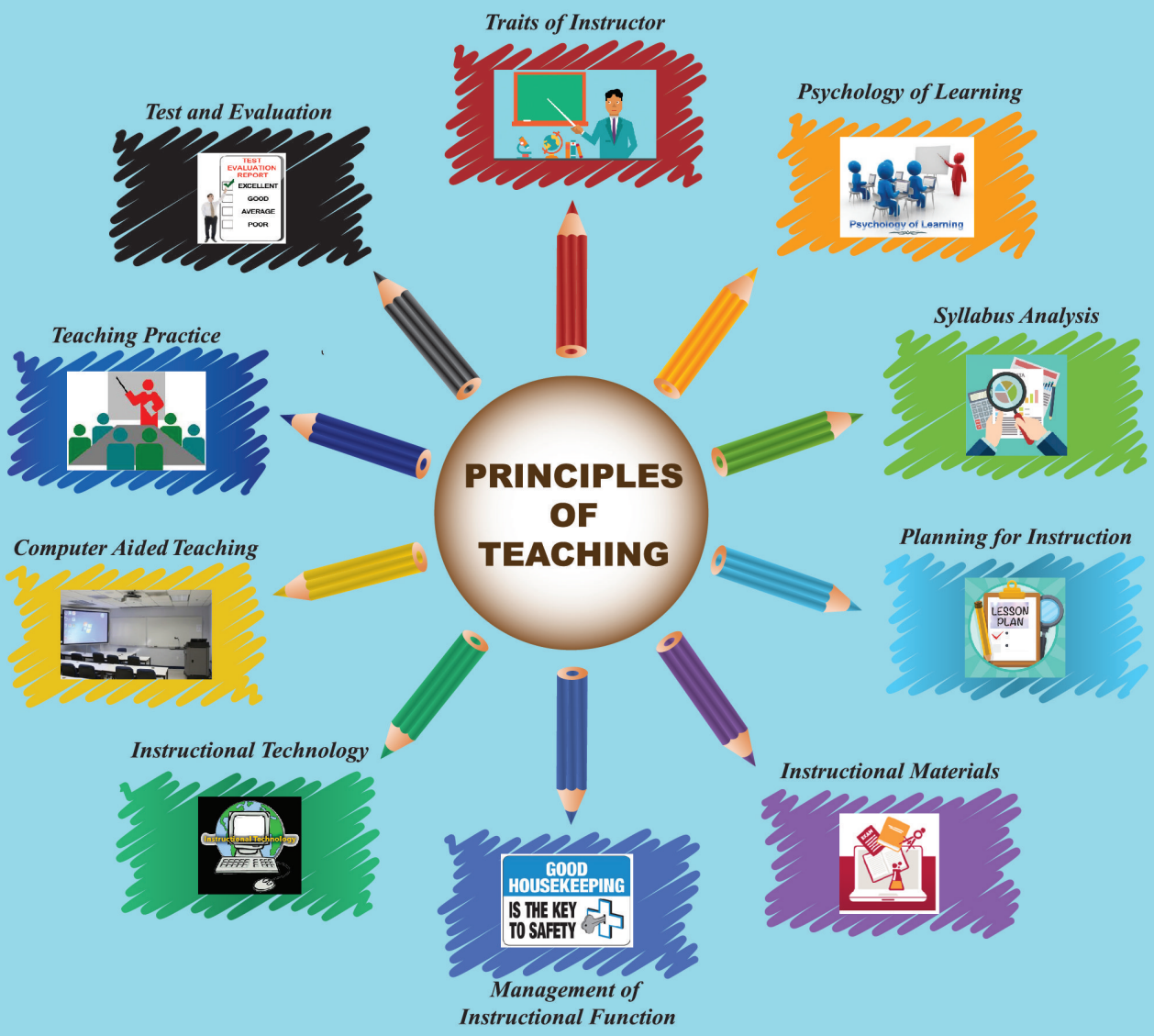
Skill India
कौशल भारत-कुशल भारत

Special Course on

PRINCIPLES OF TEACHING

(1 Month)



Directorate General of Training

Directorate General of Training,
Ministry of Skill Development & Entrepreneurship,
Government of India

Industrial Training Institute

NATIONAL INSTRUCTIONAL MEDIA INSTITUTE, CHENNAI

Special Course on

PRINCIPLES OF TEACHING

Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA

NATIONAL INSTRUCTIONAL MEDIA INSTITUTE, CHENNAI

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P. B. No.3142, CTI Campus, Guindy Industrial Estate,
Guindy, Chennai - 600 032.
Phone : 044 - 2250 0248, 2250 0657, 2250 2421
Fax : 91 - 44 - 2250 0791
email : chennai-nimi@nic.in, nimi_bsnl@dataone.in
Website: www.nimi.gov.in

FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, by 2020 to help them secure jobs as part of the National Skills Development Policy. The instructors imparting training to the trainees in Industrial Training Institutes (ITIs) plays a major role in providing skilled manpower.

The objective of the Craft Instructor Training (CITS) is to train Instructors in the techniques of transferring hands-on skills, in order to train semi-skilled / skilled manpower for industry. Structure of training programme is such that comprehensive training both in skill development and training methodology is imparted to the trainees. The skill training is dynamic in nature especially in the present context of technological changes. This demands a proper understanding of the original ideas, theories and systems that are fundamental base of a good instructor. As an instructor /trainer it is of utmost importance that the various nuances of good training practices are understood and followed in true spirit.

However there are large numbers of instructors in the training system who are working for long time, who could not undergo CITS training which can be attributed to various factors. As the instructors are imparting training since many years, it is apparent that they might have acquired some level of instructor competencies.

Hence to bring competencies of this pool of instructors at par with the defined competencies under CITS, a special course of 1(one) month duration is being introduced on Principles of Teaching (POT). This will facilitate them to recognize their prior learning.

To suit this requirement, National Instructional Media Institute (NIMI), Chennai has come up with instructional material for Principles of Teaching (POT) required for CITS training. I have no doubt that with the development of this instructional material, the participants will be equipped with adequate instructional skills, information, enhanced capacity, more adaptable to changing environment thus strengthening skill ecosystem as a whole.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

RAJESH AGGARWAL
Director General/ Addl. Secretary
Ministry of Skill Development & Entrepreneurship,
Government of India.

New Delhi - 110 001

PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Directorate General of Training, Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of the Federal Republic of Germany. The prime objective of this institute is to develop and provide instructional materials for various course as per the prescribed syllabie under the skill eco system.

The instructional material on Principles of Teaching (POT) will strengthen standardization of teaching pedagogy for instructors, imparting training to ITIs across the country and is a unique on its own having substantial informations on Instructor quality, teaching practice, learning psychology, instruction planning, instructional materials and technology, NSQF Syllabus analysis, testing and evaluation, organization and management of Instructional functions and Computer based teaching.

IMPs also deals with the complex skills required to be developed for an effective team work. Necessary care has also been taken to include important skill areas of allied trade as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an Institute helps both the trainer and management to impart an effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from training institutes under the Directorate General of Training (DGT).

NIMI would like to take this opportunity to convey sincere thanks to Shri. RAJESH AGGARWAL, Director General / Addl. Secretary, Ministry of Skill Development & Entrepreneurship, for his initiative and guidance in improving the quality of instructor and also strengthening the network of instructors, which will improve upon the skill ecosystem in the country.

R. P. DHINGRA
EXECUTIVE DIRECTOR

Chennai - 600 032

ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers to bring out this Instructional material **(Principles of Teaching)** Under Crafts Instructor Training Scheme (CITS).

MEDIA DEVELOPMENT COMMITTEE MEMBERS

Shri. Saravana	-	Training Officer NSTI (W) Bangalore.
Shri. V. Dhana Sekaran	-	Assistant Director of Training (Retd.), MDC Member, NIMI, Chennai.
Shri. A. Vijayaraghavan	-	Assistant Director of Training (Retd.), MDC Member, NIMI, Chennai.
Shri. T. Muthu	-	Principal (Retd.), DET, Tamilnadu. MDC Member, NIMI, Chennai.
Shri. A. Jayaraman	-	Training Officer (Retd.), MDC Member, NIMI, Chennai.
Shri. K. Srinivasa Rao	-	Joint Director, Co - ordinator, NIMI, Chennai - 32
Shri. V. Gopala Krishnan	-	Assistant Manager, Co - ordinator, NIMI, Chennai - 32

NIMI records its appreciation to the Data Entry, CAD, DTP Operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks, the invaluable efforts rendered by all other staff who have contributed for the development of this Instructional Material.

NIMI is grateful to everyone who has directly or indirectly helped in developing this instructional Material.

INTRODUCTION

Special course on Principles of Teaching

This manual consist of theoretical knowledge of Principle of Teaching. The duration of course is one month (4 weeks) consist of 20 sessions/week, each session is 2 hours duration. This course is intended for the Instructors of the Trades for which CITS course is not available and instructors who are imparting training on CTS courses for more than 3 years without CITS training.

This manual contents are sequenced according to the syllabus planned by CSTRI. Attempt has been made to provide sufficient information related to the units and lessons. The main objective of this course material is to fulfill the need of the craftsman instructor program. The units and the time allotted for each unit are given below

The manual is divided intoTen Units.

Unit 1	Traits of Instructor	08 Hrs
Unit 2	Psychology of learning	20 Hrs
Unit 3	NSQF and Analysis of syllabus	24 Hrs
Unit 4	Planning for Instruction	16 Hrs
Unit 5	Instructional Materials	08 Hrs
Unit 6	Test and Evaluation	12 Hrs
Unit 7	Organisation and Management of Instructional Functions	16 Hrs
Unit 8	Instructional Technology	16 Hrs
Unit 9	Computer aided Teaching	08 Hrs
Unit 10	Teaching practice	32 Hrs
	Total	**160 Hrs**

While developing this manual a sincere effort has been made to prepare each unit instructional material, which will be easy to understand and can be carried out even by the below average personnel. However the development team accept that there, is a scope for further improvement. NIMI look forward to the suggestions from the experienced training faculty for improving this manual

CONTENTS

SYLLABUS

Unit No. I Broad Vocational Scenario & Traits of Instructor

Learning Outcomes to be achieved from this unit:-

- **Develop ideal instructor characteristics.**

Lesson No.1.1 Overview of Vocational Scenario in India
Lesson No.1.2 Roles and Responsibilities of Instructor
Lesson No.1.3 Essential traits of a good Instructor
Lesson No.1.4 Characteristics of good Instruction and common defects in Instruction

Unit No. II Psychology of Learning

Learning Outcomes to be achieved from this unit:-

- **Prepare the trainees for the class using the basics of Educational Psychology.**
- **Motivate the trainees for the required training**

Lesson No. 2.1 Educational Psychology and teaching
Lesson No. 2.2 Principles of learning & teaching
Lesson No. 2.3 Laws of learning & Theories of learning
Lesson No. 2.4 Motivation in teaching & learning process

Unit No. III NSQF and Analysis of Syllabus

Learning outcomes to be achieved from this unit:-

- **Read and understand the competency based curriculum or NSQF compliant curriculum (NSQF format)**

Lesson No.3.1 NSQF and implementation in vocational training
Lesson No.3.2 Job roles, learning outcomes and assessment Criteria
Lesson No.3.3 Analyzing the syllabus - break - up of syllabus and schedule of instruction with time duration.
Lesson No.3.4 ADDIE Model of instruction.

