Input Alternatives – Learner Controlled

Introduction

In the preceding unit, we discussed a few teacher-controlled input alternatives, namely the lecture, demonstration and team-teaching. Now, in this unit, we will discuss some of the learner-controlled input alternatives. In the previous unit, you know that the input alternatives in which the degree of participation of the teacher or teachers is more, as compared to the learners, are called teacher-controlled input alternatives. In the same way, the input alternatives in which the degree of participation of the learners is more, are known as learner-controlled input alternatives. Learner-controlled input alternatives range from the simple assignment to the most sophisticated computer-assisted instruction. In this unit, we have classified the different learner-controlled input alternatives under two broad heads. These are, Self-Learning Methods and Group-Controlled Learning Experiences. Self-learning methods can be more structured or less-structured. In this unit, we will start with more structured methods and then go onto less structured ones.

Learning outcomes

By the end of this unit, you will be able to:

- recognise and use programmed learning materials for your students;
- organise Personalised System of Instruction in your classes;
- use computer instruction materials for teaching-learning purposes;
- organise different group-controlled learning experiences like discussion sessions, seminar, buzz sessions, panel discussions, etc; and
- organise cooperative learning and group investigation activities.

Input alternatives-learner controlled: the concept

All of you know that any instructional system comprises the teacher and the learner besides the curriculum. It is not appropriate to claim that the teacher alone controls the instructional degree of system. Of course, there are certain instructional procedures in which the participation of the teacher is more in comparison to that of the learner. But there also exist other instructional procedures in which the learner plays a pivotal role in the instructional process as compared to the teacher. Hence, the input alternatives which are controlled by the teacher is called teacher-controlled instruction which we have already discussed in the previous unit. In that unit, we discussed a few teacher-controlled input alternatives, namely, lecture, demonstration and team teaching. Similarly, input alternatives which are more controlled by the learner results in learner-controlled instruction.

In learner controlled input alternatives, the learner takes up the responsibility for his/her learning. It, however, does not mean that you, as a teacher, have no role to play in learner-controlled input alternatives. It is a matter of shifting relatively more of the responsibility of learning to the students. When we say that in learner-controlled input alternatives the students assume the responsibility for his or her learning, we want to draw your attention toward the main attribute of this method. That is the emphasis here
is on learning rather than teaching. Your role becomes more of a manager, a facilitator or a guide. Your help is essential throughout the instructional process. Learner-controlled input alternatives include a number of techniques which range from the simple assignment to the most sophisticated computer-assisted instruction. All learner-controlled input alternatives come under the umbrella of self-learning or individualised instruction. In the next section, we discuss the concept and different forms of self-learning.

**Self-learning**

Self-learning or individualised instruction developed when teaching methods meant for all members of a group failed to meet the varying needs of individual students. All underlying assumption in this method of instruction is that human-beings learn many things through their own efforts. Every individual has a natural desire to learn on his/her own. Another assumption is that every individual is unique; he or she learns according to his or her abilities. Hence, any teaching system based on presentation of information to a group cannot take into account the wide variation in the rates at which individual students learn. As the students entering secondary education vary in their abilities, interests and needs, there is a pressing need for a wide range of instructional alternatives which may cater to their individual differences.

Individualized instruction is the only panacea for such needs. The most common description of self-learning methods is that teaching is directed towards individual students rather than the group of students. However, self-learning is not synonymous with independent learning or learning in isolation from other students. Self-learning may encourage independence from the teacher; this, however, is not usually the main aim. During self-learning, the students do not necessarily work in isolation from their peers. The main characteristics of self-learning are:

- emphasis on learning rather than teaching
- recognition of individual differences
- active student participation
- working at one's own pace/self-pacing, and
- provision of feedback and evaluation.

Self-learning as a method of instruction has certain advantages which make it more suited to the students. They are:

- The students learn more effectively when they learn on their own. Self-learning develops critical thinking in handling of study materials on one's own and enhances communication skills and self-reliance.

- Self-learning prepares the student to face the problems in his/her real life

- Learning on one's own is more enjoyable, exciting and rewarding.

- Self-learning promotes self-discipline in the students.

**Forms of self-learning**

Having discussed the concepts of learner-controlled instruction and self-learning, we shall now proceed on to the forms of self-learning. Self-learning can be of various forms. There are two main categories of self-instruction method: more structured or less structured. In this unit, we shall discuss both the type of self-learning methods. Under more structured methods, programmed learning, personalised system of instruction (PSI), computer-assisted instruction (CAI) are discussed. Considering the inputs required by a teacher at the secondary/senior secondary school level, project work is presented under less structured methods. First, we take up more structured methods.
Programmed instruction or programmed learning emerged out of the research conducted by B.F. Skinner on operant conditioning (You will study about operant conditioning in detail in course ES-332). Although Skinner's name is always associated with programmed learning, there were several efforts made earlier by some people in this direction. The Law of Effect propounded by E.L. Thorndike (1874-1949) has direct relevance to programming. According to this law, learning which is associated with satisfaction is likely to be more permanent than learning not accompanied by satisfaction. Satisfaction in the form of reward reinforces the behaviour of the student to take interest in his/her learning. This is an important aspect in programming. In 1926, Sydney L. Pressey devised a teaching machine which required students to press keys to answer multiple-choice questions and the next question was presented only after the correct key had been pressed by the student. The idea behind such a teaching machine was that after being exposed to instruction, the student would go through a test presented by a machine and achieve mastery on all the questions (content) till she/he ceased making mistakes.

The real landmark in the development of programmed learning was the work of B.F. Skinner. After conducting extensive research on rats and pigeons, Skinner developed a theory of learning called operant conditioning. According to this theory, behaviour is learned only when it is immediately reinforced, that is, when it is followed by some pleasurable event such as (nod, praise or attention). Therefore, the task of the programmer is to provide contingencies of reinforcement so that the correct responses to the questions presented are immediately rewarded and the incorrect responses are not. Skinner opposed punishment for wrong responses and recommended that punishment should be kept minimum so that there was no danger of developing a negative attitude towards the learning activity. By applying the principles of operant conditioning in teaching human-beings, Skinner developed an instructional model which is popularly known as programmed instruction. The term 'programmed' is used for arranging learning experiences or events in the most logical and psychological sequence so that the student gets maximum benefit from instruction. Programmed instruction is otherwise known as Programmed learning. Having explained the origin and the concept of programmed instruction, we now present to you the various styles of programmed instruction.

Styles of programmed instruction: There are mainly two styles of programmed instruction-linear and branching. These styles aim at programming of subject matter and are widely used instructional situations all over the world. However, there is yet another style which is used for programming of behaviour. This style is called mathetics. In our discussion, we focus on the first two styles.

Linear style: The linear style of programming developed by B.F. Skinner is otherwise known as Skinnerian style. According to this style, the subject matter is broken into small pieces of information (steps) and is presented in a logical sequence of small steps.

