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# UNIT 7 TEACHER-CONTROLLED INSTRUCTION

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## 7.1 INTRODUCTION

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In Unit 5 of Block 2 on Systems Approach you have studied about the relationship between teaching and instruction, and also between instruction and learning. You have also studied about input-process-output model of a system. In Unit 6, Block 2 on Instructional Objectives you have studied about various classes of objectives. In this unit you will learn about teacher-controlled instructional procedures. These procedures relate, on the one hand, to the 'process' component of a system and on the other, to various classes of objectives. Apart from these, this unit also relates to Units 15 and 16 of Block 4 titled 'Teaching Skills'.

There are many teacher-controlled instructional procedures and activities. This unit, however, deals with the four most important ones with a view to enhance your understanding for promoting learning among learners. Besides, it aims at developing your capability in using these procedures effectively and efficiently while teaching.

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## 7.2 OBJECTIVES

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After going through this Unit, you will be able to:

- describe the nature of lecture method;
- describe the skills the teacher needs for improving the quality of lectures;
- identify common defects of a lecture and suggest suitable measures to remove them;
- construct a scale to assess a lecture;

- describe the nature of a demonstration;
- identify common defects of demonstration and suggest suitable measures to remove them;
- develop criteria and scale for assessing demonstration;
- describe the nature of team teaching;
- discuss how team teaching can be organised under the prevailing conditions in schools;
- state merits and demerits of team teaching;
- describe the nature of activity-based instruction;
- describe and illustrate different types of teacher-based instructional activities;
- discuss the merits of activity-based instruction; and
- state the precautions that need be taken while organising activity-based instruction.

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### 7.3 TEACHER-CONTROLLED INSTRUCTION : THE CONCEPT

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The term “teacher-controlled instruction” refers to teacher directed instructional activities and procedures to impart knowledge, skills and attitudes. Obviously, the teacher plays a pivotal role in this type of instruction. He carries out instructional planning and its implementation. However, he determines the activities that students have to be engaged in during the process of instruction. There is, however, a widespread misconception that teacher-controlled instruction leads to a rigid situation wherein the freedom and creativity of his students remain undeveloped. This is definitely not true. In fact, teacher-controlled instruction is a practical form of teaching in the present context. If properly implemented, teacher-controlled instruction makes teaching and learning more structured and systematic, without imposing any restriction on the students’ thinking and activity.

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### 7.4 LECTURE METHOD

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Of several methods of teaching, the lecture method has so far been the most widely used at the secondary and senior secondary levels. Its effectiveness depends mainly upon the communication skills of the teacher.

#### 7.4.1 Nature of Lecture Method

The lecture method owes its popularity to its seeming simplicity and flexibility. It enables a teacher to teach even large classes and cover larger content during a given period in comparison to other methods. Through the lecture method a teacher is able to provide an overview of the course unit or topic alongwith background knowledge essential for understanding it. Besides, he can provide a large number of facts and clarify terms, concepts, principles, theories, etc., thereby promoting their comprehension and their use in problem solving.

A teacher following the lecture method prepares a lesson on a topic and delivers a talk in the class. The speed of delivery (i.e. pace of the lesson) and illustrations used to clarify various terms and concepts, are determined by the teacher, depending upon his assessment of the learning capabilities of average students. The teacher presents the subject matter without any interruption. The role of the students in lecture method is to listen to the teacher, take notes and list difficulties, if any. They seek clarifications from the teacher generally at the end of the lecture.

From the brief account given above, it is evident that the lecture method is characterized by the following features:

- It is a teacher-centred method of teaching. The teacher plays more active role in the process of instruction.
- It makes use of one-way communication. In this method, the students play a relatively passive role, that of listeners.

### 7.4.2 Lecture-based Teaching Skills

In lecture method, the teacher talks most of the time. Acquiring mastery of skills and components of the lecture can help improve the teacher's performance. One of the most important skills in this context is modulation of voice/voice variation. This skill has several dimensions viz., speed, pitch, volume, intonation, etc., of the voice. To bring about a better understanding, these components, have been explained as follows:

- **Speed** refers to the rate of vibrations of voice cords during speech.
- **Volume** refers to the degree of loudness of the speech.
- **Intonation** refers to the rise and fall of voice in speech caused by variation in pitch. The meanings of concepts, terms, ideas, etc., are provided not only by words and grammatical constructions but also by intonation patterns employed by the teacher.

A teacher can effectively modulate his voice by acquiring mastery of these components. The teacher should modulate his voice according to that he wants to communicate to the students. That is to say, a lecture is always more effective when the teacher lays proper stress on various words and phrases.

One of the main characteristics of lecture method is that it is based on one-way communication. A major problem that a teacher faces during lecturing is to sustain the attention of the students. He can overcome this problem by acquiring competence in the skill of stimulus variation. Stimulus variation can be achieved through frequent variations in the style of presentation of subject matter, media, interaction pattern, etc. This breaks down monotony and facilitates students' learning. The skill of stimulus variation has eight components. A brief description of these components is given as follows:

- i) **Movements:** While lecturing, the teacher should not stand at one place continuously, but should change his position at short intervals. This is so because if the students have to look continuously towards the teacher standing in one position, their eyes get tired; this in turn causes loss of attention.
- ii) **Gestures:** Gestures consist of movements of hand, head, eye and facial expressions, for expressing or illustrating an idea, an emotion or a feeling. Depending on the purpose, the teacher can decide whether a gesture is to be made by the hand, head or eye, or through a combination of two or more of these simultaneously.

Gestures are helpful in making verbal communication effective. The teacher can make use of gestures to draw attention, to emphasise the importance of a particular point or idea, to illustrate feelings, to indicate shapes, sizes and movements of objects.

- iii) **Modulation of voice:** The components of 'modulation of voice' have already been discussed. It is sufficient to state here that appropriate modulation of voice by the teacher is helpful in sustaining students, attention. This is so because the use of voice without any variation induces monotony among students, resulting in loss of attention.
- iv) **Focusing:** Focusing behaviours are of three types. A brief description of each is given below:
  - **Verbal focusing :** It is used for securing attention of the students through statements such as 'Look at the diagram/table/figures', 'Listen to me carefully; I am going to describe an important feature', 'Watch what happens when red litmus paper is placed in an alkaline solution', etc.
  - **Gestural focusing :** The teacher secures attention of his students through certain gestures. Examples of gestural focusing are underlining of important words or statements written on the blackboard, pointing out important features of a diagram; figure and graphic presentation, with a point.
  - **Verbal-cum-gestural focusing :** In this type of focusing, the teacher makes use of both verbal statements and gestures for drawing attention of the students to the important points. Pointing towards the diagram while saying 'Look at the diagram carefully' is an example of verbal-cum-gestural focusing.
- v) **Pausing:** In the context of teaching, pausing means deliberate silence for a short interval introduced during lecturing. The teacher introduces pause(s) to draw attention of the students to something important.
- vi) **Audio-visual switching:** For making his lectures interesting and to sustain student's attention, the teacher may shift from one medium to another after appropriate intervals.