Unit IV - Planning for instruction

Learning Outcomes to be achieved from this unit:-

- **Use questioning technique effectively.**
- **Plan and prepare the instructional material required for imparting training.**

Lesson No.4.1 Lesson Plan
Lesson No.4.2 Question & questioning Techniques
Lesson No.4.3 Skill and its basic elements
Lesson No.4.4 Phases of Skill Learning
Lesson No.4.5 Demonstration Plan

Unit No. V Instructional Material

Learning Outcomes to be achieved from this unit:-

- **Plan and prepare the instructional material required for imparting training.**

Lesson No. 5.1 Write Instructional Material

Lesson No. 5.2 Operation Sheet & Job Sheet

Lesson No. 5.3 Information Sheet & Assignment Sheet

Unit No. VI Test and Evaluation

Learning Outcomes to be achieved from this unit:-

- **Test and evaluate the trainees using different assessment techniques.**

Lesson No.6.1 Different levels of learning domain according to bloom Taxonomy and its correlation with NSQF

Lesson No.6.2 Test & Characteristics of a good test

Lesson No.6.3 Evaluation of Theory & Practical Test Kirkpatrick evaluation model

Lesson No.6.4 Rules for preparation of objective type test items

Lesson No.6.5 Plan assessment activities and assess competence

Lesson No.6.6 Training on NSQF implementation manual

Unit No. VII Organisation and Management of Instructional Functions

Learning Outcomes to be achieved from this unit:-

- **Manage the training facilities and follow the concept of 5S in housekeeping**

Lesson No. 7.1 Teaching and managerial responsibilities of classroom and its management.

Lesson No. 7.2 Concept of 5S and its application. Housekeeping and safety.

Lesson No. 7.3 Leadership traits, functions and styles

Unit No. VIII Instructional Technology

Learning Outcomes to be achieved from this unit:-

- **Plan and use modern training aids to make the communication between trainee and instructor more effective.**

Lesson No. 8.1 Introduction to Instructional Technology

Lesson No. 8.2 Different types of media & its impact in teaching and learning

Lesson No. 8.3 Classroom Communication

Lesson No. 8.4 Different types of teaching - learning Aids (Projected & Non Projected Aids)

Lesson No. 8.5 Role of various display boards in instruction

Unit No. IX Computer Aided Teaching

Learning Outcomes to be achieved from this unit:-

- **Make an effective presentation using power point and other IT tools.**

Unit - X Teaching practice

Learning Outcomes to be achieved from this unit:-

- **Impart effective training as per best teaching and training practices**

LEARNING/ ASSESSABLE OUTCOME

On completion of this book you shall be able to

- **Develop ideal instructor characteristics.**
- **Prepare the trainees for the class, using the basics of Educational Psychology.**
- **Motivate the trainees for the required training.**
- **Read and understand the competency based curriculum (NSQF format).**
- **Use questioning technique effectively.**
- **Plan and prepare the instructional material required for imparting training.**
- **Test and evaluate the trainees using different assessment techniques.**
- **Manage the training facilities and follow the concept of 5S in house keeping.**
- **Plan and prepare the power point presentation and videos for the effective training using modern training aids.**
- **Make an effective presentation using power point and other IT tools.**
- **Impart effective training as per best teaching and training practices.**

UNIT - I

BROAD VOCATIONAL SCENARIO & TRAITS OF INSTRUCTOR

Learning Outcomes to be achieved from this unit:

- **Develop ideal instructor characteristics**

Theory 1.1

I Multiple Choice Question items

Choose the correct answer:

1 Which type of training that provides skill and education to prepare for a job?

A Implant Training B Vocational Training
C Apprenticeship Training D Curriculum Training

2 What is the name of the body which improve the consistency of outcomes in the skill land scape?

A NCVT B SCVT
C NSQF D MSDE

3 What is the name of the body which enhance the skill training facilities for woman in India?

A NCVT B NSTI
C CSTRI D NSDA

4 In which year guide lines for setting up of ITOT's were issued?

A Jan 2012 B March 2013
C April 2014 D August 2015

5 What is the percentage of Apprentices engaged in the factories?

A 1.5% to 2.00% of the total strength of workers
B 2.00% to 5.00% of the total strength of workers
C 2.50% to 10.00% of the total strength of workers
D 3.00% to 12.00% of the total strength of workers

6 What is the name of the department that is awarding certificates for training of graduate and technicians?

A NCVT B DGET
C NSDA D DEMH

Theory 1.2

7 What is the name of the person who provides live interactions to the learners during a learning activity?

A Teacher B Trainer
C Learner D Instructor

8 What is the name of the person who guides and supports some one in acquiring new physical skills by participating in the physical activities and demonstrating to achieve the desired goals in systematic manner?

A Teacher B Trainer
C Learner D Instructor

9 What is the name of the person whose main job is to conduct training programme, which includes planning, preparation, presentation, testing and evaluation?

A H.O.D of the department B Principal
C Instructor D Learner

10 What the name of the role by which the instructor should always update their knowledge, upgrade their skill with new techniques?

A As a student B As a manager
C As an organizer D As a principal

11 What is the name of the responsibility which take maximum efforts to develop his personality and cultivate pleasant manners?

A Towards learners/trainees
B Towards the society and Nation
C Towards him/herself
D Towards the profession

Theory 1.4

16 What action to be taken by the instructor before teaching, systematic arrangements made based on available resources?

A Planning B Assessment
C Preparation D Method

17 Which type of step the introductory question is asked?

A Preparation B Presentation
C Summary D Assignment & Test

18 What is the name that it is essential part in teaching learning activity and also it will help the instructor for self evaluation?

A Planning B Questioning
C Evaluation D Feed back

19 What is the name of the term in educational system which is define as a learned tendency to evaluate things in proper way?

A Aptitude B Attitude
C Observation D Cumulative

20 Which one of the following is stated as an ability or capacity to perform a particular job?

A Skill B Technique
C Method D Technology

Principles of Teaching Theory 1.1
Broad Vocational Scenario & Traits of Instructor

Overview of vocational scenario in India

Objectives: At the end of this lesson you shall be able to
- **state the importance of vocational training in India**
- **brief the governing Agencies of vocational training in India**
- **describe the various schemes of NCVT**
- **brief the various skill implementing agencies.**

The term "vocational" means providing skill and education that prepare for a job, or training of skilled craftsman.

The skilled craftsman has been defined by the Planning Commission thus, a worker who belongs to an occupation generally accepted as skilled and found in several industries.

The Government of India started the war technicians training scheme in the year 1940 at Koni Bilaspur, now in Chhattisgarh state, long before the new factory system of manufacturing took root on Indian.

The war technician scheme was followed by the technical training scheme in 1946. All these schemes were modified and merged into a comprehensive scheme known as vocational training scheme, designed for training demobilised service personnel, but was wound up in july 1950.

After the completion of ex-servicemen's training schemes, the training of civilians was started on a National basis by establishing industrial training institutes (ITIs) by the Government of India in 1950. Under the head of Directorate General of Employment and Training (DGET) in the Ministry of Labour and Welfare.

Now its named as Director General of Training (DGT) under the Ministry of Skill Development Entrepreneurship

Directorate general of training (DGT)

Directorate General of Training (DGT) in Ministry of Skill Development & Entrepreneurship is an apex organization for development and coordination of the vocational training including women's vocational training of the employable youth in the country and to provide skilled manpower to the economy. Two Directorate General of Employment & Training (DGE&T) working under deputy director general (Training) & Deputy Director General (apprenticeship training) along with their support systems were transferred to ministry of skill development & entrepreneurship.

Major roles of DGT include

- Policy formulation on vocational training
- Laying down Standards
- Revise course curricula
- Granting affiliation
- Trade testing
- Certification

Functions

DGT affiliated institutions offers a wide range of training courses catering to the needs of different segments in the labour market. Courses are available for school leaver, ITI pass outs, ITI instructors, industrial workers, technicians, junior and middle level executives, supervisors/foremen, women, physically disabled persons and SC/STs. It also conducts training oriented research and develops instructional media packages for the use of trainees and instructors etc.

DGT acts a Secretariat and implementing arm of National Council for vocational training.

National council for vocational training (NCVT)

National council for vocational training (NCVT) a tripartite body was set up through a resolution by Ministry of Labour in 1956, to advice on issues relating to "Vocational training" including craftsman training scheme such as designing of curricula, maintaining quality standards, deciding norms for affiliation, granting affiliation to institutes, trade testing and certification.

After being transferred to MSDE, NCVT has been partially modified and re-constituted under the chairmanship of Honourable Minister of State (IC). Skill development and entrepreneurship, w.e.f. 13/05/2015.

The council consists of representatives of central ministries, State Governments, employers organisations, employees organisations, secretarial support to NCVT is provided by DGT. Professional learned bodies. Experts and representatives of SC/ST.

The major functions of the NCVT are:

- Establish and award National trade certificates in engineering trades
- Prescribe standards in respect of syllabi, equipment, and scale of space, duration of courses and methods of training:

- Arrange trade tests in various trade courses and lay down standards of proficiency required for a pass in the trade test
- Arrange for ad-hoc or periodical inspections of training institutions in the country
- Lay down conditions & to recognize training institutions run by government or by private agencies for purposes of the grant of National trade certificates;
- Prescribe qualification for the technical staff of training institutions;
- Prescribe the standards and conditions of eligibility for the award of National trade certificates
- Recommend the provision of additional training facilities wherever necessary and render such assistance in the setting up of additional training institutions or in the organisation of additional training programmes as may be possible.

Similar councils known as State Council for Vocational training (SCVT) are constituted to advice respective state government on issues relating to skill development. These SCVTs have been advised by NCVT to be registered as societies under society registration ACT 1861.

NCVT MIS portal: Directorate general of training has launched the NCVT MIS portal to access online information related ITIs including:

- Information of all affiliated government & private industrial training institutes (ITIs).
- Candidates seeking skill training/apprenticeship training
- Employers seeking skilled workers
- Citizen information & feed back
- ITI & approved courses
- Enrolment transparency
- Training/academic schedule
- Visibility on self -profile and training progress
- On-line access to e-mark sheet & e-certificates
- E-mail & SMS alerts
- Placement facilitation
- STAR grading of ITIs

More details related to NCVT - MIS portal is available at www.ncvtmis.gov.in

Regional Directorate of Apprenticeship training (RDATs) are responsible for monitoring the implementation of the apprenticeship act for trade apprentices in central government undertaking/departments

At present, there are 6 RDATs which are located at Chennai (Tamilnadu) Faridabad (Haryana), Hyderabad (Andhra Pradesh), Kanpur (Uttar Pradesh), Kolkata (West Bengal), and Mumbai (Maharashtra).

National Skill Development Agency (NSDA)

The National Skill Development Agency (NSDA) is a quality assurance and policy research body of Ministry of Skill Development and Entrepreneurship in the skilling ecosystem. The National Skill Development Agency was notified in june 2013 by subsuming the prime minister's National Council on Skill Development, the National Skill Development Coordination Board and the office of the adviser to PM on skill development. NSDA is an autonomous body registered as a society under the society's registration act 1860. Ministry of Skill Development and Entrepreneurship is the nodal ministry for the NSDA.

As per the gazette notification dated 6th June, 2013 the functions assigned to the NSDA include:

- Take all possible steps to meet skilling targets as envisaged in the 12th five year plan and beyond
- Ensure that the skilling needs of the disadvantage and the marginalized groups like SCs, STs, OBCs, minorities, women and differently able person are taken care of.
- Nodal agency for state development missions
- Coordinate and harmonize the approach to skill development among various central ministries and departments, state governments. NSDC and private players.
- Anchor and operationalize the NSQF.
- Raise extra-budgetary resources for skill development
- Evaluate existing skill development schemes to assess their efficacy, and to suggest corrective action.
- Create and maintain a national data base related to skill developement including development of a dynamic Labour Market Information System (LMIS).
- Affirmative action for advocacy.
- Discharge any other function entrusted by the government.