These small steps are called frames. The student is required to go through frames containing a bit or bits of information and respond to the question given at the end of each frame. The feedback in the form of correct answer is provided in the next frame. The frames are so designed and arranged that students' errors are kept to a minimum. In other words, programmed instruction ensures that the students makes/commits minimum errors. An example of linear programming is presented through the following frames.

Example of Linear Programming

Sl. No.35. There are two ways of presenting the frames. In one style, the first frame leads to the second, the second to the third and so. This leads to a sequence that resembles a straight line until the whole information is acquired by the student. See the example in the box wherein six frames are sequenced in a linear fashion.
This type of presentation in which frames appear sequentially one after another in a line is called a .......... frame.

(Go to frame 36)

36. In the linear frame, after the information has been provided, there is always a question which may be like ‘fill in the blanks’ or ‘one word answer’ to be responded by the student. There is always a blank or a question in a .................. frame for the student to respond.

(Go to frame 37)

37. Whether it is a blank or a question, the student has to answer: linear respond to it.

The activity on the part of the student to complete a blank or to answer a question in a linear frame is called a ............se

(Go to frame 38)

38. As mentioned earlier, this feature of the question and response provides scope for active participation on the part of the students. In the last frame, you participated in the instructional process by writing the word ..................

(Go to frame 39)


Branching style: The branching style of programming was developed by Norman, A Crowder. His intention was to use the errors to direct the students to an appropriate explanation or remedial sequence. Therefore he gave students some information followed by a multiple-choice question and provided a different response for each apparently correct answer (distracter) chosen. Students proceed through such a programme, following different routes or branch and care is taken to ensure that they understand each point before they proceed to the next. There are many similarities between linear style and branching style. However, branching style is different from the linear style. There are two main differences between the linear style and the branching style of programmed instruction.

- In branching style the student is presented with multiple-choice questions and (s)he is to select the correct response of the given choices. Then he is routed through branch according to his response.

- This style is based on explanation and reasoning. Therefore, it has been more effective with brighter students.

An example of branching style is present through the following frames:

Example of Branching Style

39. Examine the frame you are reading at present. Is it an example of a linear frame according to the descriptions given earlier for such frames?

Yes, it is - go to frame 41
No, it is not a linear frame - go to frame 40
Correct answer: 40 That is right. It is not a linear frame. You had to choose one of the two alternative answers provided to decide your next frame.
Not a linear frame If you had answered...You would not have come to this frame.

(Go to frame 42)

41. No, the last frame was not linear because in a linear frame, there is a blank or question to which the student has to respond and he is invariably taken to the next frame in the sequence. Hence the last frame was.

(Go to frame 40)

Correct answer: 42 It was a different type of frame. The pattern was different from a linear frame. In a diagram below, Frame 4 gives two alternatives to the student. It has a provision for branching. See the figure here.

→F 4 →F 6 →F 7 →

As there is a provision for branching in frame 4, it is known as a .................................. Frame.

(Go to frame 43)

Correct answer: 43. What about the last frame where we brought in the word 'branching'. Was it a branching frame or a linear frame?
Linear- go to frame 44
Branching - go to frame 45

Correct answer: 44 That is right, it was not a branching frame. In a branching frame the student is provided two or more possible responses and he 'branches' off according to the response he chooses.

F 16 Incorrect answer
F15 → F18 Correct response
F17 Incorrect response

The student goes to two or more different frames according to the choice in the case of a............. frame.

(Go to frame 46)

45. No, it was a linear frame. It has all the characteristics of a linear frame namely, a blank space was provided for the student to respond and all the students were invariably taken to the next frame.

As the above mentioned characteristics were satisfied by the said frame; it was a..................... frame.

(Go to frame 44)

Stages for development of programmed learning material; There are three major stages involved in the development of programmed learning material. These are:

- Planning and preparation of the programme.
- Writing of the programme.
- Evaluation of the programme.

Let us discuss each stage in detail so that you acquire the skill of preparing programmed instruction material for your students.

i) **Planning and preparation of the programme:** This stage involves a few specific activities. These are as follows:

- First you have to select the topic which is to be programmed. This selection depends on the style of programming to be adopted, the scope of the use of the programme, the field of specialisation of the programme and so on.
- Second, you have to find out the characteristics of the target population, namely, their age, gender, interests, intellectual level, experiences, cultural background, etc.
- Third, you have to undertake task analysis of the topic selected for programming.
- Fourth, you have to specify the instructional objectives in observable and measurable terms.
- Fifth, you have to write criterion questions for all the objectives which form part of the pre-and post-tests to be administered when the programme is gone through by the student. It provides a basis for evaluating the effectiveness of the programme
- Last, you have to arrange each step/frame/teaching point in a logical sequence. Each teaching point should contain a new information. Also, you have to look into the type of learning involved within each teaching point. This is important as you have to design the instructional strategy accordingly.

ii) **Writing the programme:** The next important task in programme development is writing the programme. Generally, the teachers prefer either linear or branching style. But, sometimes one does find a combination of both the styles in a programme.

The first decision you have to take is whether you want to follow linear style or branching style or a combination of the both. The second task is to take a decision on frame development. There are mainly four types of frames which find place in a programme. These are:

- Introductory frames - The frames are used to introduce information experience.
- Teaching frames - These frames provide new knowledge to the students.
- Practice frames - These frames provide opportunities to the student to practice what he/she has learned from the teaching frames.
- Testing frames - These frames are developed to assess the knowledge gained by the student. The testing feedback will provide information about the level the student has achieved in terms of pre-fixed objectives.

While developing frames you should pay attention to the following principles:

- Prompts or cues, wherever necessary, should be used to help the learners in selection of right answers. The prompts will help the student to commit minimum errors.
- Superfluous or irrelevant material in the programme must be avoided in order to achieve the objectives of the programme.
- Learning material should be presented in a sequence of small learning steps (frames), each step representing a learning point.
Immediate feedback should be provided after each response to assist the student to know whether or not he/she is progressing properly.

The objectives should be spelled out at the beginning of the programme. The student should be allowed to proceed at his/her own speed.

While sequencing the material, you may be take two approaches into consideration.

- The first is expository or Rule-eg approach in which the rule or principle is presented first followed by an example. The second is discovery or Eg-rule approach in which an example is given first and it is followed by the rule or principle illustrated by the example.

- Prompt: We have already pointed out that while writing the programmed instruction material, prompts or cues should be used to help the students in the selection of the right answers to the questions. It is, therefore, appropriate for you to know the meaning of a prompt. A prompt is stimulus in a frame which increases the probability of the correct response. Let us understand the concept of prompt with the help of the following examples.

The device in the frame which increase the probability of correct response is called pr ............................ Prompt

The capital of France is P .................................

Thus, the role of a prompt is to facilitate the probability of a correct response. The incomplete words will help the student to provide the correct answer.