For example, after delivering a talk for some time, a teacher may show slides or a video programme to illustrate his talk. This may again be followed by a lecture. Such a procedure ensures that one medium is not used continuously because it leads to monotony and thus distraction.

- vii) **The skill of explanation:** During the course of lecturing the teacher has to make clear the meaning of terms, concepts, situations, etc. Again, he has to describe objects, procedures, processes, etc. Still again, he has to provide explanations, based on cause-effect relationship. **Explanation** is thus a skill that affects the quality of teacher's communication through verbal medium. You should, therefore, acquire competence in the use of this skill.

The following components of the skill of explanation contribute to bearing on the quality of lecturing:

- Using appropriate beginning and concluding statements: The teacher at the beginning describes precisely what he is going to explain. This motivates the student to pay attention to what he is going to learn. The concluding statements on the other hand, provide a logical structure of whatever the teacher has explained.
- Using explaining links: For describing interrelationships among various aspects of a process or an event, a teacher has to use some explaining links/link words. These are generally words and phrases that provide continuity in the statement. The use of link words make explanations clear and coherent. Some of the commonly used link words are as under:

because	though	if...then
in order to	therefore	the implication of
since the cause	hence	the purpose of what
	so this is how	if

- Covering essential points: This refers to the critical features and important landmarks of whatever the teacher is trying to communicate.
- viii) **Avoiding undesirable behaviour:** While explaining, the teacher has to avoid certain behaviours which hinder understanding by the students. These behaviours are :
- irrelevant statements
  - lack of continuity
  - lack of fluency, and
  - inappropriate vocabulary

#### Illustration with example

While lecturing, the teacher should describe concepts, principles, theories, etc., with the help of examples, Effective illustration with examples, can make lectures more communicative and meaningful. Various components of this skill are:

- Formulation of simple, interesting and relevant examples.
- Use of appropriate media for presenting examples.
- Use of appropriate approach for presenting examples.

In sum, it may be stated that there are a number of skills that can improve teacher's talk and thereby the quality of lecture. However, the most critical ones seem to be modulation of voice, skill of stimulus variation, skill of explaining and skill of illustrating with examples.

### 7.4.3 Common Defects of Lecture Method

Some common defects of the lecture method may be classified under two categories : those which relate to the nature of the lecture method, and those which make communication ineffective. The defects falling under the first category are as under:

- In lecture method the student's participation is the least. This often makes the teaching-learning process dull and ineffective.
- Because of one-way communication, this method makes students mere passive listeners.
- It does not encourage students to become inquisitive and explorative. It makes them dependent upon the teacher and his notes. In other words, lecture doesn't develop student's capabilities of 'learning to learn'.

- This method doesn't provide a mechanism for the teacher to obtain feedback from students on the effectiveness of his teaching.

The defects of the lecture method falling in the second category are:

- Poor command over language;
- Providing too many facts without linking them properly to a concept, generalization, theory, etc.;
- Use of ambiguous words;
- Poorly structured lecture:
- Lack of logical and psychological sequence in the various parts of the lesson;
- Use of monotonous voice during lecture; and
- Distracting mannerism. For example, very frequent use of phrases like 'You see', 'O.K.', 'I mean', etc., distracts the student's attention from the learning process.

**Suggested improvements:** To bring improvement in the use of the lecture method, the following suggestions can be useful:

- Success in lecturing depends on its appropriate planning. It is, therefore, essential that the lecture be planned properly.
- Before planning the lesson, the teacher should try to collect as much information as possible about the entry level behaviour of the students. Entry level behaviour refers to the amount of knowledge and skills, experiences, attitudes, aptitude, competence in language, etc. that the students possess. This background information helps the teacher in framing appropriate instructional objectives, selection of content, teaching – aids and proper structuring of the lecture.
- Effectiveness of a lecture increases if it is properly structured. Structure of the lecture relates to the arrangement of the key concepts/points to be dealt with. Brown (1978) compares a set of key points with the keys in music. Just as by changing the order of keys in music one can provide variations upon the theme, changing order of key points results in a different structure of a lecture. Brown classifies a lecture into five main types. A brief description of each is given below:
  - i) **The classical lecture:** A classical lecture is divided into broad sections. Each section is further divided into sub-sections, which in turn are divided into smaller segments. Each sub-section contains a key point to be explained and illustrated. The whole structure of the lecture may be diagrammatically represented in a hierarchical form.
  - ii) **The problem-centred lecture:** This lecture is structured around problems. In this lecture, the teacher first makes the problem clear and identifies the issues and related components of the problem. For arriving at the solution each issue is thoroughly examined by the teacher. Alternative solutions to the problems are also critically examined in the light of available facts and evidence. At the end the teacher summarizes the information into a coherent structure.
  - iii) **The sequential lecture:** This kind of lecture consists of arranging the subject matter in a sequential form leading usually to a conclusion. This type of lecture is used in teaching almost all subjects. The teacher may sequence the subject matter in a logical or psychological order. While sequencing the subject matter in a logical order, the teacher takes into account the inherent structure of the subject but in a psychological order the main consideration is how best the students can understand the subject matter.
  - iv) **The comparative lecture:** The comparative lecture is based on comparison of similarities and dissimilarities of different ideas, views, characteristics, etc., on some criteria. Such a lecture can be applied to different subjects such as Economics, History, Literature, etc. Before using this variety of lecture, the teacher should make explicit the criteria to be used for comparison and contrast.
  - v) **The thesis lecture:** This lecture begins by presenting a proposition such as privatisation of Indian economy which will help solve major economic problems. This is followed by presentation of a wide range of evidence and arguments that support or reject the assertion. Towards the end the evidence and arguments are summarized and conclusions are drawn.