Additional functions of NSDA as per national policy for skill development & entrepreneurship, 2015 are as under

- To establish and operationalise a Quality Assurance Framework (QAF) embedded in NSQF to improve consistency of outcomes in the skills landscape, which include laying down a framework for training. assessment and certification processes and agencies in the country.
- Establishment of a National Skill Research Division (NSRD) housed under NSDA which will serve as a think tank for inputs on research related to skill development and evolve as a credible research organization in skill development at the national level. It aims to serve as an authentic, qualitative and

accessible think tank for research related to skill development in India.

- Develop national protocols for registration and accreditation of private training providers.
- Promote use of skill India logo on skill certificates by SSCs/agencies adhering to the QA framework.

National Skills Qualifications Framework (NSQF)

The National Skills Qualifications Framework (NSQF) is a competency - based framework that organizes all qualifications according to a series of levels of knowledge, skills and aptitude. These levels, graded from one to ten, are defined in terms of learning outcomes which the learner must possess regardless of whether they are obtained through formal, non-formal or informal learning.

NSQF in India was notified on 27th December 2013. All other frameworks, including the NVEQF (National Vocational Educational Qualification Framework) released by the ministry of HRD, have been superseded by the NSQF. Government funding is also expected to be on preferential basis for NSQF compliant training/ educational programmes/courses.

The NSQF would facilitate a paradigm shift from education focused on inputs to an outcomes/competency based education - which would help in the recognition of prior learning, and simultaneously enable the alignment of the Indian qualifications with international ones.

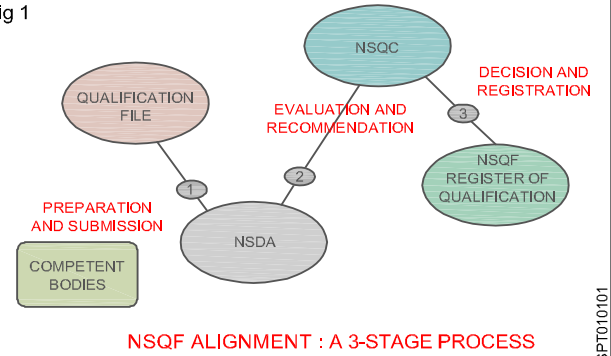
It is a competency based framework that organizes qualifications into ten levels, with the entry level being 1, and the highest level being 10.Each of these levels is characterised by the following categories of competencies.

- **Professional knowledge** - what the person must know at that level.
- **Professional skills** - what the person should be able to do at that level.
- **Core skills** - which include soft and interpersonal skills.
- **Responsibility** - the degree of supervision that needs to be exercised over the person while doing the job, or the degree of supervision that person is capable of exercising over others.

Process of NSQF alignment

Awarding bodies submit their qualifications/courses to NSDA in order to seek approval from NSQC for NSQF alignment. The awarding bodies submit their information in a template called qualification file. The qualification file is the means by which awarding bodies present evidence to the National Skills Qualification Committee that their qualifications are NSQF compliant.

Fig 1



NSQF ALIGNMENT : A 3-STAGE PROCESS

A qualification file captures all necessary information to establish NSQF compliance for a qualification. The qualification file is a folder which contains.

- A summary sheet in which information about the qualification must be entered.
- A structured document in which information showing that the qualification meets the NSQF requirements must be entered.
- Supporting evidence attached to the qualification file - i.e. already - existing documents which are included to back up the information in the completed file.

Qualification file template

Qualification

- Title enter the full title of the qualification as it well appear on certificates title should be as clear and informative as possible.
- Any identification number which has been formally allocated to the qualification by the certificating body should be included here.

Nature and purpose of the qualification

- Indicate the nature of the qualification. For example, a qualification pack (QP) a trade certificates aligned to QP, a diploma which incorporates National Occupational Standers (NOS), or a Qualification which is not directly linked to any QP or NOS.
- Indicate the main purpose of the qualification and the target learners - e.g designed to get people in to work, a qualification intended for people already in work, a qualification to allow people to add new skills based on technological change.

Craftsmen Training Scheme (CTS)

The Directorate General of Training (DGT) (erstwhile DGE &T, Ministry of Labour and Employment) in the Ministry of Skill Development and Entrepreneurship, Government of India initiated Craftsmen Training Scheme (CTS) in 1950 by establishing about 50 Industrial Training Institutes (ITIs) for imparting skills in various vocational trades to meet the skilled manpower requirements for technology and industrial growth of the country. The

second major phase of increase in ITIs came with the oil-boom in West-Asia and export of skilled manpower to that region from India. Several new private ITIs were established in 1980's in southern states mostly in Kerala, Karnataka and Andhra Pradesh, etc. from where trained craftsmen found placement mainly in Gulf countries. In 1980, there were 830 ITIs and the number rose to 1900 ITIs in 1987. During 1990's, the growth of ITIs had been steep and presently there are over 10,750 ITIs (2275 in Govt. & 8475 in Private Sector) having a total seating capacity of 15.22 lakhs.

Under the constitution of India, Vocational training is the concurrent subject of both Central and State Governments. The development of training schemes at National level, evolution of policy, laying of training standards, norms, conducting of examinations, certification, etc. are the responsibilities of the Central Government, whereas the implementation of the training schemes largely rests with the State Govts. /UT Administrators. The Central Govt. is advised by the National Council of Vocational Training (NCVT), a tripartite body having representatives from employers, workers and Central/State Governments. Similar Councils termed as State Councils for Vocational Training are constituted for the same purpose by the respective State Governments at state levels.

Semester system

Structure of training programme has been converted into semester system in place of long term, W.e.f August, 2013

The courses have been designed to impart basic skills and knowledge in the trades so as to prepare trainee for employment as a semi-skilled worker or for self-employment.

As 70% of the training period is allotted to practical training and the rest to subjects relating to Trade Theory, Workshop Calculation & Science, Engineering Drawing, therefore, emphasis is on skill building.

For over all personality development of trainees, a course on "Employability Skill" has been introduced from session July, 2012. The subject cover topics introduced on IT Literacy, English Literacy, Occupational Safety and Health, Quality tools, Communication Skills, Entrepreneurship Skills, Environment Education and Labour Welfare legislation.

An overview of apprenticeship training scheme

Background

Development of human resource is crucial for the industrial development of any nation. Up-gradation of skills is an important component of Human Resource Development. Training imparted in institutions alone is not sufficient for acquisition of skills and needs to be supplemented by training at the workplace. The Apprentices. Act, 1961 was enacted with the prime objective to utilize fully the facilities available in industry for imparting practical training with a view to meeting the requirements of skilled manpower for industry. Initially, the Act covered the apprenticeship training for the trade Apprentices and subsequently amended in 1973, 1986 and 2014 to bring the Graduates, Technician, Technician (Vocational) and Optional Trade Apprentices respectively under its purview.

Objectives

Apprentices Act, 1961 was enacted with the following objectives:-

- To regulate the programme of training of apprentices in the industry so as to conform to the syllabi, period of training etc. as laid down by the Central Apprenticeship Council;
- To utilise fully the facilities available in industry for imparting practical training with a view to meeting the requirements of skilled manpower for industry.

Monitoring of the implementation of the act

- Directorate General of Training under Ministry of skill Development and Entrepreneurship monitors the implementation of the Apprentices Act in respect of Trade Apprentices in the Central Government Undertakings & Departments and establishments operating business 4 or more states through six Regional Directorates of Apprenticeship Training (RDAT) located at Chennai, Faridabad, Hyderabad, Kanpur, Kolkata, & Mumbai.
- State Apprenticeship Advisers are responsible for implementation of the Act in respect of Trade Apprentices in State Government undertakings/ departments and private establishments.
- Department of Education in the Ministry of Human Resource Development is responsible for monitoring the implementation of the act in respect of Graduate, Technician & Technician (vocational) Apprentices. This monitoring is done through four Boards of Apprenticeship Training (BOAT) located at Chennai, Kanpur, Kolkata and Mumbai.

Central Apprenticeship Council

- It is an apex statutory body. It is tripartite by constitution with members from Government both Central and States/UTs, Employers etc.
- It advises the Government on laying down of policies and prescribing norms & standards in respect of apprenticeship training.

Fields of apprenticeship training

Apprenticeship training can be provided to apprentices both in designated and optional trades.

- **Designated trade:** Designated trade means any trade or occupation as notified by the Government.
- **Optional trade:** Optional trade means any trade or occupation decided by an employer.

Categories of apprentices

There are five categories of apprentices:

- Trade apprentices
- Graduate apprentices
- Technician apprentices
- Technician (Vocational) apprentices
- Optional trade apprentices

Coverage

- It is obligatory on the part of employers having manpower strength 40 or more and having requisite training infrastructure as laid down in the Act, to engage apprentices.
- Employer shall engage of apprentices in a band of 2.5% to 10% of total manpower strength of the establishments including contractual staff.
- The total engagements of apprentices in the band with of 2.5 % to 10% include all categories of apprentices engaged by establishment.
- The establishments/Employers can decide the categories of apprentices and trade (s) in which the apprentices to be engaged depending upon the facility available with them for imparting on-the-job training/ practical training at his workplace.

Stipend

The minimum rate of stipend per month payable to trade apprentices is as follows:

- The expenditure on stipend for trade apprentices is borne by the employers.

Stipend (year wise)	
Year	**Minimum Rate of stipend**
First Year	70% of minimum wage of semi-skilled workers notified by the respective State or Union territory.
Second year	80% of minimum wage of semi-skilled workers notified by the respective State or Union territory.
Third & Fourth year	90% of minimum wage of semi-skilled workers notified by the respective State or Union territory.

- The rates of stipend for Graduate, Technician & (Vocational) apprentices are Rs. 4984 p.m., Rs. 3542 p.m., and Rs. 2758 p.m. respectively. (with effect from 19th December -2014
- Expenditure on Stipend for the categories of Graduate, Technician & Technician (Vocational) apprentices is shared equally between the employer and the Central Government.

Training of Trade Apprentices

- Minimum age is 14 years.
- Qualifications vary from Class VIII pass to XII class pass (10+2) system.
- Period of training varies from one year & two years.
- Training comprises Basic Training and practical Training followed by Related Instructions as per prescribed syllabus for each trade.
- 261 trades in 39 trade groups have been designated.
- Numbers of seats for apprentices are calculated in the band of 2.5% to 10% of the total strength of the workers.
- Every apprentice and employer has to enter into a contract of apprenticeship training, which is registered by the Apprenticeship Advisers.
- Employers and apprentices have to fulfill their obligations under the Act.

Testing and certification of Trade Apprentices

- All India trade tests (AITT) for trade apprentices are conducted by National Council of Vocational Training (NCVT) twice a year (October/November and April/ May).
- National Apprenticeship Certificates (NAC) are awarded to those who pass the AITT.
- NAC is recognized for employment under Govt./ Semi - Government departments/ organizations.

