

MILITARY PSYCHOLOGY  
SELECTION AND RECRUITMENT

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The success of any organisation including military organisation depends upon how effectively human resources are managed and utilised. Therefore building and maintaining an effective human organisation is one of the foremost objective of military management. To realise this objective almost all military establishments try repeatedly to refine their recruitment & selection procedures so that right person can be placed on a right job.

Recruitment is the discovery of potential applicants for actual or anticipated organizational vacancies. The objective of recruitment process is to provide a sufficiently large group of qualified candidates so that suitable employees can be selected out of them. The need for recruitment arises due to vacancies created by transfer, promotion, retirement, disability or death, and due to expansion, diversification & growth of the military organisation. Recruitment begins with a clear specification of human resources required with a clear indication when or by when they are needed. The recruiting methods fall into 3 categories.

- (1) Direct
  - (2) Indirect
  - (3) Third party
- Indian defense organisations essentially use indirect method of advertising for generating



applications by informing people about vacancies. Military organizations usually advertise in magazines, news papers + also on T.V., radio and Billboards.

They also use third party method which involves the use of state or public employment agencies.

Selection is the process by which an organization chooses from the screened applicants, the person or persons who best meet selection criteria for the position available. The basic objective of selection is to acquire such personnel who are most likely to meet military's standards of performance. Since the three wings of Indian military i.e. Army, Air force and Navy have some differences in nature of their requirements, there are minor differences in the nature of selection procedure they adopt.

Further selection procedure of officers and non officers also somewhat differs.

### Air Force Selection

In Indian Air force the selections of in officer category for the position of pilots + those of the job of ground duty officers.

Since flying is a mercurial (key) task ever since W.W.I attempts were made to develop pilot



aptitude tests but it was not until w.w II that satisfactory pilot aptitude tests came to be used for selecting air crew. Indian Air force used 3 tests namely -

- (1) Sensory-Motor Apparatus test
- (2) Central velocity test.
- (3) Instrument-Comprehension test.

The purpose of sensory motor test is to measure coordination between eye & hand and find out how well a person can make corrective adjustment similar to those needed by the pilot in aircraft cockpit. The control velocity test measures steadiness in tracking. The test is a measure of a person's anticipatory power in a situation involving rapid change. The Instrument-Comprehension test contains problems relating to flying situation & the candidate is required to think out the solution of the problems. His score is determined by the number of correct solutions given by him. The problems are essentially those faced by the pilot in the cockpit in obtaining information from displays.

The scores on the three tests are pooled & the candidates are graded on the basis of their scores on a 7 pt scale. Once they qualify PAT candidates are subjected to administration of a battery of → intelligence & personality tests (2) administration



of group situational tests. (3) interview by the President, V.P. + the psychological members of the Selection of airmen + apprentices is conducted at Air force recruiting officers. Matriculates between 17-20 yrs of age who have studied Mathematics + Science are eligible. All applicants have to qualify at the test of English comprehension as the medium of instruction is English. There are 32 trades, subsumed under 5 groups for which airmen are selected. The airmen are also screened for GMA (general mental ability) by the means of performance of paperpencil tests. The selection of Air force apprentices is conducted on the lines similar to airmen.

### Selection of Indian Army:-

Officers are selected after a rigorous testing procedure spanning over full 3 days. In the first day there is elaborate psychological testing involving number of personality + intelligence tests. Tests used include -

- (1) Paper and Pencil test (20 mins)
- (2) Raven's Progressive Matrices (45 mins)
- (3) A general questionnaire (untimed)
- (4) Mechanical Knowledge test (15 mins)



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The interviewer's sum their impression about individual candidates in a note indicating the main trends + traits in the candidate + this is technically called as writing out pointers. The interviewers assign to each candidate a grade ranging from 1 to 7. The decision about final selection of the candidate is taken formally at a conference of the President, V.P. + the psychiatrist. For the selection of the soldiers the major emphasis is on the physical tests but for selection in some special trades like driving other relevant tests are also administered. Those selected are recommended for medical examination.