It may be mentioned here that the above classification is not a rigid one. It has been described with a view to enhancing your understanding of the structure of lectures.

Depending upon your needs you may use one or more than one category for structuring your lecture.

- Effectiveness of the lecture method depends to a great extent on the capability of the teacher to secure and sustain attention and interest of the students. As stated earlier, you should acquire competence in the skill of stimulus variation which consists of movements, gestures, modulation of voice, focusing, pausing and audio-visual switching.

Several devices are available for making the students interested in the lecture. Telling the students at the beginning of the lecture why the lesson is important, pointing out some key concepts that they need to attend to for comprehending the lecture, relating the instructional material to the personal or societal context, etc., are some example of these devices.

- Effectiveness of a lecture also depends upon your competence to communicate your intent to the students. The process of communication relates to designing of message by taking into account the entry level behaviour of your students, delivery of the message through an appropriate medium, reception of the message without any distortion and feedback about whether or not the students have comprehended what is taught. You should attend to all these aspects of an effective lecture.

While delivering the lecture, you should pay special attention to its three parts viz., introduction, the message, and closure. During introduction, you should make clear what you expect of the students at the end of your lecture. Alternatively, you may announce the main idea/major concepts which you want your students to learn. While dealing with the subject properly, you should explain the concepts, provide enrichment materials, support your contention with arguments, etc. At the end of the talk you should summarize the main points of the lesson. Your students will be able to retain the main points for a longer period if you highlight them adequately in your lecture.

Proper reception of the message depends upon the physical conditions of the classroom and psychological conditions of the students. The physical conditions comprise seating arrangements, acoustics of the classroom, temperature, condition of the blackboard, etc. The psychological conditions relate to the motivational level of the students during the lecture. For proper reception of the message, you should provide comfortable physical and supportive psychological environment to your students.

For maintaining a student's attention, you should not only be enthusiastic about your lecture, but also keep your students entertained. For doing this you should, among other things, make use of humour, provided it has educational value and is not out of place. Humour relieves monotony of listening. Apart from this, you should maintain rapport with the students by maintaining occasional eye contact with all the students in the classroom.

As already pointed out, the role of the students in a lecture is to listen, observe and take notes. The effectiveness of lectures can be increased if the students are trained in the use of these skills. Unfortunately this aspect has remained neglected in our schools so far and therefore it needs to be attended to.

In the lecture method, you cannot obtain feedback directly from the students. However, you can get feedback indirectly by observing the behaviour of your students during the lecture. Loss of attention, yawning, sleepiness, mischief, etc., among students indicate that they have lost track of the lesson. You can take corrective measures by identifying the cause(s). Another method of obtaining feedback is through student's answers to your questions. You should keep sufficient time at the end of the lesson to ask questions. The nature of questions asked by the students and their answers to your questions reflects how far the lecture has been effective.

#### 7.4.4 Assessing Lecture

The quality and effectiveness of a lecture may be assessed with the help of a Lecture Appraisal Scale. It is a seven point appraisal scale. Its items are based on the views of experts about what constitutes a good and effective lecture. You can use this scale to assess the quality of your lecture.

##### Lecture Appraisal Scale

- (1) Name of the teacher :
- (2) Title of the lecture :
- (3) Date :
- (4) Assessed by :

## Instructions

Assess the performance by encircling the number which most closely indicates your assessment of teacher's performance on each of the following items.

Description of components	Extremely weak	Very weak	Weak	Average	Good	Very Good	Excellent
1. Introduction aroused student's curiosity and interest in the lecture	1	2	3	4	5	6	7
2. Content was organised effectively	1	2	3	4	5	6	7
3. Explanations were clear and coherent	1	2	3	4	5	6	7
4. Examples were simple and meaningful	1	2	3	4	5	6	7
5. Pace of presentation was appropriate	1	2	3	4	5	6	7
6. Established good rapport by focusing eyes on students and using other devices	1	2	3	4	5	6	7
7. Varied the stimuli appropriately to sustain student's attention	1	2	3	4	5	6	7
8. Modulated the voice effectively	1	2	3	4	5	6	7
9. Vocabulary used was appropriate and within the comprehension of the students	1	2	3	4	5	6	7
10. Summed up the theme of the lecture effectively	1	2	3	4	5	6	7
11. Provided sufficient time to the students to clarify doubts at the end of the lecture	1	2	3	4	5	6	7

(Developed by Dr. M.S. Bawa for Deptt. of Education, University of Delhi.)

### 7.4.5 Model Lecture-based Lesson : An Example

The following is an example of a lecture-based lesson.

Today we shall discuss the problem as to how India can meet her ever growing need for increased agriculture production. For finding a solution to this problem we shall have to discuss the following related problems.

- What is meant by extensive and intensive cultivation?
- Whether agricultural production in India can be increased through extensive or intensive cultivation?
- Why intensive cultivation is not possible in areas dependent on monsoon for irrigation.
- How can the expansion of irrigational facilities promote intensive cultivation and thereby bring about a consequent increase in agricultural production?

There are two ways of increasing agricultural production:

- Extensive cultivation, and
- Intensive cultivation

Let me first of all explain the meaning of these two terms (introductory statement).

“Extensive cultivation” is a method in which increase in agricultural production is brought about by bringing more land under cultivation. On the other hand, “intensive cultivation” is a method in which increase in agricultural production is brought about by use of more labour and materials on the same piece of land. By material we mean such resources as water, better seeds, chemical fertilizers, etc. **(Explanation)**

Thus we see extensive cultivation relies on extension of the area for bringing about an increase in agricultural production whereas intensive cultivation brings this through more use of labour and materials on the same piece of land than before **(concluding statement)**.

Having known the meanings of extensive and intensive cultivation, let us first consider the possibility of increasing agricultural production through extensive cultivation, (introductory statement). As India is an over-populated country, there is not much scope for bringing new land under cultivation. Not to speak of extension, in the years to come, the area of land under cultivation is likely to decrease. This will be so on account of the economic development which necessitates diversion of agricultural land from agricultural use to non-agricultural use such as for building of roads, rail tracks, factories, etc. As India progresses in development, land under development projects is bound to increase thereby reducing area of land available for cultivation. **(Giving reasons)** Thus increasing agricultural production through extensive cultivation in India is not possible **(Concluding statement)**.