Skill competition of Trade Apprentices

- With a view to fostering healthy competition among apprentices as well as establishments, skill competition is organized at local, regional & All India levels.
- Skill competition is held for 15 trades namely; Fitter, Machinist, Turner, Welder (Gas & Electric), Electrician, Mechanic (Motor Vehicle), Tool & Die Maker (Die & Moulds), Tool and Die Maker (Press Tool, jigs & Fixture), Instrument Mechanic, Draughtsman (Mechanical), Mechanic Machine Tool Maintenance, Wireman, Mechanic (Diesel), Refrigeration & Air-Conditioning Mechanic and Electronics Mechanic.

Training of Graduate, Technician And Technician (Vocational Apprentices)

- 163 subject fields have been designated for the category of Graduate & Technician apprentices.
- 137 Subject fields have been designated for the category of Technician (Vocational) apprentices.
- Period of post qualification training for these categories is one year.
- Seats are located based on managerial/supervisory posts and training facilities.
- Training programme is prepared in joint consultation between Apprenticeship Adviser Establishment concerned.
- Certificates are awarded on completion of training by the Dept. of Education, Ministry of Human resource Development.

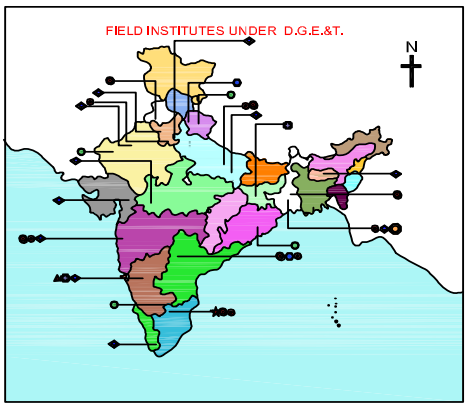
Craft Instructor Training Scheme (CITS)

- Training of craft instructors is the responsibility of Directorate General of Training (DGT), Ministry of skill Development and Entrepreneurship (Erstwhile Ministry of Labour & Employment, Directorate General of Employment and Training (DGE &T). The craft instructors' Training Scheme is operational since inception of the Craftsmen Training Scheme. The first craft instructors' Training Institute was established in 1948. Subsequently, 13 more institutes namely, Central Training Institute for Instructors (now called as National Skill training Institute (NSTI) at Ludhiana, Kanpur, Howrah, Mumbai, Hyderabad, Bangalore, Calicut, Bhubaneshwar, Jodhpur, Haldwani Dehradun and Jamshedpur were established by DGT.
- Objective of the Craft Instructor Training is to train Instructors in the techniques of transferring hands - on skills, in order to train semi - skilled / skilled manpower for industry. Structure of training programme is such that comprehensive training both in skill development and training methodology is imparted to the trainees.
- During year 2010 government also allowed setting up of the Instructor Training Institute by State/UT Governments, companies like sole propriety, private/ public limited registered under companies Act, societies and trusts registered as per Act, and promoters of SEZs. In order to maintain quality and standards of Instructor Training, NCVT has approved separate standards for infrastructure and course curriculum. The institutes meeting the standards would be affiliated with NCVT. These institutes are named as Institute for Training of Trainers (ITOT). On completion of the training trainees would be trade tested and awarded National Craft Instructor Certificate. Guidelines for setting up of ITOTs were issued in jan 2012.
- The NVTI at Noida and RVTI is at Mumbai, Bangalore, Trivandrum, Jaipur, Allahabad, Indore, Vadodara, Panipat, Kolkata, Tura, Shimla, Rajpura, Trichy, Agartala and Patna are also imparting Instructor Training Courses exclusively for women in various trades like Secretarial Practice (English), Secretarial practice (Hindi), Electronic Mechanic, Dress Making, Computer Aided Embroidery & Needle Work, Fashion Technology, Architectural Assistantship and Beauty Culture & Hair Dressing.
- Under the programme, Instructors from Government/ Private ITIs and Centers established by industries under the Apprentices Act are trained. Training in 24 Engineering and 10 Non-Engineering trades is being offered in these institutes. Second shift has been also started to increase the seating capacity under Crafts Instructor Training Programme. Total seating capacity in the above stated Institutes is over 13000.
- To make instructor training more effective, semester pattern of Craft Instructor Training in place of conventional one year training has been introduced in NSTIs and ITOTs, since 2014 session.

Training Institutes under DGT in India

The Central Training Institute is merged with Advance training Institutes in june 2017.

Fig 2



CTI-CENTRAL TRAINING INSTITUTE INSTRUCTORS (1)
ATI - ADVANCE TRAINING INSTITUTES (6)
RVTI - REGIONAL VOCATIONAL TRAININIG INSTITUTE (10)
RDAT - REGIONAL DIRECTORATE APPRENTICE SHIP TRAINING (6)
MITI -MODEL INDUSTRIAL TRAINING INSTITUTES (4)
FTI -FOREMAN TRAINING INSTITUTES (2)
CSTARI -CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE (1)
APEX - APEX Hi-TECH INSTITUTE (1)
AT-EPI -ADVANCE TRAINING INSTITUTES FOR ELECTRONICS AND PROCESS INSTRUMENTATION
NIMI - NATIONAL INSTRUCTIONAL MEDIA INTITUTE (1)
NVTI - NATIONAL VOCATIONAL TRAINING INSTITUTE (1)

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The institutes under DGT with different names like ATI, FTI, ATI, EPI, AHI, NVTI and RVTI are imparting training on skill based training but the skill ingredients are not reflected in the name of institute. In order to avoid confusion uniformity and reflect the "Skill" in name of the institute the Government Of India has changed the name as "National Skill Training Institute" with effect from April 2018.

Centre merges skill training bodies, forms new council

The Union Cabinet has approved the merger of the existing regulatory institutions in the skills space- NCVT and NSDA into the National Council for Vocational Education and Training (NCVET). With effect from (October 10,2018)

The primary functions of NCVET will include recognition and regulation of awarding bodies

Merging of skill training bodies

The Union Cabinet has approved the merger of the existing regulatory institutions in the skills space- National council for Vocational Training (NCVT) and the National Skill Development Agency (NSDA) into the National Council for Vocational Education and Training (NCVET). The new body will regulate the functioning of entities engaged in vocational education and training, both long-term and short-term and establish minimum standards for the functioning of such entities.

The primary functions of NCVET will include recognition and regulation of awarding bodies, assessment bodies and skill related information providers; approval of qualifications developed by awarding bodies and Sector Skill Councils (SSCs); indirect regulation of vocational training institutes through awarding bodies and assessment agencies; research and information dissemination and grievance redressal.

The Council would be headed by a chairperson and will have executive and non-executive members.

The merger will lead to improvement in quality and market relevance of skill development programs lending credibility to vocational education and training encouraging greater private investment and employer participation in the skills space.

Schemes implemented by DGT

- Craftsmen Training Scheme (CTS)
- Apprenticeship Training Schemes (ATS)
- Women Occupational Training Scheme (WOT)
- Craft Instructor Training Scheme (CITS)
- Short term courses

Women training

Overview

Women's Vocational Training Programme under Ministry of Skill Development & Entrepreneurship takes care of providing skill training to women in the country and aims at stimulating employment opportunities for social development, economic growth and empowerment of women.

NSTIs (erstwhile NVTI/RVTIs) for women are set up mainly to produce women instructors. These trained instructors provide training to students through a network of Industrial Training Institutes (ITIs) all over the country.

NSTIs for women have been set up keeping in mind the need of women belonging to lower income strata group and weaker sections of the society. Many practices like raw material, merit-cum-means stipend/scholarship, hostel facilities etc. have been adopted to attract these girls and women for skill training with effect from October 2018.

The NSTIs for women organize NCVT approved skill training programmes under Craftsmen Training Scheme (CTS) and Craft Instructors' Training Scheme (CITS) in trades such as Electronics Mechanic, Architectural Draughtsmanship, Computer Operator and Programming Assistant, Secretarial Practice, Cosmetology, Dress Making, Catering & Hospitality, Interior Decoration & Designing etc.

Vocational Training exclusively to women were earlier provided through 11 National Skill Training Institutes (NSTIs) for women, one each at Noida, Mumbai, Bengaluru, Thiruvananthapuram, Panipat, Kolkata, Tura, Allahabad, Indore, Vadodara & Jaipur.

To enhance the skill training facilities for women in India, establishment of 8 New NSTIs (erstwhile RVTIs) have been approved by Govt. of India in the states where there were no existing NSTIs for women. Out of these 8 NSTIs (W), 07 NSTIs (W) have started functioning in the states of Punjab, Himachal Pradesh, Bihar, Tripura, Tamil Nadu, Telangana and Goa.

A total of 4664 regular seats have been sanctioned in NSTIs for women in 2017-18 in various training courses under CTS and CITS. Since inception 1,45,000 women trainees have been trained in these institutes.

Short term courses

Short term courses are conducted in to impart training and updating the skills of Engineers / Supervisors / Technicians / Executives of Industrial personnel & faculties of educational institutions through courses of short duration conducted in modules and tailor made courses as per the specific needs of their industries / Govt Estt. / PSUs / Technical Institutions. The courses are conducted for higher skill upgradation through intensive skill oriented training by using the latest version of equipment and machinery used in industry.

Principles of Teaching — Theory 1.2
Broad Vocational Scenario & Traits of Instructor

Roles & Responsibilities of an Instructor

Objectives: At the end of this lesson you shall be able to
- **distinguish the terms teacher, trainer and Instructor**
- **state the role of an Instructor**
- **explain the responsibilities of an Instructor.**

Teacher : A person who works to imparts knowledge in an official institution of formal education being responsible for the overall learning progress of the learners undertaken by him/her.

It would include those teachers in preschools, schools, Colleges and Universities, etc.

Trainer : A person who guides and supports someone in acquiring new physical skills by participating in the physical activities and demonstrating the ways to properly achieve the desired goals in a systematic manner.

A gym trainer, a sports trainer, a dance trainer, etc, are a few examples.

Instructor : A person who provides live interactions to the learners during a learning activity which is a part of the program.

An instructor cannot work without a teacher. Either the instructor can act as a teacher to teach the basic pre-requisites of that activity or there has to be a separate teacher to do that, e.g. in the case of a flight instructor.

Role of an Instructor

Instructor has the following important roles to play in a training institute.

As an Organizer

- **Organize a training programme:** Based on the syllabus provided, the Instructor has to organize the entire training programme by analyzing it further.
- **Prepare training material:** Before commencing the course the Instructor has to prepare various kinds of teaching aids like lesson plan, information sheet, training aids, demonstration plan, etc. This requires a lot of preparation.
- **Conduct a training programme:** The main job of a vocational instructor is to conduct training programme, which includes planning, preparation, presentation, testing and evaluation.
- **Workshop demonstration:** For acquiring particular skill there will be certain steps which are to be followed. For example, stitching of a garment, an instructor has to draw the style feature on the chalkboard. Then Instructor has to do the drafting of the same either on the board or on a paper. The paper pattern is marked on the cloth & then cutting is performed. The cut component will be stitched with the help of sewing machine. By attending the demonstration the trainees will learn the entire cutting & stitching procedure.
- **Attitude Formation:** An instructor must motivate and guide to improve the attitude of the trainees towards the training without which they will not be able to acquire the skill which has been taught.
- **Evaluation & Grading:** No training is completed if it is not properly evaluated & graded. The extent of instructional objectives achieved will be known through testing and evaluation. Grading will help the learners to perform better than the previous test. Instructor's efficiency in teaching also will be known by means of evaluation and grading.