### Navy:-

Selection of Artificer apprentices in Indian Navy is being done with the help of psychological tests. Matriculates within age range of 15 to 17½ yrs. are eligible for selection of and they have to qualify at a written examination in English, Mathematics and science conducted by Naval H.Q. Candidates obtaining 50% or more marks are required to undergo psychological testing + interview. Vacancies are filled from an order of merit list prepared by assigning



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equal weight to interview assessment + aptitude plus intelligence test results.

### Problems in Selection Process:-

- (i) Since English is used in selection process a candidate with a poor foundation in English is handicapped in tests calling for verbal ability & even in group test situations.
- (ii) Some candidates go in for coaching in the tests conducted by S.S.B. Such pretesting exposure on various psychological tests can give these candidates an edge of 25-35 points over those who have not had such exposure. While all psychological tests especially projective tests can't be easily faked but scores on ability tests can be influenced.
- (iii) Another selection technique is that available predictors are far from perfect. They do not always reveal a characteristic that is important determining job behavior.
- (iv) Human error during testing especially in interpretation of projective test responses and interview assessment may also introduce ambiguity in testing.



- (5) Free association test (12½ min)
- (6) TAT (28 min)
- (7) Self Description Test (8 min)

Through the means of projective tests the attempt is to find out and evaluate the concealed part of one's personality & also judge the sincerity with which one has answered. Self description test evaluates the understanding one has of himself whereas R P M measure general intelligence & mechanical aptitude which is a must for military personnel is assessed by Mechanical knowledge test.

On the second & third day the candidates are subjected to various group situational tests. On the second day candidates are put under the charge of GTOs (group testing officers) who lead them through 4 tests -

- (1) group discussion (45 min)
- (2) group planning (10-20 min)
- (3) progressive group task (50 min)
- (4) inter group obstacles race (30 min)

The third day is also spent by the candidates with GTO who lead them through another 4 tests -

- (1) full group tasks (45 min)
- (2) individual obstacles (3 min)



(3) Command task

(4) G.T.O's period (45 mins)

The G.T.O watch the activities of individual candidates to size them up for initiative, leadership, cooperation, team-spirit, endurance, presence of mind aggressiveness. They take short notes about performance of each candidate on various tests and use them to write out "pointers" to each candidate's social personality. The performance of candidates on situational tests given by P.T.O is also used by other members of Service Selection Board (SSB) to arrive at their assessment of the candidate. The program of testing on II<sup>nd</sup> & III<sup>rd</sup> days is so arranged that each candidate can be interviewed by the President, V.P & the psychiatrist member of the S.S.B. The President tries to judge the candidates suitability from the military point-of view by looking into candidates career & G.T.O's observation of the candidates performance in the group tasks. The V.P. is charged with determining whether the candidate is good type of Indian. The psychiatrist's special task is to screen out unstable and antisocial personalities.



## DISTANCE LEARNING THROUGH IT & MASS MEDIA

Distance learning has taken systematic teaching learning process to persons living in isolated areas where facilities for the traditional form of classroom teaching cannot be developed. Further, as distance learning addresses the needs of specific target groups, there is a great variation in the range of programmes offered. Consequently, the basic characteristics of distance education are spatial separation of the teacher from the learner, an age-heterogeneous learner group, easy availability & diversity in the nature of programmes offered.

Open education is a term that has been used interchangeably with distance education. It has been described as "arrangements to enable people to learn at the time, place & space which satisfies their circumstances and requirements". While distance education refers to the process of learning in which there is special & usually temporal distance between the teacher & learner, on the other hand open education (or open learning) refers to the process of making learning available to a learner at a place & time of his/her choice & at the rate suitable to the learner.

Distance education in its earliest form utilised only the print media. The development of computer based technologies has revolutionised teaching & learning process.

Objectives :- The distance education mode was started



with specific objectives to be achieved with are :-

- to provide a system of student centred self placed learning
- to provide a flexible, diversified & open system of education
- to develop by providing wider access to higher education to persons of all ages & particularly to working persons & economically & otherwise handicapped & persons residing in remote areas.
- to provide means of upgrading the skills & qualifications and,
- to develop education as a lifelong activity so

that the individual can refresh and update his knowledge in an existing discipline or to acquire knowledge in new areas.