Editing the programme: Once the first draft of the programme is ready, you should ensure that the draft is thoroughly edited by the experts. The editing exercise helps in improving the quality of the programme. The benefits of editing are as follows:

- Elimination of ambiguities and inadequacies in the programme.
- Improvement in the logical sequence of the frames.
- Improvement in the technical accuracy of the programme.
- Examination of the appropriate use of maps, charts and illustrations, etc., in the programme.

iii) Evaluation of the programme: When the writing of the programme is over, the next, for you, is evaluation of the programme. Evaluation of the programme is carried out to assess the efficiency and effectiveness of the programme. This evaluation exercise is divided at three stages. There are:

a) Individual testing: At this stage, the testing is done on one-to-one basis. This, may that you, as the programme designer, and one representative of the target group whom the programme is meant are involved in the testing activity. At the outset we should tell the student the purpose of the testing and establish good rapport with him/her. Then you should ask the student to read on the frame and respond loudly, when a particular frame is read by the student, you should ask about difficulties faced by him/her and those difficulties should be discussed with the student. Thus, you will be able to locate the inadequacies in the programme, while doing so, you will be able to eliminate those inadequacies.

b) Small group testing: After making necessary modifications/improvements in the draft programme on the basis of individual testing, the programme is ready to give on a small group of students, say 5-6 students. For this activity you have to give necessary instructions and guidance to the students. At the beginning of the programme, students are administered a pre-test and at the completion of the programme, students are administered a post-test. The data collected from pre- and post-tests are analysed to assess the effectiveness of the programme.
Necessary improvements in the programme should be made on the basis of the results of the testing.

c) **Field testing:** This is the last stage of testing the programme. At this time the programme is administered on a large group of the target population. Pre-tests and post-tests are administered prior to starting and after the completion of the programme respectively. The data thus collected from testing are analysed and the programme is modified and made ready for use.

### Advantages of Programmed Instruction

Programmed instruction has many advantages. Some of them are mentioned below:

i) It provides individualised instruction.

ii) It has built in scope for student participation in the form of questions to which the learner is required to respond.

iii) It has facility for feedback which reinforces the correct answer.

iv) It develops concepts in small steps.

v) It can be utilised for any level of learners, viz., primary, secondary and higher.

However, language ability to some extent is expected on the part of the learners. And hence, it is more useful to secondary and higher education levels.

vi) It can be used for different purposes like remedial learning, diagnostic learning, etc. PLM is an appropriate learning technique for imparting basic information.

vii) It may be used as an instructional component with other instructional techniques in a multi-media strategy.

viii) It could also tend to develop higher cognitive abilities if the material is properly programmed.

In the previous discussion, we gave an example of programming verbal behaviour. A question may arise here, "can we not programme psycho-motor behaviour?" Yes, we can. All types of activity-oriented learning can also be programmed. For instance, skills associated with driving a car or working on a machine can be programmed.

### Self-assessment

1. **Which of the following does not serve the purpose of self-learning method?**
   - a) To encourage students to learn on their own.
   - b) To make instructional activity more individualised.
   - c) To discourage teachers from teaching in class.
   - d) To develop in the learner, analytical thinking, self-dependence and self-evaluation

2. **Which of the following is absent in programmed learning material?**
   - a) Individualised instruction
   - b) Self-feedback
   - c) Classroom teaching
   - d) Students' active participation in learning
   - e) Small steps
3. Name three major stages for development of programmed learning material?

4. Below is a list of statements. Write 'T' against the statement which is true and 'F' against the statement which is false.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Each frame should contain a teaching point.</td>
<td>T</td>
</tr>
<tr>
<td>b) In a branching frame, the learner is provided with two or more possible responses.</td>
<td>T</td>
</tr>
<tr>
<td>c) A teaching point may be a fact, or an event, or an idea, or a principle, or even a diagram.</td>
<td>T</td>
</tr>
<tr>
<td>d) Linear frames provide subroutes for learners who make wrong responses.</td>
<td>F</td>
</tr>
<tr>
<td>e) To fill in the blank in a linear frame is called response by a learner.</td>
<td>F</td>
</tr>
<tr>
<td>f) Branching form of programmed learning contains only branching frames.</td>
<td>T</td>
</tr>
<tr>
<td>g) Remedial frames are a must in branching programme.</td>
<td>T</td>
</tr>
<tr>
<td>h) Psycho-motor activities can also be programmed.</td>
<td>T</td>
</tr>
</tbody>
</table>

**Personalised System of Instruction**

Personalised System of Instruction (PSI) is another self-learning technique which emphasises individualisation of instruction in higher education. It has been widely used all over the world and is known as Keller Plan. This technique was first developed in 1963 by Fred, S. Keller, who was teaching psychology in the University of Brazilia. It is called as personalised system of instruction, because the instruction is always fashioned according to the need and ability of the student. According to Green (1964) (referred in Chauhan, 1989) personalised system of instruction gets its name from the fact that each student is served as an individual by another person, face to face and one to one, in spite of the fact that the class may number 100 students. It is suitable for courses for which the student is expected to acquire a well-defined body of knowledge or skill—the majority of college course. The PSI teacher expects almost all of his students to learn his material well and is prepared to award high grades to those who accept the responsibility of meeting this goal within the normal units of manpower, space and equipment.” The students are given programmed texts to read although they are directed to consult other library books. A student’s performance is frequently reinforced. He is allowed to learn at his own pace. He is provided feedback from time to time. A student must demonstrate mastery of a topic through a written examination before going onto the next unit/topic. The role of the teacher in this technique is that of a manager of learning. Let us discuss how this technique is implemented for providing instruction to students.

**Description of the technique**

In PSI, the students are given carefully prepared assignments which generally include programmed learning material, handouts and material which are available in the library. The materials also include questions and exercises. The students are told about the nature of assignment. They are also instructed as to how to read and what to read. The assignment may be of a different kind like laboratory work, library work etc. At a time the student is expected to work on one unit only. The proctors/tutors (not necessarily professional teachers) ensure that the students are provided with proper reading material, remedial material and necessary help whenever students face any difficulties. When a student thinks that he has completed the material, he comes to the proctor. The proctor conducts a short quiz in
order to evaluate the student's mastery over the material. If he is not satisfied with the performance of the student, he asks the student to re-study the course material. If the score is satisfactory, he directs the student to proceed on to the next unit. Students are not given punishment if they commit error or secure low score/grade in assignment. Since the students in this technique learn at their own rate (self-pacing) in order to meet the individual differences in learning, a multi-media approach is followed where the students are provided apart from written material, tapes, film and computer help.

PSI, as an instructional technique, has been proved to be better technique in comparison to conventional teaching. Research evidences show that PSI facilitates better performances, increases retention and promotes transfer of training. While implementing such instructional techniques in teaching-learning situation, the institution should ensure necessary flexibilities in aspects such as examination schedules, annual promotion, etc.

**Computer-assisted instruction**

One of the most important contributions of modern technology to the field of individualised instruction is the introduction of computers in the teaching-learning process. Although, its use has not yet been extended on a mass scale to our educational institutions, the future years may see the teaching learning activities increasingly computerised. As teachers, we must know the role of computers in the teaching-learning process. Computer-assisted instruction (CAI) is, in a sense, an extension of programmed learning material and the personalised system of instruction. You will learn the details about computer-assisted instruction in Block 2, Unit 9.