As a Manager

- **Maintenance of tools & equipments:** For conducting training various kinds of tools & equipments are required. An instructor has to procure all tools and equipments as per the syllabus & maintain them properly.
- **Supervise the practical training:** During the practical exercise it is very much necessary for the instructor to be present with the trainee. Just by giving the theoritical knowledge to the trainees and then asking them to do practical work is not enough. But the instructor must be physically present to supervise and guide the trainees.
- **Liaison with the institution:** The instructor is the link between administration & the trainees. So Instructor has to inform the administration about the training activity of the trade. At the same time Instructor must also keep the student informed about the instructions issued by the administration.

As a Student

Vocational instructor should always update their knowledge, upgrade their skill with new techniques, depending upon the changes in latest technology.

Responsibilities of an instructor

The various responsibilities towards teaching-learning processes are as follows:

- Responsibilities towards the learners/trainees
- Responsibilities towards the administration
- Responsibilities towards the industries
- Responsibilities towards the society and nation
- Responsibilities towards himself/herself
- Responsibilities towards the profession
- Responsibilities towards the parents

Responsibility towards the learners trainees:

Trainees comes to the institute for training and his aim is to become a competent craftsman. In order to fulfil the aim of trainees the trainer.

- must guide and instruct them properly and complete the training programme as per the schedule.
- evaluate the trainees performance and bring the trainee who are below average level to the standard required.
- develop attitudes and safe working habits of trainees to use the raw materials economically which are given for learning purpose.
- must cultivate good habits like workshop safety, punctuality, time management, etc.

Responsibility towards the administration:

As an Instructor he is the link between the trainees and administration , he should be

- loyal and sincere towards the administration.
- interpreter and communicator of working policies to the trainees and support to the administration.
- instructor should not waste the material at his disposal.
- maintain discipline and also report the happening of any incident to the administration.

Responsibility towards the industries:

As the industrial establishments are the beneficiaries, the instructor should:

- suggest changes in training programme for the day to day development
- keep himself updated about the latest technology, equipments, materials in the industries.
- keep liaison with industries by field visits and placements, etc.

Responsibility towards the society and nation:

Teaching is more than providing skills and knowledge in a particular trade. Such training should also be to develop the society and the benefit of the nation as a whole. For this the instructor can influence the learners as follows:

- Develop a sense of responsibility towards the society.
- Make them realize that when they get something from the society they also have to contribute to the society.
- Building a society is ultimately building a nation. The trainees should develop this sense of building a nation.

Responsibility towards herself/himself:

The instructor's job is a noble one and thrusts him/her with a lot of responsibilities in the course of performing the job.

- He should be sincere and honest towards the profession.
- Take maximum efforts to develop his personality.
- Cultivate pleasant manners.
- Maintain the dignity of the profession.
- Keeping good health and update the knowledge.
- Take interest in teaching.

Responsibility towards the profession:

The instructor has to constantly update his knowledge and skill to improve the process of teaching and learning. Improving the process of teaching-learning would mean the following innovative strategies and techniques that would cause significant improvement in the training programmes.

He can do this by:

- adopting positive attitude towards innovative methods.
- understanding the basics and application of outcome of research findings,
- following better and tested new strategies and techniques,
- utilisation of self study materials for self improvement, and
- identification of various principles and factors that aid productive learning and developing course materials and use them carefully.

Responsibility towards the Parents:

As an he should develop proper liasion with trainees and their parents and should has act as a link between them. Therefore, he should

- keep them informed about the progress and shortcomings of the trainees.
- guide the parents in deciding the future career of the trainees.

Principles of Teaching — Theory 1.3
Broad Vocational Scenario & Traits of Instructor

Essential traits of a good Instructor

Objectives: At the end of this lesson you shall be able to
- **state the prerequisites of an instructor**
- **explain the personality of good instructor**
- **brief the qualities of an instructor**
- **list the traits of a good instructor.**

Prerequisites of an instructor

The requisites and prerequisites of an instructor include the ability and qualities of an instructor. Communication skill, subject knowledge, experience are few of those qualities.

Qualification

The instructor must fulfil certain qualifications required for the post. The qualifications are classified into two types. They are;

- Essential Qualification
- Desirable Qualification.

Without the necessary above qualifications one cannot be considered for the post of instructor.

Personality traits of good instructor

Habit and Personality

Habits are a voluntary action repeated very often by an individual. Good habits can be developed by way of self-thinking & self-motivation, etc. After forming the habits, firm determination, continuity, practice, encouragement, etc. can develope habits further.

Personality is the influence of one's mental, physical, and emotional interaction with others. It can also be said that personality refers to physical, mental, moral and social values of a person.

Types of personalities

There are two types of personalities:

- Introvert
- Extrovert

Introvert: Persons who are reserved, who do not like to mix with others, who like to work alone, who are better in writing than speaking, fond of books, magazines, who do not like self-praise, etc. belong to Introverted personality group.

Extrovert: Those who like to mix freely with people, fluently speaking, friendly not easily embarrassed or harmed are known as extrovert personality.

The people who have both these qualities are called **Ambiverted Personality.**

Factors influence personality development are:

- **Physical** : Appearance, voice, speech, tone.
- **Mental** : Intelligence, wisdom, memory, thinking, and reasoning.
- **Environmental** : Family, relatives, neighbours, society.
- **Emotional** : Cheerful, nervous, temper, anxiety
- **Gender/Sex** : Men or women
- **Cultural** : Religion, community.

Personality development

Personality is defined as the enduring personal characteristics of individuals. Personality development is the development of the organised pattern of behaviours and attitudes that makes a person distinctive. Personality development occurs by ongoing interaction of temperament, character and environment.

Qualities of an instructor

Qualities of an instructor can be classified as

- Physical Quality
- Mental Quality
- Moral Quality and
- Personal Quality

Physical Quality

- **Good Health:** An instructor can be prompt, regular, enthusiastic, only if he keeps good health.
- **Dress and Appearance:** An instructor's dress must always be simple and neat. Instructor must avoid attractive dresses which may distract the attention of the learners.

- **Voice:** An instructor's voice must be clear and audible. It must not be harsh and monotonous.
- **Language and Speech:** The language of an instructor should be simple and clear, easily understandable. It should not be ornamental and grammatically incorrect. Instructor should develop himself to be a good orator.

Mental Quality

- Knowledge of the subject
- Knowledge of principles and method of teaching.
- Knowledge of psychology as psychological factor, helps in learning.

Moral Quality

- **Justice and impartiality:** An instructor must be impartial in handling and dealing with their trainees.
- **Self control and will power:** Instructor must have good self-control and will power to face the trainees.
- **Sympathy and perseverance:** Instructor should have sympathy, kindness and immense patience.

Personal Quality

- **Leadership:** Instructor must have leadership qualities to guide properly and give instruction to the trainees.
- **Class control:** Controlling the class is also an important factor without which discipline cannot be maintained; when discipline is not maintained we cannot expect desired learning outcome.
- **Class manners:** His behaviours towards trainees should be very polite and gentle the instructor must avoid addressing them rudely and retrain from insulting them badly.
- **Good habits:** An instructor must have good habits like punctuality, regularity and honesty, sincerity.

Traits of good instructors

As the teaching is a noble task, an instructor must require the knowledge and skill technique of teaching. Following are the most important factors to be performed by an instructor.

- Has to make the course interesting.
- Has to possess sense of promoting the knowledge and skill.
- Has to encourage trainees participation.
- Admire the interest of the trainees.
- Should be neatly dressed.
- Should be socially flexible.
- Should provide a variety of learning experiences.
- Has a friendly personality.
- Should have sound knowledge of the subject.
- Has a posed (balanced) and business like attitude.
- Shows a great deal of enthusiasm.
- Uses many illustrations
- Has pleasant voice.
- Readily assumes responsibility.
- Has a moderates honorable view.
- Uses knowledge skill for transfer and application.
- Reasonably strict and maintain discipline.
- Has the teaching material well organised.
- Should be fair in evaluation.
- Has to maintain proper training records.
- Should be punctual.
- Should use tools, materials, and equipments economically.

Model Questions

Theory 1.3

12 What is the name for a voluntary action repeated very often by an individual?

A Habit B Personality

C Physical activity D Mental activity

13 What is the name of the quality that an instructor can be prompt, regular enthusiastic only if he keeps good health?

A Physical quality B Mental quality

C Moral quality D Personal quality

14 What is the name of the quality that an instructor must be impartial in handling and dealing with trainees?

A Physical quality B Mental quality

C Moral quality D Personal quality

15 The statement of “The instructor has to make course interesting” covered under which title?

A Personality B Physical quality

C Personal quality D Traits of Instructor

Principles of Teaching — Theory 1.4
Broad Vocational Scenario & Traits of Instructor

Characteristics of good Instruction and common defects in Instruction

Objectives: At the end of this lesson you shall be able to
- **explain the characteristics of good instruction**
- **state the elements of vocational training**
- **brief the common defects in instructor.**

Characteristics of good instruction:

Characteristics of effective teaching are the factors which help trainees to learn. Effective teaching can mean different things in different environments. An instructor must prepare to teach in terms of interest, motivation, and ability. Some of the elements which help to plan and process a training programme in a complete and successful way are as follows. These elements are useful for effective teaching-learning process.

- **Need Assessment:** Training programme will be planned and organized only if a particular trade has a demand in the industry or by the people of a particular area. Based on the need, positive learning atmosphere must be made.
- **Planning:** Before teaching, systematic planning must be made based on available resources, raw materials, necessary time for teaching, objectives, methods, etc.
- **Preparation:** Preparation includes both instructor preparation as well as the learner's preparation. The duration of quality time of teaching depends on clearly stated objectives. If the objectives are not clear, the teaching time may exceed more than the allotted time. The learner's participation can be invited by asking introductory questions, and thought provoking questions. Questions may be asked to link the learner's previous knowledge to the present topic.
- **Method:** Suitable method of imparting training must be selected. For theory- lecture, lesson plan methods and for practical demonstration methods may be adopted.
- **Media:** Suitable media and other teaching aids utilized for the purpose of teaching must be selected well in advance. If media is available readily it is good, if not it has to be prepared by the Instructor.
- **Motivation:** Motivation is creating willingness. An instructor must motivate the learners by creating interest and willingness towards learning by explaining the purpose of learning with suitable examples.
- **Presentation:** Presentation is very important characteristic of effective teaching. Presenting the information should be in sequence, simple to complex to be followed. As per the objectives, the lesson must be presented. Lesson must be taught by associating the present information with the subject or lesson already taught and the learners' previous knowledge. The more the stimulus, the more will be the response. Stimulate the learners by giving examples, showing models, and other visual aids. Use visual aids in the appropriate time.
- **Questioning:** Questioning is not only at the end of the teaching process, but also adopted at all the stages. Ask questions time to time. Through questioning and interaction, an instructor will understand the trainees' response and can get satisfaction that the learners are grasping what is being taught.
- **Evaluation:** After teaching, evaluation must be done in order to measure to what extent the instructional objectives are achieved. The performance of the trainees, the success of the training will be known by evaluation of their learning.
- **Feedback:** Feedback is essential part of teaching-learning activity. The purpose of getting feedback is to help the learners to solve the unsolved problems. Feedback must be received immediately after presenting the lesson. It will also help the trainer for self evaluation.

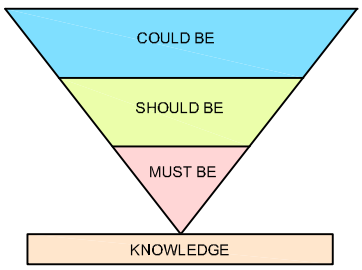
Elements of vocational training:

Important elements of vocational training are:

- Knowledge
- Skill
- Attitude and Productivity.