The advantages of this system is to provide the learner a choice to continue education as a part-time & pastime activity at his own pace, place & time. There are no two opinions over the usefulness of this system, particularly in a vast country like India to literate its people faster and make higher education accessible. Coming to the actual functioning of these centres some problems are yet to be resolved. A majority of distance education centres & schools of correspondence courses of the conventional universities do not have autonomy & freedom to experiment with new courses or the syllabus of the existing courses.



# DISTANCE EDUCATION AND MEDIA

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In order to make education accessible to all & to make it meaningful, exciting and interesting, a new technology need to be linked with the process of learning. The new technology is not only capable of overcoming the barriers that distance presents, but also changes the <sup>very</sup> nature of the instructional process. It is technology that made the move from correspondence to distance education possible.

If the demands of the society for education are to be met successfully, we will have to switch over to an alternative approach of unconventional mode of distance education through mass communication technology currently available. Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. In order to avoid structural dualism, modern education technology must reach out to the most distant areas and to the most deprived sections of beneficiaries simultaneously & the areas of comparative affluence & ready availability.

Media is a kind of message of delivery system which includes all kinds of mechanical devices directed to educational use. These devices are used as means of ~~com~~ communicating our ideas to large number of people who are located in far off areas. Choice of media is crucial when there is no provision for face to face interaction & the ~~stu~~ depend on ~~print~~ material with occasional face to face sup~~p. Distance education programmes can be enriched o~~



made more attractive, effective & satisfying by using a variety of media relevant to the content for learning & the facilities that can be provided should attempt an exploitation of the potential of the variety of powerful media provided by modern technology.

The educational media was confined to classroom lectures supported by print material. Education was imparted with the help of maps, charts, pictures, books, diagrams & till recently through using 11 m.m projectors for educational purposes. Actually the 1970's were the decade of print. The present day mechanical devices have brought about a virtual revolution in diverse field of human activity.

A variety of media are used in distance education, in open universities as well as in institutes of distance learning. They can be classified into two groups:

(a) print media and (b) non-print media.

Print-Media :-

Distance education cannot do without printed course material. It is the mainstay of the instructional system almost everywhere. It is in the form of reading material or in the form of programmed instructional material. It is the most popular medium because it is easy to carry, is comparatively cheaper & can be used according to the convenience of the learners. The learners get the self-instructional material at their homes by post. The material is carefully



prepared by experts in their field of expertise to suit the needs of learners & to help them learn the subject without much assistance from others.

### • Non-Print Media:-

The area of non print-media includes the technologies such as radio & television, telephone, videotex, computers, internet, satellites and soon.

#### Radio :-

The radio has become one of the most powerful media of mass communication in the modern age. It is being increasingly used in advanced countries to overcome the shortage of qualified teachers & suitable books. It can enrich the farthest corners. If the radio has become a necessary instrument of education in advanced & progressive countries, the services it can render are still far greater in country like India.

As a matter of fact, the radio is an effective medium & has been extensively used for educational purposes to spread literacy or to give formal or non formal education all over the world. In addition to the printed materials lessons are planned & written for broadcast from All India Radio. Radio programmes supplement & reinforce instruction imparted through the printed material. The radio is within the reach of common man & can be carried along from place to place.

Television :- The television is a more effective



medium than radio for spreading education, because the language of TV is rich, powerful + expressive. TV lessons are entertaining as well as attractive. A lesson received through the gates of eyes + ears has a double chance of retention by learners. The television screen may become the electronic blackboard of the future.

Radio + TV are not teacher substitute but teaching aids only. They are very useful, produce more elaborate illustrative material, have tremendous potential but they can not stand on their own. In India also the majority of the students of distance education have started making use of T.V. for educational purposes. The U.S.C programmes are becoming very popular these days.