<table>
<thead>
<tr>
<th>Self-assessment</th>
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<tbody>
<tr>
<td><strong>5. In the Personalised System of Instruction, state what is not usually used as a method of instruction:</strong></td>
</tr>
<tr>
<td>a) Lecture</td>
</tr>
<tr>
<td>b) Programmed text</td>
</tr>
<tr>
<td>c) Audio-visual modules</td>
</tr>
<tr>
<td>d) Tutor aids</td>
</tr>
<tr>
<td>e) None of the above</td>
</tr>
<tr>
<td><strong>6. PSI can be utilised only if</strong></td>
</tr>
<tr>
<td>a) There is an individualised setting for learning</td>
</tr>
<tr>
<td>b) Professional teachers are available to work as proctors</td>
</tr>
<tr>
<td>c) Specific objectives and mastery level tests are prepared</td>
</tr>
<tr>
<td>d) Adults and not children are the learners.</td>
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</tbody>
</table>

**Project Work**

Project work as a self-learning method is less structured as compared to PLM, PSI and CAI. In colleges, you may be giving assignments to your students on the topics you have taught. This may be, asking the students to read a passage, or giving them some home tasks. When these assignments are done in a systematic and organised manner, they take the shape of project works. It is these project works through which the students get experiential learning. This provides the learners opportunity to learn at their own pace and time, while they do certain activities more or less independently of the teacher. The dictionary meaning of the word 'Project' is a scheme or a design.
Several authors have defined the concept of ‘Project’. But, one of the most comprehensive definitions (Good, 1973) (referred in Vedanayagam, 1988), is “A project is a significant, practical unit of activity having educational value and aimed at one or more definite goals of understanding; involves investigation and solution of problems and frequently the use and manipulation of physical materials, planned and carried to completion by pupils and teachers in a natural real-life manner.”

Let us now try to analyse the above definition and specifically formulate the different characteristics of a project work. It provides real-life experiences to the students. It helps them to plan, to observe and to conceptualise. It entails the involvement of both the teacher and the students. It tends to develop self-learning habits in the learners. The learners are able to tackle certain kinds of problems systematically.

**Aims of project work**

The aims of project work can broadly be classified into the following categories:

1) Knowledge
2) Skills
3) Personality attributes

1) Knowledge

Working on a project, enables the learner to develop knowledge of his topic and the various techniques used in his area of study. He knows about the methodology used in the discipline. He understands the difficulties in solving problems. These may be difficulties related to time, material, labour, cost, etc.

2) Skills

The project work develops the following skills in the learners. They are:

**Skills for independent work**

Students develop independent thinking and working habits while working on a project. This method inculcates initiative and resourcefulness. A student learns to plan his work, analyse factors involved in solving a problem, hunt for sources, collect data, select relevant materials, fabricate experiments, manipulate instruments, make keen observations, analyse results, synthesise findings, make generalisation, present his findings and communicate them properly.

**Skills for group work**

Very often, project work is done in a group. While working in a group, the learners develop the ability to co-operate with others, coordinate and manage the people. Group projects thus provide an opportunity to develop fellow-feeling and democratic spirit.

**Skills for communication**

Project work develops in the learner’s communication skills through a variety of activities. It develops oral skills by argument and discussion with colleagues and supervisor.

3) Other personality attributes

Project work, apart from its primary goal, i.e., achieving an end product in the form of a report, also inculcates various personality attributes in the learners. These personality attributes may be higher mental abilities like critical thinking, creative thinking, evaluative ability, analytical thinking etc. and certain affective attributes like interest in the area of study, social sensitivity, etc. The project work, therefore, helps in cognitive and affective development of the learners.
Types of project work

Projects may broadly be of the following types:

i) Laboratory work

ii) Field work

iii) Library work

Library work

Very often, the students are asked to undertake projects which relate to library work. Library work is an individual activity which the students are expected to do in the library. This method has the potential to promote individualised learning experiences. Library work is also known as Library Assignment. In colleges, teachers follow different ways of inducting the students to do library work. Two ways of organising this activity are discussed here:

(i) After the introduction of the topic by a teacher: The teacher after providing the necessary information to the students in the class tells them about relevant books which concern the particular topic he has taught along with the relevant page numbers. They are also asked to go through the catalogues, references, journals, etc., to enrich their knowledge about the topic taught. They are also expected to develop a report on the library work they have done.

(ii) Before a teacher’s lecture/discussion on the topic: A different way of conducting the library work is to first ask the students to read different books and journals on the topic to be taught. They are asked to come with small reports on the basis of which the teacher holds discussion with them.

Whichever way a teacher may organise the library work, he should specifically tell them of author’s name, publisher’s name, the year of publication, etc. Moreover, the students should be told how to use the catalogue and other library equipment.

Library work develops the self-study habit among the students. It familiarises them with the existence of the library as a resource and gives them practice in learning to use books, journals, encyclopedia, dictionaries, manuscripts, research abstracts, etc.

Laboratory Work

The objective of laboratory work is to develop certain skills through activities conducted in controlled conditions. Particularly, in science and science-related subjects, the students are required to undertake open-ended experiments or mini-research projects. In undergraduate classes, the students are expected to carry out very small experiments like

Figure 1: The nice thing about this research lab is that the scientists are always out attending seminars, leaving you completely undisturbed!

Courtesy: R.K. Laxman
dissecting a frog and displaying its internal parts, finding out the properties of various elements and radicals, taking a thin section of a plant and mounting it on a slide, finding the refractive index of a material using a spectrometer, etc.

Sometimes, the students of a college undertake projects of community interests. Such type of projects include the analysis of the impact of pollution on the environment, analysis of the pesticide content in fruit and vegetables, etc. Thus laboratory work involves the application of the theoretical concepts or principles already learnt, for performing certain activities which may be manipulation, organisation, experimentation, interpretation, etc. Laboratory work develops skills of planning, observation and analysis of the results. The students get real-life experiences (with of course certain controls) and get the opportunity to discover many things themselves whether or not these things have already been discovered by others. Since, the students working on projects have limited subject matter background, their work may not always contribute to discovering new and original ideas. However, if something new and original comes out of the laboratory investigation, it should be considered as a piece of research.

Field Work

Unlike laboratory work, field work is conducted in real-life conditions, but not under controlled conditions. The students are expected to go to the real life situations where they observe a phenomenon, collect the relevant data, process and analyse the data and arrive at conclusion. Hence, it is more in the nature of survey or data collection in the field. Field work is appropriate both in physical and social science subjects.

Very often, teachers in the college provide the critical description about the various phenomena which can be learnt better by students if they get first-hand experience of these. In such cases, field work is the most appropriate technique that can be utilised. For example, the students of M.A. (Anthropology) class may be given a topic to study the living conditions of a particular tribe. Here, the students are expected to work in that tribal area, observe the living conditions of the tribals, interview and observe them regarding their customs, traditions, reliefs, etc. They also collect and make use of the available literatures. Once the data are collected, these are analysed and conclusions arrived at. Finally, the project report is prepared by the students.