The other possibility for increasing agricultural production is through intensive cultivation. Let us now examine whether in those areas which are dependent on monsoon rainfall, intensive cultivation is possible. **(Introductory statement)**, One of the most important pre-requisites for intensive cultivation is the availability of assured water supply to the farmers. Wherever this is available, farmers will be bringing about improvements in land and also make use of such inputs as chemical fertilizers, better seeds, pesticides, etc. In its absence, they will not invest in these inputs. In India most of the agricultural land does not get assured water supply through monsoon because of its following two characteristics: First the monsoon rainfall is unevenly distributed. For example, 30% of the total land area receives a rainfall less than 75 cms, 60% between 75 cms and 185 cms, and over 185 cms. is received by the remaining 10% of the area. From these figures it is evident that only a small percentage of total area gets plentiful and assured rainfall while a greater percentage of area gets insufficient and scanty rainfall.

**Secondly**, monsoons are of uncertain character. In some years, there is too much rainfall, resulting in destruction of crops.

In other years the rainfall is too little leading to drought conditions. As a consequence there is failure of crops. Even during the year when the rainfall is free from these two extremes, it cannot assure adequate supply of water to farmers; they have no control over it. They are likely to get more quantity of water than is needed and that too at inappropriate times. Thus because of these characteristics, the monsoon in India does not provide a sure supply of water to the farmers. This source is, therefore, unsuitable for intensive cultivation. In contrast, expansion of irrigation facilities can supply assured and timely water supply to the farmers. **(Supporting one's contention with facts and arguments)**.

In conclusion, it may be said that as monsoon rainfall cannot ensure needed water supply to the farmers, it does not promote intensive farming. **(Concluding statement)**.

Let us now examine how expansion of irrigation facilities promotes intensive cultivation and thereby brings about a consequent increase in agricultural production **(Introductory statement)**.

This increased control over water resources helps in intensive cultivation in the following two ways:

Firstly, expansion of irrigation facilities makes possible double or multiple cropping. In other words, the farmers can grow two or more than two crops in place of one crop.

Secondly, expansion of irrigation facilities promotes the use of other inputs like better seeds, chemical fertilizers, etc. Consequently, productivity per hectare of a crop increases tremendously. **(Giving reasons in support of one's contention)** In sum, we can say that expansion of irrigation facilities makes possible intensive cultivation and thereby increases agricultural production **(Concluding statement)**.

Let me summarize the main themes of my talk. At first I distinguished between extensive and intensive cultivation. Whereas, under extensive cultivation more land is brought under cultivation for increasing production, under intensive cultivation, the increase agricultural production is brought through the use of more inputs like better seeds, fertilizers, pesticides, etc. on a given piece of land. Secondly, I put forward the thesis that in India increase in agricultural production can be brought about through intensive cultivation, and not through extensive cultivation. Thirdly, I discussed the proposition that intensive cultivation is not possible in areas which are dependent upon monsoon for water supply. The main reasons given were that monsoon cannot ensure timely and right quantum of water supply. Lastly, the case for expansion of irrigational facilities for raising agricultural production was made out.

You may now get your doubts clarified.

**Check Your Progress 1**

**Notes :** a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

i) List three components of teacher-controlled instruction?

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 .....

ii) List five types of lecture.

.....  
 .....

iii) State the components of all the four important lecturing skills .

.....  
 .....

**7.5 DEMONSTRATION**

The demonstration method is effective for developing skills in students. The demonstration method is of immense importance in developing a variety of skills in the students. Besides, it facilitates understanding of principles, theories, etc., of a discipline by the students. Imagine a lesson on properties of light being taught to the students without demonstration.

**7.5.1 Nature of Demonstration**

Let us understand the meaning of the term demonstration. Demonstration is a talk or explanation by someone who shows you how to do or use something or how something works. Demonstration means:

- The method or process of presenting or establishing facts.
- The procedure of doing something in the presence of others either as a means of showing them how to do it themselves or in order to illustrate a principle to support this presentation. For example, how to prepare a food product, or performing an experiment in front of a class to show that metals expand under heat. If you demonstrate something to someone, you show him by doing it practically and giving explanations alongwith the performance of the activity.

It will not be out of place to mention here that demonstration forms the basis of demonstration method which is widely used in the teaching-learning process. The demonstration method relies heavily upon showing the student a model performance that he should be able to reproduce.

Demonstration may be presented either live or electronically. The demonstration method provides for practice with real equipment or simulators and evaluates student performance in comparison with the demonstrated standard.

The term 'demonstration' and 'demonstration method' are similar as both of them emphasize showing/illustrating something to promote understanding among students. The two, however,

differ from one another. In demonstration method the emphasis is laid on showing **model performance** that the student is expected to match or surpass after practice under simulated or real conditions. Demonstration relates to the process of presenting or illustrating something. Thus the evaluation of what the students have learned from 'demonstration' forms part of the 'demonstration method'.

**Objectives of demonstration:** The main objectives of demonstration are to show how some thing is performed, happens or works.

**Demonstrating strategies:** While presenting a demonstration, you use either lecturing or inquiry or both. While using lecturing, you have to maintain the interest and attention of the students by telling them, what to look for, what is likely to happen, and why things happened as they did. Through inquiry, you promote the skill of inquiry among students by asking questions such as: "What do you observe?", "What will happen if a lighted match stick is inserted in a jar containing oxygen?", "Why do you think so?", etc.

**Role of the teacher:** Your role as a teacher in demonstration method of teaching is to plan, organize and execute the demonstration properly so that the students understand the concepts clearly. The quality of demonstration depends on the amount and quality of preparation made by you.

**Role of the students:** The role of the students in demonstration is to observe, listen and follow the demonstration. Demonstration requires the use of the sense of hearing and seeing. It leaves vivid and lasting impression on the students' minds. In addition, the students are required to answer different types of questions : lower and higher order and replicate the performance. It needs to be mentioned here that for showing standard performance, the students need practice under feedback conditions. The appropriate outcome of practice, however, is improvement rather than perfection.

In the context of teaching, demonstration or the demonstration method is used for various purposes. First, it is used for enhancing understanding of concepts, principles, theories, etc. Second, it is used for development of intellectual skills like observation, questioning, explaining, hypothesising, inferring, etc. Third, it can be used for the development of psychomotor skills like playing a musical instrument, drawing maps, diagrams, figures, tables, graphs, dissection of animals, etc. It is also used for developing skills of fixing up and operating of audio-visual devices, such as an overhead projector, a slide projector, a film projector, etc. In teaching sciences, demonstration develops appropriate skills for conducting experiments independently. As you know, psychomotor skills consist of several operations arranged in a sequence (Refer to Unit 6). The demonstration method plays a vital role in teaching these skills. Lastly, demonstration by providing models (c.f. 7.4.5) helps in acquiring complex techniques or skills like resolving conflicts, effective lecturing, effective organisation, managing an unruly class, speaking and listening skills, particularly in languages, etc.