Audio-video cassettes :-

The audio/video cassettes can be played + replayed at home by the learner at his/her will. A learner can stop a particular tape at a point where more details are necessary + can play in slow motion to understand a different difficult point. He need not get up early in the morning or wake up late in the night for radio + TV broadcasts. The use of video enabled a good lecturer to be seen + heard all over the country, without having to repeat his performance. At the moment, the video equipment is costly in India + even in other developing countries + they are not within the reach of most of students.

Telephone — The telephone is a very effective means



of communication. It offers two ways, interactive communications across distance i.e. people can talk to each other, discuss & ask questions. In India this is unlikely to be considered as a medium in distance education.

### Videotex :-

The videotex makes home television sets to function like a computer terminal & retrieve text information & graphics from a remote database. It gives much wider access to information & much wider ease with which new concepts & ideas can be transmitted.

### Computers :-

The mass teaching system has become 'virtually' impossible without a computer. The computer is a very good tool to improve the process of teaching & learning. It is of tremendous use for teaching & learning in diverse situations. Computer based instructions include a broad range of applications. The major classifications of computer application for distance learning are "Computer Assisted Instruction and Computer Management Instruction". The target number of students must be large because of the special skills & time required to develop effective computer aided instruction.

### Internet :-

The internet is the largest, more powerful computer network in the world. It encompasses 1.3 million computers with internet addresses that are used up by 30 million people in more than fifty countries. As more colleges, universities, schools, comp



nies & private citizens are connected to the internet either through affiliations with regional not-for-profit networks or by subscribing to information services provided for profit-companies, more possibilities are open for distance educators to overcome time & distance to reach students. The easy availability of computers & worldwide internet has brought about significant changes in learning-teaching strategies.

In United States & Canada every student has an e-mail account & has either a computer of his own or has easy access to the university computer system. This has solved to a great extent the problems of student & teacher interaction. The present electronic communication system has made the interaction much easier & essentially less costly.

With the access to internet, distance educators & their students can use the Electronic Mail (E-Mail), Bulletin Boards & Worldwide Web (WWW). The WWW and web browsers have made the internet a more user-friendly environment. The ability to integrate graphics, text & sound into a single tool means that novice users do not have to struggle with such a steep learning curve. In addition organisations & individuals can create home pages on their own computers or pages created by others on different computer systems.



In India the U.G.C, the universities and the academic staff college can play an important role in bringing about this computer + internet revolution provided our college teachers + our research scholars are ready to use the new technologies to accelerate the pace of learning.

### Satellite

The satellite is the glamorous medium in distance education. It is used for communicating over long distance. More channels for both radio + television are possible because of the satellite. Programmes are viewed by people in cities as well as in countryside locations. The satellite + television network offers a powerful medium for the dissemination of knowledge, cultural programme + developmental information. A wide area is covered without any loss of quality in the messages sent. The communication channels are not effected by natural calamities as is usually the case with telephone wires.

All teaching + learning programmes can be greatly improved by visual and auditory materials because these make the learning experience far more concrete and memorable. But the media has remained under-exploited by the distance learning system for want of appropriate + relevant software which is the greatest problem of this system. India is making a mark in distance education + we need to develop + grow a large number of efficient committed + trained media persons to implement new technologies in this field.



## PROGRAMMED LEARNING

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Programmed learning is essentially an instructional procedure that requires represents an application of learning principles to educational practice. This instructional procedure requires learner participation, provides immediate feedback & permits each individual to progress at his or her own pace.

According to DL Cook programmed learning is a term sometimes used synonymously to refer to the broader concept of auto-instructional method. According to Fred Stoffel, "The arrangements of the tiny bits of knowledge into a logical sequence is called the programme & its process is called programmed learning"

### Principles of Programmed Instruction:-

The principles of programmed learning are as follows:-

- (1) Small Steps :- The materials to be programmed are divided into meaningful segments & are presented through small steps.
- (2) Immediate Confirmation or Feedback :- As soon as the learner proceeds through programmes, his response, is programme immediately confirmed as to be either correct or incorrect by knowledge of results (KR) and feedback is immediately provided.
- (3) Active Responding :- For the success of any programme the learner has to always respond. Response is core of programmed learning that keeps the learner busy throughout the programme.
- (4) Self Pacing :- An individual learner proceeds through a programme at his own pace without care for the group.