How to Organise Project Work?

Project work is an effective instructional method which requires participation of both the teacher and the students. With your initiative and direction the students can be fruitfully engaged in the project work. Let us discuss what is expected of you as a teacher while organising project work.

Preparation for project work: When preparing for the project work, you should help the student to perform the following tasks:

- Selection of appropriate subjects/skills/procedure/problems/topics for the projects.
- Offering students a choice of subject/skill/procedure/problem/topic (if feasible).
- Formulating or rather helping to formulate clear objectives of the project.
- Listing the resources and guiding how to locate and use those resources.
- Sequencing the work efficiently.
- Time-tabling the project realistically.
- Organising an adequate record system.
- Organising and explaining the assessment schedule.
- Formulation of evaluation criteria.
- Outlining evaluation procedures.
With the preparation of the above tasks, you should be able to set the stage for implementation of the project. At the implementation stage also, you are expected to perform a number of tasks.

Tasks at the implementation stage: The tasks performed by you during the implementation of the project are as follows:

- Organising a preliminary briefing session for the students. Forming groups for group projects.
- Helping every student select a topic/subject for the project.
- Assisting every student to plan the project by checking the plan outline, eliminating weaknesses, correcting work sequences, suggesting optimal use of resources, checking feasibility of the timetable, suggesting appropriate sources of information, etc.

Table 1: Evaluation Scheme for Project Work

<table>
<thead>
<tr>
<th>Stage of Project</th>
<th>Rating</th>
<th>Marks</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E VG G S FS U</td>
<td>Total</td>
<td>Awarded</td>
</tr>
<tr>
<td>Planning</td>
<td>5 4 3 2 1 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Selection of problem</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2. Formulation of objectives</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3. Task analysis</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. Strategy/Plan</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5. Sequence</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6. Methods</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Information</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>8. Project methodology</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>9. Use of equipment/material</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10. Organisation</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>11. Application</td>
<td></td>
<td>5</td>
<td></td>
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<tr>
<td>12. Analysis</td>
<td></td>
<td>5</td>
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<tr>
<td>13. Synthesis</td>
<td></td>
<td>5</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Reporting</td>
<td>14. Interpretation</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>----------------------------</td>
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<td>------------</td>
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<tr>
<td>15. Evaluation</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Conclusion</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Project report or product</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Presentation</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E = Excellent 5 Marks  
VG = Very Good 4 Marks  
G = Good 3 Marks  
S = Satisfactory 2 Marks  
FS = Fairly satisfactory 1 Mark  
U = Unsatisfactory 0 Mark

- Checking every student's progress regularly.  
- Suggesting modifications to plans when necessary.  
- Encouraging and assisting individual student frequently.  
- Checking student's evaluation procedures.  
- Assessing the project in accordance with the planned scheme.  
- Evaluating the whole project with other students including the project report, project product or procedure.  
- Organising an effective group debriefing session.  
- Evaluating the efficiency and effectiveness of the project as a learning activity.

**Evaluation of project work**

Evaluation of project work involves both the processes and the product of the project. The product of the project may be some concrete material or the project report. A scheme for evaluation of the project work is presented in Table 1.

**Role of a student in Project Work**

The student has to play an important role in project work. Though you are there to help him throughout, the main responsibility of carrying out the project work lies with the student. There are three major stages the student has to work through while carrying the project are:

i) **Planning stage**: At the planning stage, the student has to consider the following tasks:

- The student should have a clear idea of the objectives and the criteria of the project.
If there is any ambiguity, he should seek your help.

He should understand the scope and limitations of the project.

He should carry out a task analysis of the project in terms of skill(s), problem(s) or procedure(s).

He should design a suitable plan, strategy or method for dealing with the project.

He should arrange the tasks in a sequence and fix a target date to complete the project.

He should discuss with you various aspects of planning.

ii) Implementation stage: At the implementation stage, the student should carry out the following tasks:

- Collect all necessary information.
- Decide about suitable methods of enquiry.
- Use resources such as equipment, materials, available expertise, etc., effectively.
- Cooperate with other students in case of group project
- Carry out the processes involved in the project, namely, analysis, synthesis, application, decision making, problem solving, etc.
- Stick to time schedule prescribed for the project.
- Secure help and guidance from the teacher throughout the implementation stage.

iii) Reporting/presentation stage: The student is expected to carry out the following tasks at the reporting stage:

- Interpret information and use materials properly. Draw appropriate conclusions.
- Compile an effective project report.
- Present the report, product, procedure, decision or solution effectively.

Self-assessment

8. Which of the following is not an aim of project work?
   a) It helps in experiential learning.
   b) It develops in the learners, the spirit of research.
   c) It fosters creativity in the teachers.
   d) It promotes self-learning in the learners.

9. Which of the following is true regarding both laboratory work and field work?
   a) Both are done in controlled environments.
   b) Both are done in uncontrolled environments.
   c) Both are supervised by the teacher.
10. Below is a list of statements. State which of them are true statements and which, false:

a) Library work increases the burden of the teacher.

b) With the introduction of interdisciplinary research, the discipline-based researches would be stopped.

c) Laboratory work and field work develop scientific attitude in the learners.

d) Library work fosters study habit among the students.

e) Project work cannot be conducted in languages and literature subjects.

**Group controlled learning experiences**

So far, we have discussed learner-controlled input alternatives in the form of self-learning or individualised learning. Now, we shall shift our focus from self-learning to group-controlled techniques under group-controlled learning experiences.

Instructional techniques involving group-controlled learning experiences provide room for the learners’ self-development and active participation in the teaching-learning process. Group-controlled learning experiences are increasingly used in institutions of higher education to facilitate the development of higher cognitive abilities and affective attributes. Before proceeding to learn about group-controlled learning experiences, we should know the meaning of a group. “A group” in a college classroom comprises members having common academic goals, similar academic background and more or less similar age or within a very narrow age range. Other than these, there could be a considerable variation in the socio-cultural background, psychological characteristics like aptitudes, attitudes and interest, and norms and values developed through years. You will know more about group and group dynamics in Course 3 of PGDHE.

**Individualised learning Vs. group controlled learning experiences**

Now that we know the meaning of a group and its characteristics, we should understand the necessity of group-controlled learning experiences. In this context, we can discuss individualised learning Vs. group-controlled learning experiences. As teachers you know that the sole aim of all instructional activities is to provide learning and to bring about the development of an individual in terms of the preservation of his identity and the attainment of meaningful ways of interaction with his environment. In group-controlled learning experiences, the learner is not only influenced by the stimuli, a part of the environment around him, but he can also in turn, influence them as he too has a role in generating the stimuli. Individualised learning is better suited to acquiring knowledge, development of understanding and development of skills. Whereas group-controlled learning experiences, apart from the development of various higher cognitive abilities, do help in the development of affective attributes.

Having known in brief about the group-controlled learning experiences it is worthwhile to be acquainted with some of the techniques of providing these group-controlled learning experiences.

