 6

B ..... 1, 3 *and* 5

C ..... 2, 4 *and* 6

D ..... 3, 4 *and* 5

E ..... *any other choice*

Question 9

Upon which of the following criteria for the choice of teaching material does the quality of relevance depend?

The material should:

A. be appropriate to educational objectives;

B promote active student involvement;

C. be appropriate to the students;

D. be of good technical quality;

E be very cheap.

Questions 10 to 16

If a lecture course is denoted by X, and a self-learning package by Y,

Reply:

A if the method described is consistent only with X

B ..... *Y*

C ..... *with both X and Y*

D ..... *with neither X nor Y*

Question 10

A method which places the student in an active situation

Question 11

A method which allows the student to attain a given educational objective.

Question 12

A method which provides the student with a feed-back of information on his progress.

Question 13

A method which requires the student to work in a team.

Question 14

A method which allows the student to work at his own pace.

Question 15

A method which appears to be economical in time and in means.

Question 16

A method which emphasises self-measurement.

Question 17

Among the educational objectives to be reached by a class of 250 students of the same year is the following. "to be able to measure the height when lying down of a new-born baby using a portable scale". Criterium: maximum error of ± 0.5 cm in 90% of measurements.

Supposing that each student has to spend eight weeks in a MCH (Maternal and Child Health) centre in the course of his training, *list in order of decreasing efficiency* the following four teaching methods:

1. A 30-minute lecture to the 250 students in a lecture room, followed by a demonstration by the instructor.
2. A 30-minute lecture followed by practical exercises of the technique by the students in groups of 25, each group spending two hours with the instructor in rotation.
3. A demonstration of the technique by an instructor followed by practical exercises by the students in groups of 25, each group spending two hours with the instructor in rotation.
4. Each student receives a handout with diagrams during the training period, valid certifying tests are checked by the instructor on request by the student.

Reply:

A if the order of decreasing efficiency is	1 2 3 4
B	2 4 1 3
C	3 1 4 2
D	4 3 2 1

Question 18

When preparing a part of the programme whose aim is to stimulate the student's originality in looking for solutions to problems, the most suitable group of learning activities is:

A. The students participate in courses and demonstrations by teachers with a very creative attitude who are themselves excellent research workers.

B. The students participate in laboratory and field exercises during which they reproduce basic experiments.

C. The students participate in a series of hospital, field and laboratory activities, and must present the solutions arrived at in clear terms.

D. The students participate in hospital, field and laboratory activities and must write a report describing the experiments in which they have participated

Question 19

According to L. Weed, all the following statements are true *except one* Which is untrue?

A. Length of training should be fixed in advance for a given group of students depending on the type of degree.

B The student should be able to define his own work objectives within an organised system of medical care.

C. An understanding of basic principles should result from the students' confrontation with practical problems.

D. The lasting ability to recall depends for the most part on repeated use

Question 20

A programme specification table (double-entry table):

A. Is a table giving details of a teaching programme (time-table, premises, etc.)

B. Is a list of contents giving detailed instructions concerning programmed learning.

C. Is a control sheet for checking the specificity of the educational objectives.

D. Is a control sheet for checking whether the elements of the programme are related to the educational objectives

Suggested answers for the exercise on pages 3.77 – 3.83

Questions	Suggested Answers	If you did not give the right answer, reread the following pages.
1	E	3.05 – 3.12, 3.18 and 3.19
2	C	3.25 – 3.31
3	D	
4	B	3.42 – 3.47
5	A	
6	B	
7	C	
8	C	3.48 – 3.53
9	A	3.53
10	B	3.41 – 3.53
11	C	
12	B	
13	D	
14	B	
15	A	
16	B	
17	D	3.41 – 3.59
18	C	
19	A	3.62 – 3.66
20	D	3.74

Congratulations! You have attempted to work out a programme corresponding to your subject.

But be careful

- **Make sure once more that it agrees with the professional functions and tasks**
- **Pay unfailing attention to relevance**
- **Effective teaching can be more dangerous than no teaching at all if it is not really relevant**