He is not forced to move quickly by the teacher without mastery.

(V) Student Testing :- Regular & continuous testing of the effectiveness of the programme to the particular individual learner is conducted by the teacher with a view to improve upon it.

in his book "Programmed Instruction; Techniques & Trends" has classified principles of programmed instructions into two groups.

(I) Mandatory principle, and

(II) Optional principle

we would discuss each of these principles in brief:

(1) Mandatory principles:

(i) Objective specification :- The programme, while developing a programmed instructional material, specifies the objectives of the programme in behavioural terms. He identifies the terminal behaviour which the learner would be able to show at the completion of the programme. He further specifies the conditions under which the terminal behaviours are to be manifested & states explicit restrictions to be imposed. The standard of judging the acceptable performance is also mentioned in definite terms.

(ii) Empirical testing :- Programmed material is empirically tested material. The programmer, after writing a few initial draft of the programme tries it out in the following three phases:



- (a) Individual try out -- The first draft of the programme is tested on an individual in face to face testing. The reactions of the individual recorded for each frame.
- (b) Small group try out :- After modifying the programme on the basis of individual try out, the programme is tested on five to ten representative students of the class for which it is developed.
- (c) Field try out :- At the third stage, the programme, after modification on the observation of small group, is administered in actual class room conditions.
- (d) Self-pacing :- In programmed learning, the learner decides the rate at which he progresses through the programme. He adjusts the pace of the work to his own ability + motivation level. He is not forced to work with the speed of other students of the class. The principle of self-pacing incorporates the concept of individualised instruction.

### ii) Optional Principles :-

- (1) Overt Responding :- The learners are asked to respond frequently to explicit or implicit questions as they progress through the programme. The overt response requirement of programmed learning insures that the learner will become and remain active + attentive to the instructional material. The active involvement of the learner increases the learner's motivation.
- (2) Immediate Feedback :- Feedback is information fed-



back to the learner. It is the knowledge of the result of the performance of the learner. When a learner works through a programmed text, he is immediately fed-back by comparing his response with the response of the programme.

(3) Small step size :- As already described the body of knowledge is broken into small units (Frames) of meaningful information and presented one frame at a time.

Psychological principles underlying Programmed Learning:-

Ernest R. Hilgard has summed up the psychological principles of learning which support programmed learning.

(1) Programmed learning recognises individual difference by beginning where the learner is & by permitting him to proceed at his own pace. It is possible that programmed learning may succeed in reducing individual differences because of these features.

(2) Programmed learning requires the learner to be active. Since learner is active he/she feels more involved and learns faster.

(3) Programmed learning provides immediate knowledge of results.

(4) Programmed learning emphasises the organised nature of knowledge because it requires continuity between the easier (earlier) concepts and harder (later ones).

(5) Programmed learning provides spaced review in order to guarantee the high order of success that has become a standard requirement of good programmes.

(6) Programmed learning reduces anxiety because the learner is not threatened by task.



Advantages : - Programmed instructions has innumerable advantages over the traditional methods of learning that have been proved through research. A few of those are enumerated as under :

- (I) Foreign languages drill in spelling, factual information can best be taught through programmed instruction.
- (II) Teachers being free from routine classroom activities can devote more independent-time & think more creatively in case of programmed instruction.
- (III) Social & emotional problems, especially in the test, have been effectively dealt through programmed instructions in the classroom. The self instructional materials have successfully eliminated the problem of indiscipline inside the class.
- (IV) It caters for the individual needs through individualised instruction & self-pacing & can better serve a heterogeneous population of learners.
- (V) It helps the teacher to clearly diagnose the needs & problems of the individual learner & correct those on personal basis without any delay that is quite absent in a traditional classroom of uncountable students.
- (VI) Learning becomes interesting through programmed instruction. It provides challenge to the individual learner to utilise his ability to the full extent. Confirmation of correct responses provides sufficient motivation to proceed at a quicker speed towards cent-per cent mastery.