**Some techniques of providing group-controlled learning experiences**

There are a variety of techniques of providing group-controlled learning experiences. Illustrations are given below so that you can adopt it to suit your context. Each of these techniques has its own conditions, organisation and instructional potential.
I) **Discussion Session**

i) **Conditions:** The simplest form of group-based learning technique is the discussion session, which can be used in a variety of situations in the higher education context, for example situations like giving feedback on the responses of a class test, clarifying the doubts of students at the end of a lecture, resolving the debatable issues raised during lecture, generating alternative solutions to a classroom problem, and breaking the monotony of “teacher talk”.

ii) **Organisation:** For effective utilisation of this method, the teacher should give sufficient background information to students or ensure that the students already possess the same. This is a primary requisite for a discussion to take off. A discussion cannot operate in a vacuum of information. The ability of the teacher to initiate a discussion often decides the ability to postpone. He may give his judgement later, on the issue being discussed and the responses of individual students. The teacher’s judgement, through even a non verbal cue can affect the nature and pattern of responses.

iii) **Instructional potentials:** It can develop higher cognitive abilities effectively apart from reinforcing knowledge. The uniqueness of this alternative lies in its simplicity, but its effectiveness is related to abilities of the moderator or leader.

II) **Buzz Session**

i) **Conditions:** Based on the previous knowledge of the students, you may pose a set of complicated problems or complex tasks to the students which need the application of previous knowledge.

![Buzz Session](image)

**Figure 2 : Buzz Session**

ii) **Organisation:** In buzz sessions, you allot a fixed amount of time for the students to discuss a problem or a task in small group (in pairs, threes, etc.). Clear instructions may be given so that discussions are productive. The efficiency of such a session would be enhanced by the teacher moving around and getting a feel of the discussions without interrupting. Giving too much of time or too less of time would be counter productive. Once the small groups finalise the solutions to the problem, the representative of the group reports back to the teacher. The teacher has to compile all the reports and provide his judgement to the students. You can organise this even in a regular class of large strength or you can form groups among the students and ask the groups to take their leisure time to discuss their problem and report back to you. This is called Buzz Session, because groups buzz like bees while discussing the problem.
iii) Instructional potential: The uniqueness of this input alternative is that it is useful in deriving creative and innovative solutions to tasks and problems without much sophistication in the procedure adopted or the hardware used.

III) Tutorial Session

i) Conditions: In situations where students need guidance from the teacher regarding a learning task, such as, project work, utilisation of self-learning material, etc., tutorial sessions may be useful.

ii) Organisation: These sessions may be organised even informally as and when the necessity arises, in addition to the ones formally organised through a schedule. In tutorials, the teacher acts as a guidance worker instead of a lecturer. He solves the problems of either the individual student or the group. The students get an opportunity to discuss their learning problems and to clarify their doubts. There are plenty of other situations where tutorial sessions find use e.g., in giving guidance to a few under achievers or slow learners or problem students, to give special assistance to a small group who are enthusiastic, carrying out co-curricular activities like fabricating model, visiting a place of special interest, staging a drama for the annual festival, planning an expedition, etc.

iii) Instructional potential: The uniqueness of this alternative lies in its usability for a variety of purposes. This input is most suitable in helping the learners solve educational and personal problems. Unlike other alternatives discussed in this unit, this is a highly flexible alternative in terms of its organisation and implementation. The effectiveness of using this alternative depends, to a great extent, on the interpersonal relationships of the group members with you, and your ability to cope with the dynamism of the relationships.

IV) Debate Discussion

i) Conditions: This alternative is especially suitable to controversial themes or issues and for developing certain skills like logical arguments, weighing evidence, etc., in students.

ii) Organisation: The participating students could be divided into two groups, one for a proposition, and the other, against it. The remaining students can form the audience and towards the end the audience can involve themselves in a short discussion.

iii) Instructional potential: The uniqueness of this alternative lies in its ability to involve the students to a very high degree, in terms of gathering information, processing it and presenting to the audience, proposing, arguing and counter arguing, especially by noting the points raised by the previous speakers.

V) Seminar

i) Condition: When a topic requires in-depth study by means of library work or experiments or such other data collection studies, a seminar is organised by assigning students the different facts of the topic and asking them to present their paper before an interested group followed by a discussion.

ii) Organisation: Presenting a theme paper at the request of a chairperson and then leading a discussion moderated by the chairperson constitute a seminar. More of its organisation, you will learn, in Unit 8 of Block 2.

iii) Instructional potential: The uniqueness of this alternative lies in its use in the higher education courses like professional courses and post graduate courses, as it demands a high degree of information processing abilities on the part of the presenter and the other participants leading to development of higher cognitive abilities. The above statements should not be taken to mean that this alternative is
not of use in an undergraduate class. Students could be divided into groups and each group could be asked to prepare a paper on a given theme. This could be presented by the group leader to the whole class so that all benefit. Recent developments in the subject areas under study could be presented as seminars by selected students of a graduate class following a discussion.

VI) Symposium

i) **Condition:** This alternative is suitable for teaching topics or themes having various dimensions.

ii) **Organisation:** Selected students and different staff members can form teams for the presentations. Each team would present the different dimensions of the same theme, one by one, in a preplanned sequence. It would then be thrown open to the 'floor' or 'house' for discussion. A chairman initiates and regulates the proceedings.

iii) **Instructional potential:** As mentioned earlier, the uniqueness of this alternative lies in its suitability for teaching multidimensional themes or topics and thus it provides a wider prospective to the learners.

VII) Panel Discussion

i) **Conditions:** When the themes or topics are of a very complex or controversial nature, panel discussion happens to be a good choice as it brings out the difficult aspects in a constructive manner.

ii) **Organisation:** The members of a panel could be selected students and teachers. Questions regarding a topic or a series of topics could be collected in advance from among the students and they could be sorted out, depending on the subtopics or dimensions of the main theme. The questions are given to the panel members in advance, depending on their expertise on the sub-themes or subtopics so that they come prepared with answers/evidences, etc. A moderator initiates the discussion by explaining the purpose and scope and raises the questions in a predetermined order to the various members of the panel. Then the members of the panel present their views one after the other. Later on each member may also react to the others' views. The different viewpoints and interactions are synthesized by the moderator. If time permits, further questions are invited, on the spot, by the moderator and these are addressed to the panel members. The moderator summarises the key points and highlights the learning points that have emerged out of the deliberations.

iii) **Instructional potential:** The uniqueness of this alternative lies in its ability to resolve issues and seek clarifications of controversial and multidimensional topics and themes. This process tends to develop abilities such as critical thinking not only in the panel members but also in the larger group.