- **Knowledge:** Knowledge is gaining the information. For acquiring skill, one must have thorough knowledge about the skill. Knowledge is classified in to three types. (Fig 1)

Fig 1



1 **Must know knowledge:** This is essential information or knowledge that is very much necessary to perform the skill, without this it is quite impossible to initiate the work.

2 **Should know knowledge:** This is additional information or knowledge that will enable the trainees to do their work in a better way.

3 **Could know knowledge:** This is some more information but it is required for updating of the individuals. It will also improve the efficiency and productivity.

- **Skill:** Skill is an ability or capacity or expertness to perform a particular job. For performing any operation one must have skill, which is required to be performed in a systematic manner. For example, before stitching of a garment, the cloth should be cut first as per the measurements and then stitched. The skill, which the trainer has, must be transferred to the trainees. Vocational training helps an individual to acquire job related skill. Basic skill comprises of the following factors:

  - Accuracy
  - Speed
  - Workmanship
  - Concentration
  - Method
  - Economy
  - Proper attitude
  - Technique and
  - Coordination.

- **Attitude:** It is a way of thinking, doing, and behaving. In educational term 'attitude' is defined as a learner tendency to evaluate things in proper way. Cultivating of positive attitude towards learning among the trainees is one of the important elements of vocational training. Unless the trainees are ready to learn they tend to lack interest. This state of mind is possible only when the trainees have qualities like initiative, enthusiasm, coordination, punctuality, self-control, willpower, judgment, promptness, speed, understanding, etc. These good qualities of an individual are part of the Attitude. For performing any kind of work, positive attitude towards the work is important.

- **Productivity:** Productivity is the tendency of making products. It is the amount of output per unit of input by means of man, machine, and materials. After training in vocational skills, a trainee must be able to do job in their related trade to get productivity. Higher productivity can be achieved only with the help of the 'skill and will'.

Common defects in instruction

The instructor must avoid the following common deficiencies

- Defects in the personality.
- Inadequate preparation.
- Improper method of presentation.
- Improper evaluation.
- Inadequate human relationship.

Defects in the personality

- Instructors unnecessary action while teaching.
- Instructor gets nervous.
- Bad mannerisms.
- Over confidence.
- Lack of interest/ambition.
- Physical defect/lack of mental alertness.
- Lack of manipulation ability.

Inadequate preparation

- The syllabus may not be analysed properly.
- Not understanding the main objectives of the course.
- Improper planning in preparation and source use of training aids.
- Lack of knowledge in the subject.
- Irrelevant written instruction materials.
- Unable to organize the method of learner involvement.

Improper method of presentation

- Wrong presentation method, starting subject without any introduction motivation etc.
- Wrong method of instruction, the dictation method is the worst for vocational training.
- Not adopting the proper questioning technic.
- Improper use of teaching/training aids.
- Voice such as shouting, murmuring while presenting the subject.
- Irrelevant assignment.

Improper evaluation

- Improper method of evaluation procedure.
- Unfairness in evaluation.
- Inaccuracy in evaluation.
- Partiality.

Inadequate human relationship

- Failure to gauge the standard of the trainees.
- Failure to measure their level of competency, grasping power etc.
- Failure to develop friendly atmosphere.

UNIT - II

PSYCOLOGY OF LEARNING

Learning Outcomes to be achieved from this unit:

- **Prepare the trainees for the class using the basics of Education Psychology**
- **Motivate the trainees for the required training.**

Principles of Teaching Psychology of Learning

Theory 2.1

Educational psychology and teaching

Objectives: At the end of this lesson you shall be able to
- **define psychology**
- **explain educational psychology**
- **explain the nature and scope of educational psychology**
- **list the advantages of educational psychology for a teacher/instructor**
- **define teaching**
- **list the steps for effective teaching**
- **explain the principles of teaching.**

Definition

Psychology may be defined as the scientific study of the human behaviour and mental process. The word psychology is derived from the Greek words 'psyche' means soul; 'logos' means science.

Thus, psychology is the branch of scientific study of human mind and how it influences behaviour consciously and unconsciously.

Educational psychology is nothing but one of the branches of applied psychology. In other words, educational psychology is a study of the experiences and behaviour of the learner in relation to educational and training environment.

From time to time psychologists have tried to define educational psychology in their own ways. Some of these definitions are given below:-

- Skinner defines it as : "Educational psychology is that branch of psychology which deals with teaching and learning."

- Crow and crow put it as : "Educational psychology describes and explains the learning experiences of an individual from birth through old age."

Nature of educational psychology

We can summarise the nature of educational psychology in the following way:-

- Educational psychology is an applied branch of the subject of psychology. By applying the principles and techniques of psychology it tries to study the behaviour and experiences of the learners.
- While psychology deals with the behaviour of all individuals in all walks of life, educational psychology limits its dealing with the behaviour of the learner/ trainee in relation to educational and training environment.
- It does not concern with 'what' and 'why' of education, it gives the necessary knowledge and skill (technical guidance) for giving education to the learners in a satisfactory way.
- It is not a normative science as it is not concerned with the values of education and does not concern itself with "what ought to be". It is an applied positive science.
- Educational psychology is not a perfect science. It has its own draw-backs. The human (as well as animal) behaviour is unpredictable. It is more variable and less reliable. Therefore, educational psychology, the applied behavioural science, cannot claim objectively, exactness and validity as claimed by natural sciences or even applied sciences like medicine and engineering etc.
- It employs scientific method and adopts scientific approach to study the behaviour of an individual in educational and training environment. Moreover the controlling of the factors and prediction of the behaviour on generalized results gives educational psychology a complete scientific base. Therefore, it is proper to call its nature as scientific.

Scope of educational psychology

Educational psychology deals with the behaviour of the learner in educational situations (only). Therefore, it becomes imperative that educational psychology should limit itself within the four walls of the teaching-learning process and educational and training environment. It must try to solve the problems evolving in actual teaching-learning situations and help the individuals involved in this process.

Let us judge what are the key factors in an educational process and list them one by one.

a The learner (trainee)

b The learning experiences

c The learning process

d Learning situations or environment

e The teacher/trainer

The subject matter of educational psychology, if it is at all necessary to draw its boundaries, revolves round these five pivots mentioned above

The learner

If we take first pivot, the learner we can find that educational psychology has the subject knitted around the learner. What this section of its subject matter it acquaints us with the need of knowing the learner and deals with the techniques of knowing him well.

The innate abilities and capacities of the individual, individual differences and their measurements, the overt, covert, conscious as well unconscious behaviour of the learner, the characteristics of growth and development at each stage beginning from childhood to adulthood.

The learning experiences

Once the task of educational philosophy to decide the aims and objectives of a piece of instruction at a particular stage is finished, the need of educational psychology is felt. At this juncture, educational psychology helps in deciding what learning experiences are desirable at what stage of the growth and development of the learner, so that these experiences can be acquired with a greater ease and satisfaction. In this area, educational psychology has the subject matter which deals with the knowledge and principles of psychology which facilitates the selection of the desirable learning experiences for the learner.

The learning process

Around this pivot educational psychology deals with the nature of learning and how it takes place and contains the topics such as laws, principles and theories of learning; recalling and forgetting, perceiving, concept formation, thinking and reasoning process, problem solving, transfer of training, ways and means of effective learning etc.

Learning situations or environment

Topics like classroom climate and group dynamics techniques and aids which facilitate learning, evaluation techniques and practices, guidance and counselling etc. which help in the smooth functioning of the teaching-learning process come under the jurisdiction of this pivot.

The teacher/trainer

Education psychology emphasizes the need of knowing the self for a teacher to play his role properly in the process of education. It discusses his conflicts, motivation, anxiety, adjustment, level of aspiration etc. It throws light on the essential personality traits, interests, aptitudes, the characteristics of effective teaching/training etc so as to inspire for becoming a successful teacher/trainer

Advantages for a teacher/trainer

The inclusion of educational psychology in a professional pre-preparation programmes for the teachers has a very wide utility. It helps them to grow properly in their profession.

To know the learner

Educational psychology equips the teacher/trainer for understanding the learner in the following different ways:-

- His interests, attitudes, aptitudes and the other acquired or innate capacities and abilities etc.
- The stage of development linked with his social, emotional, intellectual, physical and aesthetic needs.
- His level of aspiration
- His conscious and unconscious behaviour
- His motivational behaviour
- The aspect of his group behaviour
- His conflicts, desires and other aspects of his mental health.

To select and organise the subject-matter or learning experiences. After knowing the learner, when the stage is ready for educating the learner the following questions come in the way:-

What type of learning experiences or learning materials are to be provided?

How should we organise or grade the materials or learning experiences?

To answer these types of questions which along to the area of 'curriculum construction' one needs the knowledge of the characteristics of the learner at each stage of his/her development, the nature and laws of learning etc which come under the domain of educational psychology.

To suggest art and techniques of learning as well as teaching. After deciding about the learner and the learning material the next problem "how to teach" is also solved with the help of educational psychology. It explains the process of learning and suggests the means for effective and enduring learning. It reveals how to maintain interest in the learning process. It also suggests that not a single method or technique is suitable for all kinds of learners in all circumstances. A teacher/trainer should select a proper device or method according to the learning situations, he/she faces.

To arrange learning situations or environment. The study of the impact of the learning environment (including equipment facilities and teaching/training aid material etc.) on the teaching learning process equips the teacher/trainer for taking care of the appropriate learning situations or environment.

To acquaiant him with the mechanism of heredity and environment. The knowledge of the role played by heredity and environment in the process of growth and development of the child, is very essential for the teacher.

Helping in maintaining discipline. Knowledge of educational psychology helps the teacher/trainer to have a creative type of discipline as it acquaints him with the nature of the learner, his strength and weakness, his interests and aptitudes etc on the one hand and with art and techniques of teaching and learning on the other hand.

Rending guidance services. The knowledge of educational psychology helps the teacher/trainer in rendering guidance services to the learners. He/She is the person who can know the learner better, even more, than their parents. With the knowledge of educational psychology at his command, he/she is in touch with the methods of behavioural assessment and appraisal. He/she can better diagnose the abilities, interests and aptitudes of his learners and consequently have an idea of the direction and speed of their development. In this way with the help of educational psychology the teacher/trainer can show the right direction to his learners for their total development.

Helping in evaluation and assessment. After giving learning experiences to the learner, the behavioural changes occured in him are required to be examined and also in the beginning the potentialities are to be known. In educational psychology, as applied behavioural science, evaluation, measurement and appraisal find its place which make the teacher/trainer well equipped in the task of evaluation with proper professional skills.

Solving class room problems. There are innumerable problems like backwardness, absenteeism, bullying, cheating in the class room situations which are to be faced by a teacher/trainer. The study of the characteristics of the problem learner, the dynamics of the group, behavioural characteristics and adjustment etc. equip the teacher/trainer to solve the actual class-room problems.

Knowing about himself. Knowledge of educational psychology helps the teacher/trainer to know about themself. The own behaviour pattern personality characteristics, likes and dislikes, motivation, anxiety conflicts, adjustment etc are all revealed to him.

Teachers/trainers needs and problems are too many and have so many aspects. Educational psychology being a science and technology of education helps the teacher/trainer in all the phases of teaching and learning whether informal or formal, curricular or co-curricular. It does not only equip for the class-room instruction but also for the other duties assigned like construction of time-table organisation of co-curricular activities, to seek parental co-operation etc.