On analyzing the meanings and the ensuing discussion the following characteristics of demonstration stand out. It

- involves teaching by doing;
- makes it easier to learn concepts, principles, complex techniques and skill-intellectual as well as psychomotor;
- lays foundation for independent practice by the student; and
- involves considerable preparation on the part of the teacher before presentation.

### 7.5.2 Common Defects

The common defects from which demonstrations suffer are the following:

- i) The teacher may not attend to the seating arrangement of the students and the location of the worktable. As a result of this neglect, sometimes some students may not be able to see the demonstration and hear the teacher.
- ii) Before giving demonstration, the teacher does not go for adequate rehearsal. This may result in clumsy and sub-standard performance.
- iii) The objectives of demonstration may not be stated properly at the beginning. This diminishes the effectiveness of the demonstration.

- iv) During demonstration, participation of the students may not have been sought. This results in loss of attention on the part of the students which in turn causes poor learning.
- v) The teacher may not recapitulate holistically important activities of the demonstration. Negligence of this aspect leads to loss of an opportunity to strengthen cognitive structure of the students.
- vi) The teacher may not evaluate achievement of the students at the end of demonstration. Consequently, he/she will be unable to get feedback regarding effectiveness of the demonstration. This in turn constrains him/her from effecting improvements in demonstration.

### 7.5.3 Measures to Improve Demonstration

The following measures are being suggested for effecting improvement in giving demonstration.

- You should properly arrange all the materials to be used during demonstration on the table, in the order in which they will be used, so that they can be picked up easily when needed. Such a practice brings to the notice of the students the efficiency of the preparations.
- You should make proper seating arrangements of the class and the location of the demonstration table in such a manner that everyone is able to see the demonstration and hear you clearly.
- You should at the beginning of the demonstration state the objectives to be achieved. This is recommended because it secures interest and attention of the students in the demonstration. Moreover, the practice makes both the teacher and the students responsible / accountable for achieving the objectives.
- Demonstration should be given in such a way that it is neither too fast nor too slow. In other words, it should be given at a reasonable pace, considering the learning capabilities of the students.
- You should utilize short time intervals during demonstration for providing useful information or answering questions.
- You should draw the attention of the students to the critical features of the demonstration. For example, while demonstrating to the students how a map of India should be drawn, you may point out that India's southern coast line is indented and that the coast line is always outlined in black. It will be better if you state what is going to be done before performing the action. This will help you in securing the attention of the students to the particular step in the demonstration.
- Lastly, the main points of demonstration should be recapitulated or highlighted at the end of demonstration.

You should remember that showing readymade aids is not a demonstration. A teaching activity is demonstration only when you 'do' or 'perform' with some physical activity of your own.

### 7.5.4 Criteria for Assessing Demonstration

In sections 7.5.2 and 7.5.3 the common defects and measures to improve demonstration have been discussed. A critical examination of these defects provides the criteria for assessing demonstration. Two major criteria for assessing demonstration are:

- Effective presentation; and
- Efficient presentation

Please refer to the Scale for Assessing Demonstration (SAD) given in the box for assessing the effective presentation the items appearing at serial numbers 3, 4, 5, 8, 9, 10, 11, 13, 14, 15 and 16 have been included in the Scale for Assessing Demonstration (SAD). For items appearing at serial numbers 1, 2, 6, 7, and 12 in SAD deal with assessment of efficient presentation.

#### Scale for Assessing Demonstration (SAD)

- (i) Name of the teacher :
- (ii) Topic :
- (iii) Date :
- (iv) Assessed by :

Encircle the number most closely indicates your assessment of the teacher's performance on each of the following components/items.

S. No.	Description of components	Extremely weak	Very weak	Weak	Average	Good	Very Good	Excellent
1.	The equipment, materials, etc., to be used in demonstration were orderly placed.	1	2	3	4	5	6	7
2.	Seating arrangement made possible for all the students to see demonstration and hear the teacher clearly.	1	2	3	4	5	6	7
3.	Demonstration was well-planned.	1	2	3	4	5	6	7
4.	Objectives of demonstration were clarified before giving demonstration.	1	2	3	4	5	6	7
5.	Critical points, where special attention was required, were explained to the students prior to demonstration.	1	2	3	4	5	6	7
6.	Various operations were performed efficiently, without fumbling and confusion.	1	2	3	4	5	6	7
7.	Various operations involved in demonstration were carried out in an orderly sequence.	1	2	3	4	5	6	7
8.	Students' attention was focused on important features/aspects of demonstration through suitable devices.	1	2	3	4	5	6	7
9.	Active participation of the students was sought in terms of setting up equipment, observation of phenomenon, explaining causes, drawing inferences, etc., during demonstration.	1	2	3	4	5	6	7
10.	Media, (live, audio-tapes, slides, films etc.) used during demonstration were appropriate.	1	2	3	4	5	6	7
11.	Strategy used for demonstration was appropriate.	1	2	3	4	5	6	7
12.	Short time intervals during the process of demonstration were used for providing useful information.	1	2	3	4	5	6	7
13.	At the end of the demonstration, main features of the demonstration were highlighted.	1	2	3	4	5	6	7
14.	Attainments of the students were evaluated through questions.	1	2	3	4	5	6	7
15.	Demonstration was well executed.	1	2	3	4	5	6	7

### 7.5.5 Demonstration-based Model Lesson

The following is a model lesson based on the demonstration method of teaching. But remember that this is an example and not the sole method to plan a lesson for demonstration.

Class : IX

Time : 10 Minutes

Topic : Demonstration to prove adulteration in a sample of Ghee.

The teacher comes to the class with the following equipments systematically arranged in a tray.

Spirit lamp, match box, a bottle of concentrated HCl (Hydrochloric Acid), a pinch of sugar, test tube stand, holder, etc., along with a sample of ghee to be tested.

The teacher makes seating arrangement of the class in such a way that the demonstration is visible to all the students and they are able to hear the teacher clearly.