### Limitations of Programmed Learning:-

Though the supporters of programmed learning make high claims + point-out many advantages, there are certain limitations in programmed learning which require presence of the teacher.

- (i) In programmed learning students learn how to search out the facts needed for a given purpose. Eg. students can not develop the habit of using a dictionary or going to the library with the help of a teaching machine or programmed learning.
- (ii) In the rapidly changing world new situations arise quickly. In order to function effectively in new situation and adjust accordingly, the students require to develop certain personality qualities + social maturity.
- (iii) The third limitation of the programmed learning is that it does not develop in students the ability to discover problems for themselves + solve them on their own.
- (iv) Programmed learning does not develop creativity among students to the extent a teacher can.
- (v) Teaching machines provide programmed learning in a scientific manner + thus programmed is the science of teaching. As regards the art of teaching it is possible only with the help of a teacher.
- (vi) Teaching machines + programme learning ignore the human factor + do not provide opportunities for human relations, which is now regarded as the fourth R. The



3- Rs being reading; writing, & arithmetic.

(vii) Another limitation in programmed learning is that it does not help in socialisation of students. It is in peer groups play groups & work groups that social development of children takes place.

Application of programmed Learning :-

Programmed instruction can be applied where ever learning occurs, whether in the classroom or in the industrial setting. In the classroom it helps in regular instruction, enrichment of learning & for remedial instruction. In industry it helps disseminating the technical innovations through refresher courses for up-to-date professional development. This can also be applied in teaching military sciences & in defence. As for example teaching of electronic troubleshooting course to naval trainees becomes easier & effective through programmed instructions.

The use of programmed learning finds application in the following areas -

1. Teacher's training :- Programmed material can be used at all levels of teacher education programmes. Many teachers need to keep abreast with knowledge & latest developments in the field. In these areas programmed instruction is of considerable aid.

2. Correspondence Courses :- Education through correspondence courses or distance education is becoming very popular. It is emerging as a very successful media for educating the masses as well as those who want to continue their education.



- 3- Non formal Education :- Non-formal education is becoming highly popular in India, especially with unprivileged groups + masses. Non-formal education makes use of programmed learning.
- 4- Use of programmed material in air force - Programming techniques can be used to train cadets in air force.
- 5- Use in Banks :- In U.S.A all banks use programmed material for training cashiers.
- 6- Use for gifted children :- Carefully programmed material can be used to enrich the curriculum to cater to the needs of gifted children.
- 7- Vocational training :- Programmed instruction has been applied to vocational training + psychotherapy. A technique of programmed therapy has been recently developed to correct deviants + to rehabilitate emotionally disturbed children.
- 8- Modification of deviant behaviour :- Programmed instructional material has been used very successfully to modify the behaviour of deviant children. A project has been undertaken at Draper correctional centre Elmore Alabama. The population consisted of young sociopathic offenders. The objective was to reduce the rate of offences + to rehabilitate the offenders in the society. The immediate aim was to raise the academic standard + to develop vocational proficiency in the inmates.



To achieve the objectives, the project staff utilised the programmed instruction adapting to the needs of individuals. The result of the project were very significant.

4. Programmed instruction and exceptional children :-

Programmed instructional material has been used on disturbed children + slow learners with great success.

Eldred + his coworkers conducted a study on slow learners + under-achievers with programmed instructional technique. The students showed great improvement in their performance.

Special programmes should be developed for exceptional children. Abraham 1966 warned about the false assumption that a programme developed for so-called typical children will work for exceptional children disadvantaged population dropouts delinquents + others.

Different type of programming :-

There are three different types of programmed learning :-

- (a) Linear Programming,
- (b) Branching +
- (c) Computer Assisted Instruction

We would discuss each of these briefly.

Linear Programming :-

This type of programming was pioneered by B.F. Skinner. It is defined as "a programmed material sequence in which each student proceeds in a straight line through a fixed set of items".

Skinner after extensive experimentation on rats + pigeons established that animals or human beings can be led to desire



goal by presenting carefully structured material in small steps provided each step is reinforced or rewarded by favourable experience.