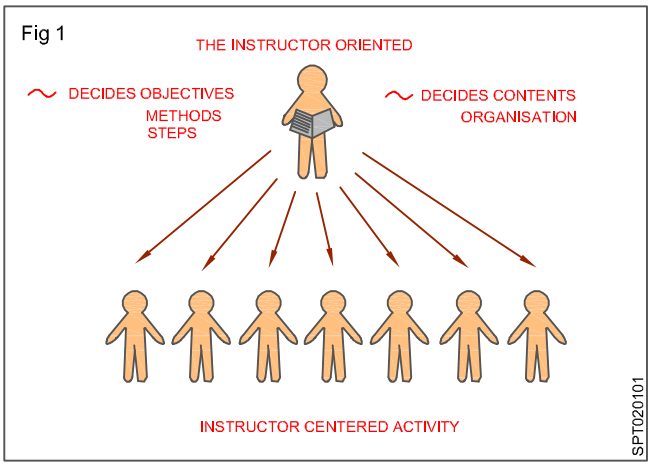
In this regard we can see that educational psychology is a subject which is very essential for the proper professional growth of the teachers and that is why it is an indispensable subject in the teacher/trainer training programmes of all stages.

Teaching/training

"Teaching/training is an instructional activity of delivering a particular skill or subject or something that someone tells you to do. It is aimed at bringing about meaningful learning through a method that is morally and pedagogically acceptable. It involves a teacher/trainers, a learner, content in the form of knowledge, facts, information and skill to be imparted. Teaching is considered as deliberate actions undertaken with the intention of facilitating learning".

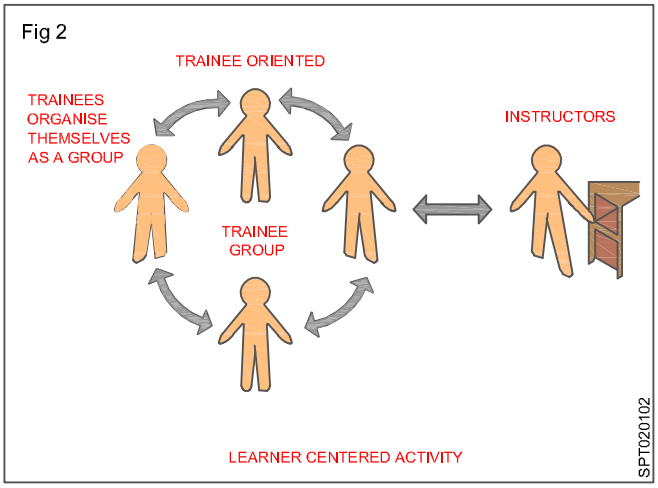
There are fundamentally two ways of understanding teaching/training. The first view is teaching/training as an instructor -centered activity (Fig 1) in which knowledge is transmitted from someone who has acquired that knowledge to novice learners.

Fig 1



The second view is teaching/training as a learner- centred activity (Fig 2) in which the instructor ensures that learning is made possible for novice learners and supports, guides, and encourages them in their active and independent creation of new knowledge and skills.

Fig 2



Teaching/training skills

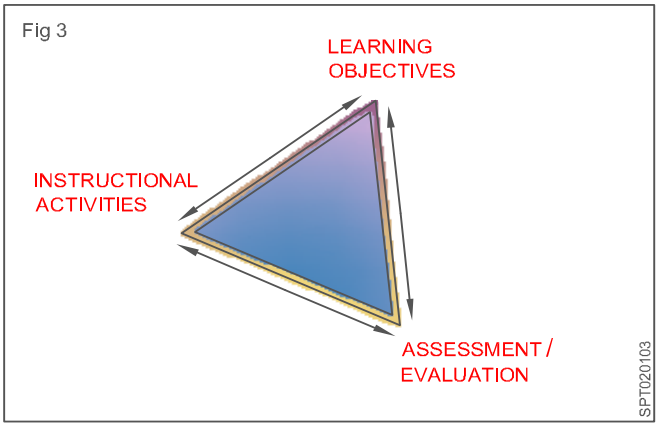
Teaching/training is a complex multifacted activity, often requiring an instructor to juggle multiple tasks and goals simultaneously and flexibly. The following set of principles can make teaching both more effective and efficient by helping us create the conditions support trainee learning. While implementing these principles it requires a commitment in time and effort, it often saves time and energy later on.

Effective teaching involves acquiring relevant knowledge about trainees and using that knowledge to inform our course design and classroom teaching/ training.

When we teach/train, we do not just teach the content, we teach learners the content. A variety of learners characteristics can affect learning. For example, learners cultural and generational backgrounds influence how they see the world; disciplinary backgrounds lead learners to approach problems in different ways; and learners prior knowledge (both accurate and inaccurate aspects) shapes new learning.

Effective teaching involves aligning the three major components of instruction: learning objectives, assessments, and instructional activities.

Fig 3



Teaching shall be more effective if learner learning is enhanced when (a) we, as instructors, articulate a clear set of learning objectives (i.e., the knowledge and skills that we expect learners to demonstrate by the end of a course); (b) the instructional activities (e.g., case studies, labs, discussions, readings) support these learning objectives by providing goal-oriented practice; and (c) the assessments (e.g., tests, papers, problem sets, performances) provide opportunities for learners to demonstrate and practice the knowledge and skills articulated in the objectives, and for instructors to offer targeted feedback that can guide further learning.

Effective teaching involves articulating explicit expectations regarding learning objectives and policies.

Trainer being clear about our expectations and communicating them explicitly helps learners learn more and perform better. Articulating our learning objectives (i.e., the knowledge and skills that we expect learners to demonstrate by the end of a course) gives learners a clear target to aim for and enables them to monitor their progress along the way.

Effective teaching involves prioritizing the knowledge and skills we choose to focus on.

Don't try to do too much in a single course. Too many topics work against learner learning, so it is necessary for us to make decisions – sometimes difficult ones – about what we will and will not include in a course. This involves (a) recognizing the parameters of the course (e.g., class size, learner's backgrounds and experiences, course position in the curriculum sequence, number of course units), (b) setting our priorities for learner learning, and (c) determining a set of objectives that can be reasonably accomplished.

Effective teaching involves recognizing and overcoming our expert blind spots.

As experts, we tend to access and apply knowledge automatically and unconsciously (e.g., make connections, draw on relevant bodies of knowledge, and choose appropriate strategies) and so we often skip or combine critical steps when we teach. Learners on the other hand, don't yet have sufficient background and experience to make these leaps and can become confused, draw incorrect conclusions, or fail to develop important skills. They need instructors to break tasks into component steps, explain connections explicitly, and model processes in detail. Though it is difficult for experts to do this, we need to identify and explicitly communicate to learners the knowledge and skills we take for granted, so that learners can see expert thinking in action and practice applying it themselves.

Effective teaching involves adopting appropriate teaching roles to support our learning goals.

We can take on a variety of roles in our teaching (e.g., synthesizer, moderator, challenger, commentator). These roles should be chosen in service of the learning objectives and in support of the instructional activities.

Effective teaching involves progressively refining our courses based on reflection and feedback.

Teaching requires adapting. We need to continually reflect on our teaching and be ready to make changes when appropriate. Knowing what and how to change requires us to examine relevant information on our own teaching effectiveness. We might modify the learning objectives, content, structure, or format of a course, or otherwise adjust our teaching.

Principles of Teaching

They are closely related to expression of principle or rule of conduct. In simple words teaching method are based on two types of principles: General principles and psychological principles.

1 **Principle of Motivation:** It creates curiosity among learners to learn new things.

2 **Principle of Activity (learning by doing):** Froebel's Kindergarten (KG) system is based on this principle. It includes both physical and mental activities. For example, learners are asked to make charts and models.

3 **Principle of Interest:** By generating genuine interest among the learner's community, the effectiveness of the teaching-learning process can be increased.

4 **Principle of linking with life:** Life is a continuous experience, and learning linked with life can be more enduring.

5 **Principle of Definite aim:** This is important for optimum utilization of teaching resources and making learning more focused.

6 **Principle of Recognizing individual differences:** Every learners is unique in terms of intelligence, attitude, abilities and potentialities, socio-economic background. The teaching method should be devised in such a manner to make all the learners to avail equal opportunities in life.

7 **Principle of Selection**: The horizon of knowledge is expanding each day. The teacher should be able to pick contents that can be more relevant and update to the learner's objectives.

8 **Principle of Planning:** Every teacher has certain time-bound objectives, and hence, teaching should be systematic to make optimum use of resources within the time limit.

9 **Principle of Division:** To make learning easier, the subject matter should be divided into units, and there should be links between the units.

10 **Principle of Revision:** To make learning enduring, the acquired knowledge should be revised immediately and repeatedly.

11 **Principle of Certain and Recreation:** This Principle is a must to make classroom environment humorous and creative.

12 **Principle of Democratic dealing:** It entails learners in planning and executing different activities; It helps in developing self-confidence and self-respect among the learner's.

Model Questions

Theory 2.1

1 What is psychology?

A Scientific study of the human mind

B It is a Art of Astrology

C It is a change in behaviours

D It is a branch of philosophy

2 What is meant by educational psychology?

A It is one of the branches of applied psychology

B It is science of education

C It is a branch of philosophy

D Scientific study of the human mind

4 Which principle creates curiosity among the learners?

A Principle of Interest B Principle of Activity

C Principle of Motivation D Principle of Planning

3 What is the name of the domine under which learner's development nature and laws of learning comes?

A Psychology

B Philosophy

C Techniques of learning

D Educational psychology

5 What is the name that every teacher has certain time bound objectives, and hence, teaching should be systematic to make optimum use of resources with in the time limit?

A Principle of Motivation

B Principle of Planning

C Principle of Interest

D Principle of definite aim

Principles of learning & teaching

Objectives: At the end of this lesson you shall be able to

- **define learning**
- **classify the essential principles of learning**
- **describe the types of learning**
- **list the factors affecting learning process.**

Learning is a psychological process of acquiring new or modifying existing knowledge, behaviours, skills, values or preferences which leads to a change in behaviour of an individual. There are certain basic psychological factors and principles related to learning which every instructor should understand and be able to apply in his presentation. The learning does not take place unless the learner is ready and instructor is willing to teach. Therefore, this change will be due to certain conditions of learning, like motivation, stimulus, response, etc. All these process of motivation, stimulation and response are connected with psychological reasoning. This reasoning is known as principles of learning. For making the students to learn better, it is important for an instructor to know the principles of learning, which influence in better learning.

The following are some of the principles of learning that the instructor should know and make use of teaching.

Learning results from stimulation through human senses

Learning is explained as the things, learner does as responses to stimuli. Real learning is the change which takes place in a learner, as a result of his mental and physical responses or reactions to stimuli caused in the mind through neuro muscular activity of the senses. As a result of the contacts with ideas and things a learner responds, which leads to the learning of new knowledge, improvement in certain habits, changes in learner attitudes or points of view.

Hence, it is the instructor's responsibility to provide the best learning situations and guide learners in acquiring skill in handling tools, equipment, machines and materials etc. When demonstrated a skill, he/she should be explained the purpose and the sequence of operation steps so that the rate of learning is enhanced.

Learning requires activity

"We learn to do by doing" defines that a principle which must be put into practice by every instructor. In order to develop manipulative skills the instructor make the learner/trainee physical work. Such physical work implies for the application of related information. It also keeps the learner active in mentally and physically and which leads to develop the habits of basic to skill development.

Learning is based on past experience

"Learning starts with what the learner knows but not with the teacher know or starts".