Teacher (T.A.): You know that unscrupulous traders adulterate ghee by mixing vegetable ghee (Vanaspati) in it. Today I shall demonstrate to you whether or not the sample (displays test tube containing sample of ghee) is adulterated (statement of the objective). The theory underlying this demonstration is that vanaspati ghee contains a compound called "Sesame oil" which on reacting with concentrated HCl forms a complex crimson coloured compound. Let us conduct the experiment (statement of what is going to be done). What does this test tube contain?

Student (S.A): It contains ghee in solid form.

T.A.: Let us at first melt it by heating (Teacher seeks the help of a student in lighting the spirit lamp). The teacher fixes the test tube on the holder and heats it. (The teacher had rehearsed these activities before demonstration).

What do you observe now?

S.A. : The ghee has melted.

T.A.: Now I'm going to add an equal amount of concentrated HCl and a pinch of sugar (while performing this activity the teacher puts off the spirit lamp, taking care that all along the demonstration he/she does not lose eye contact with the class).

Now he shakes the mixture well for a minute. Can somebody lend me a hand at it (involves a student in shaking the test tube).

After shaking the mixture for one minute we would let it stand for five minutes.

(The teacher makes use of the interval of five minutes in describing other forms of adulteration and the processes of their detection).

Do you notice any change?

S.A.: Yes, there is crimson colour at the bottom.

T.A.: Right ! What do you infer?

S.A : The sample of ghee is adulterated.

T.A.: Good, Why do you say so?

S.A.: We have already learnt that Vanaspati ghee contains sesame oil which reacts with HCl. As the crimson colour has appeared, it shows that ghee has been adulterated with Vanaspati ghee.

T.A.: (Repeats the same test for pure ghee to show that crimson colour does not appear in this case.) Thus, the test that we have conducted detects whether or not sesame oil is present in the mixture. It is detected by adding concentrated HCl and a pinch of sugar in melted adulterated ghee. The test which detects the presence of sesame oil is called **Bodouoim test** (recapitulation).

How is Bodouoim test conducted? (evaluative question)

S.A. : (Student will explain the process and the result of the test conducted).

**Check Your Progress 2**

Notes : a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

i) What are the defects in the demonstration method.

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ii) What are the criteria to assess the demonstration method.

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## 7.6 TEAM TEACHING

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Team teaching is based on the assumption that no single teacher possesses expertise to do full justice to the entire course. As against the usual practice of teaching the full course in a subject by single teacher, team-teaching requires cooperation of two or more teachers to provide instruction in the areas of their expertise in the subject. This method is best suited for providing instruction to the students in interdisciplinary subjects like sciences, social sciences, etc., at different levels.

### 7.6.1 Nature of Team Teaching

Team teaching has been defined in a variety of ways. Team teaching is a method of instruction in which two or more teachers organise to provide instruction to a large group of students in flexibly varied ways best fitted to learning tasks. In team teaching the teachers work as a co-ordinated team under the direction of a team leader who allocates the teaching load and co-ordinates the work of the individual teachers. The teaching group varies in size and composition according to the nature of the teaching activity or the objectives to be achieved. Talented teachers are engaged in team teaching to get optimum advantage. Team teaching in this sense is a highly organized activity demanding total co-operation and understanding of the teachers involved, sharing of ideas, and evolving common methods of working.

Team teaching is a type of instructional organisation involving teaching personnel (includes other academic also, such laboratory incharge, librarian, sport teacher, media person, etc.) and the students in which two or more teachers share the responsibility of providing instruction to students. Thus team teaching combines three elements: (i) a distinct student group (ii) a small faculty group responsible for teaching the student group, and (iii) certain persons who assist the teachers and the students.

**Characteristics of team teaching:** The following are the main characteristics of team teaching:

- It is a flexible instructional organization. It provides for variety in instructional procedures, assignments, scheduling, grouping, etc.
- It binds the teachers, students and other academic personnel in a working relationship with a view to enhance effectiveness of teaching.
- A group of teachers shares the responsibility of planning, organising, leading, controlling and evaluating teaching of the same group of students.
- Even though team teaching is group-oriented, it protects the professional autonomy of the individual teachers in classroom. You are free to use strategy(ies) of teaching on the basis of your judgement. This, however, doesn't prevent you from consulting others and seeking their advice. In other words, team teaching protects the sovereignty of a teacher in classroom.

## 7.6.2 Types of Team Teaching

There are several types of team teaching. Shaplin (1967) grouped them into four categories:

- Two or more teachers appear to work together as associates, meeting occasionally and dividing up the responsibilities for instruction so that a minimum joint activity is ensured. This form of team teaching represents one extreme.
- Second, the key work here is **co-operation** which forms the basis of team teaching. It emphasizes co-operative group planning, group discussion and allocation of work.
- Third, where there are many members in a team, one of the teachers is made the coordinator. He is assigned responsibilities like coordinating the activities of the team members, establishing smooth working relations in the team, etc.
- Fourth, there are highly organized teams with several levels of responsibility, including team leaders, senior-teachers, teachers and visual-aids personnel all organised in an hierarchy of formal responsibilities with prescribed status and roles.

Considering the present state of affairs in India, it is advisable to start with the first two types of team teaching. With the introduction of the first type of team teaching, the teachers teaching at the secondary level would be able to meet each other in groups and discuss their common curricular problems and jointly plan, implement and evaluate certain portions of the curriculum. The experiences so gained by the teachers can enable them to move to the second form of team teaching. The third and fourth types of team teaching should be implemented only when the teachers have attained professional competence to teach different category of students and the administration and organisation of the schools has become flexible enough to encourage experimentation in pedagogy.

**Merits of team teaching:** The following are the merits of team teaching:

- It provides flexibility in grouping of students. For the purpose of instruction, the students may be grouped on the basis of group sizes — small or large; ability, above average, average, below average; achievement; interests and the medium of instruction opted by the students.
- It provides specialisation in teaching. For example, at the secondary or senior secondary level, teachers teaching a single subject, like English, may develop specializations within the subject and may acquire specialisation in teaching of grammar, prose, poetry, drama, composition, etc., leading to improvement in instruction.
- It improves the **supervisory** arrangements in teaching within teaching teams. Greater responsibility is given to the members of the team for transaction of the curriculum and supervision of the work within the team by those who are considered to be experts and can provide leadership.
- It makes possible effective utilization of instructional media, like tapes, slides, video programmes, etc.
- Depending on the objectives, it provides the teachers opportunities to use a variety of instructional procedures and methods.