Linear programming has the following characteristics:-

- (i) Linear Programming generally involves breaking the information in small steps of 40 to 50 words each. This is called as a frame. The learner must respond to each frame in succession by filling in words or phrase in a blank.
- (ii) The material are arranged in order. In such type of programme, the learner advances in a single series of short steps which are designed to ensure a high rate of correct responding to the questions (frames). Same path is followed by each learner. The learner starts from his initial behavior to the terminal behavior following straight line sequence. All learners pass through the same path.
- (iii) In a linear programme, responses are controlled by the programmer. The responses and their order are fixed. The learner has no choice to respond in his own way.
- (iv) In linear programme, the emphasis is laid on response. The learner must respond to each and every frame in order for the learning to occur.
- (v) As soon as the learner responds to the frame he can immediately compare his response with the response of programme. There is quick feedback.



- (VI) In the beginning prompts or cues are supplied to facilitate learning to occur.
- (VII) Cheating is discouraged by not revealing the answer to the learner.
- (VIII) The linear types of programme is useful in that programmed learning, which aims at developing in the learner simple discrimination, learning tasks of both verbal + motor types, perceptual learning + sequential learning.

### Limitation of Linear Programming:-

#### (1) Lack of motivation:-

It is alleged that learning becomes dull and learner experience monotony + boredom. It takes too much time to teach very few points.

#### (2) Freedom of choice is curtailed:-

The learner has no choice of his own to respond, thus it is alleged that creative imagination of learner is inhibited.

#### (3) Costly:-

It has been found that preparation of programmed material requires too much paper + time.

### (i) Branching:-

This form of programming was developed by Norman A Crowder. In this programme the learner is presented with a longer unit of materials followed by a multi choice-type item.

The response to <sup>the</sup> item determines which of several units he will be directed to work on next.

The branching type of programme is useful in developing the ability to do problem solving + perform various types of analytical tasks.



Sawrey + Telford have compared the linear programme + branching programme as given below

Characteristics of Linear Programme	Characteristic of Branching Programme
1- Sequence of material is predetermined	1- Sequence is determined by learner's choice
2- Is non interpretative.	2- Can be diagnostic + interpretative
3- Uses relatively small steps	3- May use steps of any size
4- Is largely non-response	4- Is responsive to the individual student's needs
5- Keeps error to a minimum by providing many cues + prompts	5- Uses errors for instructional purposes.
6- Is minimally adaptive	6- Is highly adaptive.

### (131) Computer Assisted Instruction :-

Computer assisted instruction (CAI) is a natural outgrowth of application of Programmed Instruction. The aim of CAI is to provide individualised instruction to meet the special needs of each learner. It needs some efficient and flexible device that can store a significant amount of organised information + use selected portion to meet the needs of individual learner. A computer is such a device which can cater to the needs of individual learner. Computer can store a vast amount of information suitable to the needs of individual learner.

A major advantage of computers is their memory + storage capabilities which make possible various types of interactions with the learner, which is not possible with programmed instruction procedures. These capabilities permit



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drill + practice, problem solving simulation + gaming forms of instruction, + certain forms of individualized instruction. To date computer-assisted instruction procedures have been rarely used in educational field in India due to its high cost.

Although long-range future developments (especially in reduced costs) may cause computer-assisted instruction to blossom as a training procedure in education, its use within the foreseeable future would probably be limited to special circumstances in which computer facilities are available + in which costs can be spread over many trainees.

Several universities have C.A.I. centres, which are used chiefly for remedial programs. As a supplementary learning aid, or for particular courses in which this approach has proved effective. Some progress is being made in the introduction of C.A.I. at the high school level. Adoption have been slow because of cost + because of problems involved in developing the required hardware + software + in training school personal in the use of such instructional systems.

An especially promising application at the elementary school level is illustrated by the Stanford University C.A.I. reading program for children in the first three grades (Atkinson 1974). The object of this program was "to develop low-cost C.A.I. that supplements classroom teaching + concentrates on those tasks in which individualisation is critically important". The student