VIII) Brainstorming

i) **Conditions:** This alternative is useful in developing the creative abilities of the students. Problems which demand creative or innovative solutions can be presented by the teacher to the students through brainstorming.

ii) **Organisation:** In a classroom, the teacher can select a problem oriented topic and ask the students to express themselves freely on various aspects of the topic. The teacher assures the students that their expressions will not be criticised, or commented upon in a negative way. The views/opinions of the participants would not be weighed as relevant or irrelevant but the students are encouraged to come out with their own ideas and opinions, feeling, expression and comments. The teacher takes note of all these expressions. After the session, or preferably on another day, the teacher may evaluate, elaborate and integrate the ideas expressed, in order to encourage further thinking amongst the students along newer dimensions.
Instructional potential: The uniqueness, as hinted earlier, lies in its potential to foster creative thinking. This technique is particularly useful for problem oriented themes.

IX) Simulation through Role Playing

i) Condition: This alternative is of use in developing many skills in students like decision-making, communication, building inter-personal relationships and other composite skills.

ii) Organisation: Simulation is an alternative which has many facets, like instruction through mechanical simulators, computer controlled simulators, educational games and role playing. Here we would discuss about simulation through role playing as an input alternative. Life-like situations can be simulated inside a classroom, by assigning different roles to different students and asking them to play these roles after giving them the background of an episode. Unlike a stage drama, there are no fixed dialogues and so creative expressions of the students will be encouraged within the parameters of the role that they play.

iii) Instructional potential: The uniqueness of this technique lies in its ability to develop skills using life-like composite problems without the danger of damages caused by learning errors.

In spite of the known potentialities of group-controlled learning experiences, the reality is that the utilisation of such experiences for instruction has not been to the level expected in higher education. Reasons for this could be several. Main among them are the vast amount of subject matter that is to be dealt with, the belief on the part of teachers that every bit of content should be delivered through him and that he is responsible for it, availability of a very handy instructional technique like the lecture, the increasing number of learners in a classroom and the wide variations that exist among them. All these problems can be tackled suitably by making use of the lecture, library work and the group interactional sessions in the available number of hours of each unit. After one or two precise lectures to the entire group of students, they may be divided for the subsequent hours, into more than one group and directed to library work and group interaction alternatively. To sum up, group-controlled learning experiences have a lot of potentialities for a teacher of higher education.

Self-assessment

11. Which of the following is true in case of group-controlled learning experiences?
   a) It helps the learners develop communication skills.
   b) Cognitive and affective development in the learners take place as a result of this.
   c) It helps in the generation of new knowledge.
   d) It fosters human relations among the learners.
   e) None of the above.
   f) All of the above.

12. List 'A' contains some techniques of group-controlled learning experiences and List 'B' contains the nature of each of these techniques. Match List 'A' selecting suitable options from list 'B':

<table>
<thead>
<tr>
<th>'A'</th>
<th>'B'</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Debate discussion</td>
<td>A. Simplest form of interactions</td>
</tr>
<tr>
<td>2. Buzz session</td>
<td>B. Life-like situations are enacted</td>
</tr>
</tbody>
</table>
3. Discussion session  C. Two or more teachers teaching as a team to a large group

4. Tutorial session  D. Resolving issues of controversial and multidimensional nature

5. Brainstorming  E. Discussion in small group, preferably in pairs or a group of threes

6. Role playing  F. Teacher as a guidance worker

7. Symposium  G. Issues are individually reflected upon before reporting to the group

8. Seminar  H. More than one member present their views on the same topic which is followed by discussion

9. Panel discussion  I. When one group gives its views on a chosen topic the other group puts forward its views against it.

J. Mostly used in professional and postgraduate courses

K. The session in which the teacher welcomes everybody's experiences, to solve the problem without commenting on anyone's point of view.

**Co-operative learning method**

Dedicated teachers are always looking for better ideas for meeting the many challenges they face in colleges, especially as diversity increases in the student population. Cooperative learning methods provide teachers with effective ways to respond to diverse students by promoting academic achievement and cross-cultural understanding.

**How to make co-operative Learning Successful**

Cooperative learning takes many forms and definitions, but many cooperative approaches involve small, heterogeneous teams, usually of four or five members, working together towards a group task in which each member is **individually accountable** for part of an outcome that cannot be completed unless the members work together, in other words, the group members are **positive interdependent**. A vivid example of interdependence can be found in the relationship between language-minority and language-majority students in two-way immersion programs. For example, the Hindi speaking students work together with a student from other language background to become bilingual. A dull student learn with the help of the other classmates to enhance his/her learning.

Positive interdependence is critical to the success of the cooperative group, because the dynamic of interconnectedness helps students learn to give and take to realise that in the group, as well as in much of life, each of us can do something, but none of us can do everything. When cooperation is successful, synergy is released, and the whole becomes greater than the sum of its parts. For cooperative groups to be effective, members should engage in team building activities and other tasks that deal explicitly with the development of social skills needed for effective teamwork. Members should also engage in group processing activities in which they discuss the interpersonal skills that influence their effectiveness in working together.

The essence of the cooperative group is the development and maintenance of positive interdependence among team members. A sense of interconnectedness can help students transcend the gender, racial, cultural, linguistic, and other differences they may sense among themselves. Unfortunately, these differences often are at the root of prejudice and other interpersonal stress that students experience in educational institutions.
When students work in cooperative teams in which “all work for one” and “one works for all,” team members receive the emotional and academic support that helps them persevere against the many obstacles they face in colleges. As cooperative norms are established, students are positively linked to others in the class who will help them and depend on them for completing shared tasks. By becoming knowers as well as learners in a supportive atmosphere, students can establish more equal status relationships with their peers.

When the environment becomes more equitable, students are better able to participate based on their actual, rather than perceived knowledge and abilities. Team work, fostered by positive interdependence among the members, helps students learn valuable interpersonal skills that will benefit them socially and vocationally.

Students do not know instinctively how to interact effectively with others. Social skills, like other skills, should be taught and reinforced. Team building activities will help students get to know and trust one another. Other important social skills include accepting and supporting one another and resolving conflicts constructively. Teachers need to model positive interpersonal skills, have students practice the skills, and encourage the students to process how effectively they are performing the skills. Focusing on social skill development will increase student achievement and enhance the students’ employability, interpersonal relationships, and general psychological health.

Organising cooperative learning: For organising cooperative learning, you should ensure that students work in groups and each group member works in a cooperative manner to achieve the common goal. The specific activities you have to organise are as follows:

a) Formation of groups: You should divide the class into small groups. While forming groups, you should keep in mind the heterogeneity among students in respect of sex, intelligence, religion, etc. Each group should consist of a cross-section of the class: boys, girls; above average, average and below average students in terms of intelligence. You should try to form groups by including students from different communities.

b) Preparation of cooperative learning sheets: You should prepare these sheets for all the topics to be taught through cooperative learning. These learning sheets consist of objectives, activities to be done by the group members in accordance with the content of the topic and evaluation items based on the objectives.

c) Orientation to the students: As students are used to working individually, they have to be oriented properly to work together. You should inform them about how cooperative learning will be organised. Every learning point should be discussed collectively. A student who does not understand could be explained well by another student. They should work as a team to achieve the set goals. They should be informed that they will not be evaluated individually; rather the entire group performance will be assessed. The group as a whole should ensure that every individual members of the group learns every concept. Average performance of the group will be the index of group learning progress.

d) Conducting the cooperative learning session: You should allot time for cooperative learning sessions and distribute cooperative learning sheets to the groups. All groups should carry out learning activities according to guidelines given in the sheets. These learning sheets should provide flexibility to the students. The students may modify the activities according to the requirement of the group members. They may discuss the problem, ask questions, explain concepts and solve problems according to their convenience. Every member may be evaluated by the group. If a member commits mistakes, he may be helped by others. At this stage you should observe how cooperatively the groups are working. You should give feedback to
each group about whether they are proceeding in the right direction and gaining from the session. Finally, the group should report about what they have done and how they have performed. The performance reported should be the average performance of the group.

i) Advantages of cooperative learning: In cooperative learning an informal situation is created based on mutual dependence, feeling of being-accepted, liked and supported by fellow students. They have the freedom to exploit their ideas, discuss with their friends and sharpen their thinking and actions, get help and provide support to others. Thus cooperative learning is quite advantageous to students. The main advantages of cooperative learning are as follows:

Students are often able to translate the teacher's language into their own language and enrich their understanding.