**Demerits of team teaching:** There is no demerit of team teaching as such. Its only demerit seems to be that it may disturb the rigidity of time-table in which the schools are working at present. Besides, it may affect the present arrangement of holding the individual teacher accountable for the achievement of his students in the public examination.

Success of team teaching actually depends upon those talented, specialist, responsible and committed teachers and persons who are prepared to take up leadership roles.

### Check Your Progress 3

**Notes:** a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

i) State the hinderances in organising team teaching.

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ii) How is team teaching an improvement over lecturing?

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## 7.7 ACTIVITY-BASED INSTRUCTION

The underlying principle of activity-based instruction is learning by doing. You can use a variety of activities for evolving activity-based instructional programmes. The choice of activities would depend upon objectives for which an instructional programme is designed.

### 7.7.1 Nature of Activity-based Instruction

Activity-based instruction is one of the teacher-centred methods of teaching. Through activity-based instruction you can provide valuable experience to your students and make learning a pleasant and lasting experience. For understanding the role/potential of activity-based instruction, let us examine the concept of activity-based teaching. The use of active participation of students in the teaching-learning process is an essential feature of activity-based instruction.

A learning-teaching situation which is characterized by participation on the part of the students may be called activity-based instruction. In activity methods the student is allowed to develop and express his/her own ideas and thoughts. Learning that requires the learner to do something more than just to look at and listen to a teacher or packaged teaching materials is termed activity-based instruction. The student may, for example, be performing an experiment, drawing a figure, making something or carrying out a project.

On analysing the above explanations, you'll notice that one of the main characteristics of activity-based instruction is that it calls for active participation of the students and takes the form of **learning by doing**. Methods such as simulation, role play, gaming, etc., are examples of activity-based instruction. The non-examples of this method are lecture, narration or observed demonstration.

Activity-based instruction may be classified into two categories: Student-centred instruction and teacher-centred instruction.

**Student-centred instruction :** In the student-centred activity approach the students are given freedom to choose the problem and the strategies to solve the problem. The teacher's job is that of a guide of helping them to arrive at the solution. You will study this category in Unit 8 : Learner-controlled Instruction.

**Teacher-centred instruction:** In the teacher-centred activity approach, the teacher acts not only as a guide but also as a planner and manager. He/she selects the problem, determines the activities to be performed by the students, delimits the activities by taking into account the constraints of time, resources, etc., and provides help and guidance to the students in the execution of the activities. Remember, in this type of instruction also the students' actively participate in the teaching-learning process.

### 7.7.2 Types of Teacher-based Instructional Activities

There are several types of teacher-based instructional activities. The important ones among them are as follows:

- i) **Incident method:** In this method the teacher presents a slice of reality i.e. a happening from real life. The students are asked to identify the problem and to recommend an action that needs to be taken in order to deal with it effectively. All the students try to reconstruct the full incident by seeking additional information by questioning the teacher. After gathering all necessary information, they define the problem and think of a solution(s) to solve it. The students use their knowledge in examining different solutions before arriving

at the most suitable one. Sometimes the teacher reveals the actual solution of the problem so that they may compare it with the decision recommended by them i.e. the students.

The essential features of the incident method thus are: brief statement of the problem, extensive questioning by the participants, supply of information by the teacher, group discussion and recommendations regarding the solution of the problem. Please remember that this method does not provide knowledge of a particular solution, but it provides training in the process of arriving at a workable solution.

- ii) **Case study method:** As in the incident method, in the case study method too, a case related to a real or hypothetical situation is presented through verbal, written or electronic devices. The differences between the two methods lies in the degree of comprehensiveness of description. In the incident method, all the details are not provided: only some specific points are stated. On the other hand, in the case method detailed description is provided about the problem and the social or technical system which it relates to. What is common and most important in both the methods is that the teacher does not present his or her solution(s) direct or indirectly. The solution to the problem is discussed and decided by the students.
- iii) **Simulation:** Simulation is an instructional method in which students perform a task in a simulated (artificial) situation as similar to the real situation as possible.

Simulation is a working model of reality. Educational simulations are often simplified which allow students to explore situations, which would be too dangerous, expensive, time consuming or overwhelming to deal with. A nuclear reactor, a breeding experiment, or a general election, etc. etc., are examples of such situations.

Simulation is used in teaching different subjects. For example, in the teaching of science the students may be asked to perform experiments on working models, machines, etc., before doing so on real and expensive equipment. In history, while teaching strategies of attack adopted by Babur and Ibrahim Lodhi, you may use the simulation techniques to organise armies (all the students of the class) in different formations. The teacher of civics may organise a mock parliament in order to provide understanding of the working of Lok Sabha.

- iv) **Games/Simulation games:** You might have seen young children's traditional games and sometimes improvised family games. Games have the elements of job, competitiveness, cooperation and intense motivation. They are played for entertainment. A simulation game combines the features of a game (players, rules and competition/cooperation) with that of a simulation (working model of reality). When the real-life situation to be simulated is competitive, simulation games tend to arise naturally.

There is a wide scope to use simulation games in each subject. For example, in physical sciences, the students may be asked to play the game of 'completion of circuit' with the given equipment. The equipment may consist of card board pieces, large boards with slots, pieces representing bulbs, switches, batteries, etc. The students work in pairs. At the outset the teacher makes the rules of the game and the scoring scheme clear. Marks are also allotted for the time taken in completing the circuit and also for finding faults with the circuits made by other teams.

In teaching of social sciences, say Economics, the students can play a game titled identifying intermediate goods. The students may be divided into four teams each consisting of eight to ten students. One team comes to the blackboard. Each of other three teams names two common final goods like bread, fan, etc. The respondent team has to write five intermediate goods that have gone into its production. Correct answers will be given marks and for wrong ones, marks will be deducted. The questions will not be repeated. There can be four rounds in this game.

- v) **Role play:** Role play refers to a group of techniques in which participants are asked to accept a different role and take or try out first person action in a learning situation. Thus in role play each student is assigned a different role. This enables him/her to look at the situation, not as the person who is actually facing that problem or situation.

In the context of teaching, role playing is used for several purposes. Some of these are as follows :

- to clarify concepts, concretize abstract ideas, etc.
- to practice human relation skills
- to release emotional blocks

- to empathise with others, and
- to diagnose a problem situation

Role playing can be used for teaching various subjects. For example, it can be used effectively for teaching drama in literature. The roles of the king, the queen, the wazir, the jester, the common man, etc. differ and so are their speech patterns. Besides, these role playing can be used in training (i) managers to develop their skills of organizing and directing meetings, (ii) students to face interviews, etc.