Students learn by actually participating in the teaching-learning process. The students have to organise their thoughts to explain ideas to their mates. They engage themselves in cognitive elaboration that greatly enhances their understanding.

Students can provide individual attention to and get assistance from one another. As they can freely seek assistance from fellow students in cooperative learning, their achievement will be much higher.

<table>
<thead>
<tr>
<th>Self-assessment</th>
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<tbody>
<tr>
<td>13. State, in 5-6 lines, the meaning of cooperative learning.</td>
</tr>
<tr>
<td>14. Main activities to be carried out by the teacher to organise cooperative learning are:</td>
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<tr>
<td>15. What criteria will you keep in mind while forming the groups?</td>
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<tr>
<td>16. What does a cooperative learning sheet consist of?</td>
</tr>
<tr>
<td>17. What role a teacher will perform in conducting the cooperative learning session?</td>
</tr>
<tr>
<td>18. State the main advantages of cooperative learning.</td>
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</table>

**Group investigation**

There are certain topics which raise doubts and questions in the minds of the students and for those they do not find answers in the textbooks. To answer such questions requires investigation into the phenomenon. Problems/questions whose answers are not readily available require investigation. Some of the problems are such that no individual student can investigate these by himself. It is, therefore, desirable to carry out group investigation in such a situation. The process in which a group of students selects problems/questions and tries to find out their solutions collectively in a scientific manner is called group investigation.

**Organising a group investigation:** In order to take up group investigation as an instructional activity at the higher education stage and to make it successful your guidance to students is very much essential. Do you know how a group investigation should be carried out? It is necessary for you, as a teacher, to know what are the different phases through which group investigation proceeds. A class engaged in a group investigation will go through the following phases:

**Selection of problem:** You may indicate some exemplar problems and guide the groups to select a suitable problem for investigation.
**Cooperative planning:** The members of the group will plan their work regarding collection of evidence, sources of evidence, and allocation of work among members. They should also estimate the time to be devoted to investigation work. Besides collecting data from various sources, the group should also plan about how data will be analysed and who will do the analysis. They should also decide the way the report on the investigation will be prepared. For each activity, time must be estimated.

**Implementation:** Work should be started according to the plan. Every member should try his/her best to complete the activities within the stipulated time. Evidence from all the sources and areas should be collected.

**Analysis and synthesis:** The collected evidence should be analysed and synthesised logically in order to arrive at valid results.

**Preparation of report and presentation:** A brief report of the work done should be prepared by each group. The report should include information about how the work was done and what findings were arrived at. The report should not be of more than a few pages. It should not be a very technical report but just a write-up which should be presented by the coordinator of each group.

**Evaluation:** You should evaluate the work of each team on the basis of your observations of the group's way of solving the problem. You should judge whether evidence collected are adequate and valid, and solutions arrived at are logical and based on facts. You should provide feedback to the group.

**Summary**

In this Unit, we have tried to give you an understanding of the role played by learner controlled input alternatives in the teaching-learning process. We started our discussion with self-learning methods, particularly programmed learning. While pointing out the genesis and meaning of PLM, we acquainted you on how programmed learning material is prepared, giving some text on the Programmed Learning through the Programmed Learning style itself, we also discussed personalised system of instruction (PSI), popularly known as the Keller Plan, which constitutes another important self-learning method. Then, we shifted our focus from self-learning method to project work which also comes under self-learning method but is less structured when compared to programmed learning and PSI. Under project method, we discussed mainly three important methods. These are laboratory work, field work and library work. We highlighted on how these methods facilitate experiential learning and how they are carried out in colleges and universities. We also mentioned how to improve upon the present practices of project method. Our discussion also centered around group-controlled learning experiences. In this context, we mentioned nine group interaction techniques and their conditions, organisations and instructional potentials. Lastly, we discussed cooperative learning and group investigation.

**Unit-end activities**

In India some organisations have developed instructional materials of the types described in this unit, e.g. National Institute of Bank Management and Life Insurance Corporation have prepared a series of Programmed Learning texts (for clerical employees of banks and for career agents respectively). Similar the Technical Teachers' Training Institutes in Bhopal, Chandigarh, etc. have employed PSI in their training programmes. Find out from your friends and through library which organisations in your state have prepared programmed instructional materials.

**Points for discussion**

1. In recent years there is more and more stress on self-learning methods particularly in industry. Why?
2. Since childhood we learn many things from our peer groups, sometimes in a structured/organised and formal manner, and sometimes in a non-formal or informal manner. Reflect on your experiences and relate what you and your friends have gained from interacting with groups.

Suggested readings


Answers to self-assessment

1. C

2. C

3. i) Planning and preparation of the programme
   ii) Writing the programme
   iii) Evaluating the programme

4. (a) F  (b) T  (c) T  (d) F  (e) T  (f) F  (g) T  (h) T

5. A

6. B

7. No. Though self-learning method, the major role is played by the learners, the teacher has to do a lot, like the preparation of self-learning material, monitoring students learning and evaluation of students' performances at the final stage of learning activity.

8. C

9. C

10. (a) False (b) False (c) True (d) True (e) False

11. F


13. The method of instruction where students are divided into groups and the students of each group learn with the support of each other. They try to achieve the goal as a group. Due to this there is greater participation and involvement of students. This method of instruction is called co-operative learning.
14. a) Formation of groups  
   b) Preparation of learning sheets  
   c) Orientation to the students  
   d) Conducting the session  

15. While forming groups, you should keep in mind the heterogeneity among students in respect of sex, intelligence, religion, etc.  

16. A cooperative learning sheet consists of objectives, activities to be done by the group members and evaluation items.  

17. While conducting a cooperative learning session, the teacher allots the time for the session, orient the students what they are expected to do, distributes the cooperative learning sheets. The teacher observes the group work and provides feedback to each group. Finally, the teacher evaluates the performance of each group.  

18. a) Students express themselves in their own language.  
   b) They learn by actually participating in the teaching-learning process.  
   c) Students can provide individual attention to and get assistance from each other.