- vi) **Prioritisation exercises** : These are relatively simple activities where a group of students is given a list of characteristics of or solutions to a problem and they are asked to rank them according to some definite criteria. After individual ranking has been done, a group discussion follows. This type of activity develops the capability of judgement, communication and interpersonal skills. It also allows for freedom of thought and expression.

### 7.7.3 Merits of Activity-based Instruction

Activity-based instruction has many advantages. Its important advantages are as follows :

- It provides an opportunity to the students to obtain knowledge and understanding by doing or working on the learning tasks/activities.
- It satisfies the natural urge of the students to learn by playing or doing.
- It places the students in practice positions instead of the usual position in which they have just to react. This promotes better understanding among the students.
- Activities introduce the playway method in teaching-learning activities. This raises the motivational level of the students and introduce a competitive spirit among them. This results in better learning by them.
- It provides an opportunity to the students to apply their knowledge and understanding to solve problems faced by them in real life.
- It is most suited for relieving emotional blocks of the students by providing them an opportunity to express their attitudes, inner feelings, beliefs through role playing socio-drama, etc.
- It provides training in inter-personal skills, such as empathising, teaching, managing, etc.
- This method brings out many latent personality traits, qualities and capacities of the students which they might not even be aware of. Thus, it paves the way for enhancing self esteem and confidence among the students.

### 7.7.4 Precautions in Organising Activity-based Instruction

The following precautions need to be taken while resorting to activity-based instruction.

- Before using the activity-based method of instruction, you should ensure that the students have the pre-requisite knowledge and skills required in executing the activity. In case the students lack the requisite knowledge and skills, they should be provided with them.
- The success of activity-based instruction depends a great deal on the proper planning of the activities, involving formulation of the objectives, laying down clear-cut procedure to undertake activities and scoring procedures, organization of the class into groups, assigning roles, directly implementing and evaluating the activities. It is, therefore, essential that you should plan the activities properly before using them for instructional purposes. Resorting to activity-based instruction without proper planning and adequate preparation does more harm than good.
- An important feature of activity-based instruction is learning by doing. Your role mainly is to plan and organize the activity and guide the students. You should not express your opinion in the matter due to sheer force of habit. Such an intervention normally deprives students of the expected initiative. You should be careful not to intervene when the activity is in progress.

The success of the activity-based instruction also depends upon the prior preparation made by the students. You should ensure that the students have made adequate preparation before they carry out the activities.

**Check Your Progress 4**

- Notes : a) Write your answer in the space given below.  
 b) Compare your answer with the one given at the end of the unit.
- Describe, in brief, various types of activity-based instruction.

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**7.8 LET US SUM UP**

In this Unit, you have studied about teacher-controlled instruction wherein the teacher plays an important role in designing and directing instructional activities with a view to accelerate learning amongst the students. Four important instructional procedures viz. lecture method, demonstration, team teaching and activity-based instruction, are discussed in this unit. A relatively longer treatment has been given to the lecture method as we want to improve the monotonous and passive lectures. As has been observed, despite its wide spread use, the lecture method suffers from several defects which make it ineffective particularly at the secondary/senior secondary school level. You can make effective use of this method by acquiring competence in certain skills such as modulation of voice, editing question-answer component, stimulus variation, explaining and illustrating with examples. All these skills can improve your verbal communication. Amongst several other ways to deliver effective lectures the most important ones are clarity of objectives, appropriate organization of content, improvement in physical and psychological environment and improving note-taking skills of the students.

Like lecture, the usual demonstration too suffers from several defects and as such is far from effective. By attending to its objectives, organization, modes of presentation, student's participation on suitable occasions, utilization of spare time for imparting useful information, etc., the demonstration can be made efficient as well as effective. Various features of a good teacher and a demonstration have been presented in the Scale for Assessing Lectures and Demonstration.

Four types of team teaching have also been described in this Unit. Though the team teaching method has several merits, it has not been adopted by the teachers in India. The reasons for its non-adoption have been discussed. Keeping those reasons in view, various measures are suggested to improve and use team teaching in schools.

In the end, we draw your attention on the activity-based instructional procedures. Different types of activity-based instructional procedures have been described. Such activities play an important role in enhancing students' understanding of difficult concepts, principles, theories, etc. Precautions needed while organizing activity-based instruction are also discussed.

**7.9 UNIT-END EXERCISES**

1. While lecturing to a large-sized class, what steps would you take to make it effective?
2. Discuss briefly the skills over which a teacher needs to acquire competence for improving the quality of lectures.
3. What, according to you, constitutes a good demonstration? Illustrate your answer with examples.
4. Discuss the criteria for a scale for assessing effectiveness and efficiency of a demonstration.
5. In what respects is team teaching an improvement over lecturing?
6. Describe the various types of teacher-based instructional activities with examples from subjects that you are teaching.
8. What precautions would you take while organizing activity-based instruction?

## 7.10 ANSWERS TO CHECK YOUR PROGRESS

- 1)
  - i) The three components of TCI are : planning, implementation, and evaluation.
  - ii) The five types of lecture are : classical, problem-centred, sequential, comparative and thesis type lectures.
  - iii) The components of lecturing skills are : voice, modulation, stimulus-variation, explanation and illustration.
- 2)
  - i) Your answers might have included the following points :
    - Improper seating arrangement
    - Lack of rehearsal by the demonstration
    - Lack of clarity in the objective(s) of the demonstration
    - Lack of interest among students
    - Inappropriate pacing of the demonstration
  - ii) There are two main criteria for assessing the demonstration methods: effective presentation and efficient presentation.
- 3)
  - i) The hinderances are as follows:
    - Time-table constraints
    - Lack of accountability of teachers
    - Individual biases of teachers
  - ii) Your answer might have included the following points :
    - Greater pool of ideas and knowledge
    - Variety of view points and experiences
    - Use of expertise of individual teachers
    - Involve more planning and preparation on the part of teachers
- 4) You might have described the following six types of activity-based instruction :
  - Role-play
  - Simulation
  - Incident method
  - Case study method
  - Gaming, and
  - Prioritisation exercises.

## 7.11 SUGGESTED READINGS

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