The said expression states that is true in all learning situations. What the learner knows is the foundation for what he intend to know. Suppose an instructor, presenting about the resistance in wires, he compares the flow of electrical current to the resistances and explain by comparing the flow of water from sizes of pipe (diameter of pipe). This similarity interacts with learner and be able to understand quickly. Hence, new learnings are learnt by learners by means of re-collecting or comparison with the past experience, that the learner knows.

Interest is essential to effective learning and makes learners ready to learn

Interest is inner feeling which causes people to direct their attention to do certain thing. Interest leads to attention. Attention with interest makes the learner to concentrate. Concentration with purpose provide feelings. The experiences obtained lead to reach highest point (culminate) in real learning. The instructor should motivate the learners in order to create interest by providing the conditions under which learning is purposeful, quick and effective.

Early success increase chance for effective learning

In the early stages of training program the instructor should see that the learners/trainees work under is direct supervision and guidance, which helps to learner to develop interest in the work what has been allotted to him. It is the responsibility of the instructor that the work what the learner does, should result in success. When there is satisfaction further learning is possible. In case of normal and average learners the achievement such obtained will lead to great pleasure and stimulates or motivates to greater activity.

Knowledge of the purpose, use and application of thing to be taught makes learning more effective

The learner has right to know, the need of the learning. It is the responsibility of the instructor to convince the learner, the purpose of learning in which he is interested.

The instructor should correlate the theoretical informations to the practical applications of the jobs and the learner should learn and be able to explain composite knowledge of related informations which makes him a good craftsman.

Continuous evaluation is essential to effective learning

Self evaluation of learner's efforts is essential to progress. The learner must continuously compare his work with some standard accomplished learner if he/she is to improve. It is the instructor to keep goals to the high standards of achievement. The instructor should help the trainees to compare their effort with the known and to recognise quality. Even for critics evaluation of their performance improves their work.

Recognition and credit provide strong incentive for learning

Trainees/Learners ambition expect credit for their performance of work, when it is done well. Even though well performance may be the responsibility of the learner, awarding credit to their work, which causes for stimuli and greater activity among the trainees.

The most effective learning results when mital learning is followed immediately by application

The learner/trainee forgets very quickly the large part of learning when he/she has not given a chance of applying and not using constantly. The learner should make effort to use of newly learnt information, for remembrance and recall. Subsequent to the demonstration the instructor should provide opportunities to the learners to practice the skill which has been demonstrated, under the very careful supervision of the instructor.

Repetition helps development of skill

More number of repetition leads to develop habits. The trainees to develop the speed, accuracy. The accuracy must be emphasized in the beginning of training period. The acquisition of speed may be emphasized when trainee achieve accuracy and correct work habits. But for good results and development of skills, both accuracy and speed should develop simultaneously, so that in later the learner/trainee will be able to perform successfully to meet the industry needs, where speed and accuracy is more important for efficiency and profit.

Learners differ in their social and educational back gound, in understanding capacity and hence learner learns at various rate

Trainees/Learners differ as individuals from one another in their mental caliber and emotional behaviour patterns. They differ in expressing and understanding abilities. They learn in various rates. The instructor aim is not to the brightest learners/trainees or for the dullest trainees.

Motivation

Learners will not learn about any matter or thing unless they are motivated or created interest lean to do as desired by the instructor. Motivation in teaching situation is a part of teaching which increases or encourages a desire to learn by the learners. By understanding the learner needs, when a instructor prepares and teaches, that itself a greatest source of motivation for the learners. Then only learners will have a confidence with instructor, gets motivated and learning takes place with interest.

Motivation can be intrinsic and extrinsic in an individual/ learner/trainee. Intrinsic motivation elevates the learner to "self propelled" (self thrust) and leads to effective learning so to reach the desired goals. In case of extrinsic motivation, which is created by instructor/parent providing pleasant learning environment, financial help, recognition or praise.

Sustaining interest for continuous learning

There are two aspect of sustaining interest for continuous learning. One is creating interest in learning and the other is teaching in the manner that maintains interest. Once the learner is motivated the instructor has to consider the following factors to maintain or sustain the interest among the learners.

- Encourage competition in learning activity.
- Give credit to the work well done.
- Show interest in all equally.
- Be impartial in his judgement.
- Reward the deserved learners for their outstanding work.
- Provide proper working conditions.
- Keep the entire class active with appropriate assignments.

Factors affecting learning

It has been found out that the learner's difficulty in learning may be due to many factors within the learner themself. Therefore, it is considered as important to study about the factors affecting learning to solve the problems related to learning and to improve our efforts of teaching and training the learners in developing their competencies.

Psychology reveals that some of the important factors which may affect the learning process are as follows:

Readiness / Preparedness: Readiness / Preparedness are to be mentally ready to learn a skill is called readiness. **Readiness** implies a degree of concentration and eagerness. (Individuals learn best when they are physically, mentally, and emotionally ready to learn) and do not learn well if they see no reason for learning.

I**nterest:** Interest refers to the feeling of **Your activities that you enjoy doing and the subjects that you like to spend time learning about to know or learn about something.** Teachers should make the lesson material relevant and applicable to learner's lives in order to build interest.

Intelligence: Intelligence is a natural capacity and ability which helps the individual to understand and solve the problems according to the situation.

Motivation: Role of motivation on learning engage learners in learning when they feel competent to do what is expected of them and perceive stable link between actions and achievements, they value the subject and have a clear sense of purpose they experience positive emotions towards learning activities.

Attitude: Human attitude is constructed on the bases of one's personal thinking and ideologies he/she likes and dislikes these ideologies create feelings among the individual. Negative attitude slows down the speed of learning and positive attitude speeds up learning process. Teachers must be cognizant of these attitudes and over all employ strategies that encourages positive attitude. Teacher can create love for education, hope, good ideas and development by changing the behaviour of the learner.

Feelings: feelings are the physical sensation we experience in our body and emotions are the labels we give those sensations in our minds. Love, fear and anger are supposed to be the basic feelings. Feeling is a power which leads a person to its successful destination. Negative behaviour of parents, teachers and peers, improper environment, inferiority complex, failure in some tasks also affects the learning process. Teachers should promote positive feelings and emotions. He has to eradicate the feelings of fear and anger from the minds.

Frustration: The feeling of being upset or annoyed, especially because of inability to change or achieve something is called frustration. Frustration is caused by a lack of control over a situation. The best way to handle frustration is to back away from the problem, take a breath, and then approach the problem calmly and rationally.

Aptitude: Aptitude is the potential in the learner, which has as yet not been tapped and trained to a skill level. A learner, who possesses appropriate aptitude for a particular subject of study or skill, will learn better and retain it for a longer time.

Individual Differences: Learners have different strategies, approaches, and capabilities for learning that are a function of prior experience and heredity. Teachers need to help learners examine their learning preferences and expand or modify them, if necessary. The interaction between learner differences and curricular and environmental conditions is another key factor affecting learning outcomes. As teachers/trainers, we must be aware of about learner's individual differences.

Model Questions

Theory 2.2

6 What should be done to sustain interest for continuous learning after motivation?

A Be impartial in judgement

B Repetition

C Revision

D Continuous evaluation

7 What do call the power of a person to achieve destination successfully?

A Learning

B Feeling

C Intelligence

D Aptitude

8 What is required to learn more effectively?

A Based on post experience

B By activity

C Through human senses

D By motivation

9 In learning which implies degree of concentration and eagerness?

A Intelligence

B Motivation

C Attitude

D Readiness

Principles of Teaching Psychology of Learning — Theory 2.3

Laws of learning & Theories of learning

Objectives: At the end of this lesson you shall be able to
- **explain the need for the use of Laws of learning**
- **state the Laws of learning**
- **analyse various theories of learning**
- **identify the importance of human senses in general learning and skill learning**
- **analyse various cause of individual differences.**

Every individual is born with certain unique instincts and learning depends on the satisfaction of these instincts. Individual learner's capacity to learn varies from person to person. In this context, an Instructor must know the learner's attitude towards learning and apply the knowledge of psychology of learning and human behaviour influences in all the phases of training.

One the pioneers of educational psychology, E.L. Thorndike formulated three laws of learning on the early 20th century. The Law of readiness, the law of exercise and the Law of effect. These laws are universally accepted and applied to all kinds of learning. Later on, educational psychologists and pedagogies have discovered, tested some more secondary laws of learning applicable to the learning process and used in practical situations.

We must understand these principles of learning brought out as a result of services of experiments and research. The Instructor should make use of them in training the learners (trainees) in order to maximize their efforts to achieve the goal. In teaching-learning activities the Instructor and the trainees function in cooperation with each other and the goal is achieved adopting/following the laws of learning listed below:

The Law of Readiness

A trainee who is unwilling cannot be made to learn. In fact a ground should be set for acquiring skill or knowledge. The instructor should create an environment that is conducive for making a trainee acquire new skill or knowledge. The trainer must make trainees mentally alert and this alertness can be utilized for creating interest and thus readiness.

The Law of exercise (frequency)

When a particular action is performed repeatedly it becomes a part of the habit. Hence an instructor must be careful in avoiding practice of wrong thing, for otherwise the wrong things get rooted and it is difficult to remove it later. This is also called as the Law of use or newness.

If something is left after learning, it is forgotten. Unless an attempt is made to re-learn it, there is no use. This is called the Law of disuse. Both these laws prove that practice must be continued and repeated exercises must be given to learn and perfect the skills already learnt. Thus intensity of exercise and their repetition makes one to retain longer, knowledge and skills.

The Law of Effect

This is also known as the law of satisfaction and dissatisfaction or Law of pleasure and pain. Any learning that gives satisfaction or pleasure is easily learnt, while the one that gives trouble or pain is not learnt. We have all experienced that once a child burns his fingers in a fire, he is very much afraid to go near to it again.

The Law of Purpose

We are not learning everything that are new or that are useful. We also learn only what is going to be of immediate use to us or what is essential or purposeful. We have keen desire to learn things, which are useful later in life.

The Law of Association

Learning provides new knowledge and skill. We normally learn simple things easier and complex matters are little difficult and so it takes more time. We also learn better about what is known earlier than entirely new knowledge of skill.

The Law of Multiple Learning

Learning cannot be confined to one area. While one is learning a particular lesson he/she also acquires various habits and attitudes that are necessary for meeting the demand of life in general. Discipline, care and maintenance of tools, safeguarding equipment, safety precautions, prevention of misuse of materials and tools, cooperation with others are all other virtues and achievements that are attained along the way.

The Law of Maturity

Learning takes place according to the physical ability of the trainees. An important aspect of skill is to assist the learner to acquire differential control over the body. While one is engaged in skill acquisition, it is better to wait until he is mature enough to learn an act readily, before we attempt to instruct. With enough maturity, he will be able to learn with less time and effort and can enjoy the learning process much more.

The Law Recency

Recently remembered materials are remembered well and reproduced more correctly than remotely learnt thing. But revision has done just half an hour before an examination cannot be recalled well. Perhaps the portions revised the night before can be reproduced better. This emphasizes the need for a thorough revision of portions learnt on the eve of examination if it has to be purposeful.

The Law of Assimilation

Only learning that are assimilated well are retained and reproduced. Not all learning are assimilated, retained and recalled. What is assimilated, retained and reproduced becomes part of learning.

The Law of Active participation

Only when all sensory organs are involved, ensuring better sensation and perception, we say there is active participation. The use of multi sensory educational aids and technique in learning processes and active participation enhanced learning capabilities.

Theories of learning

Learning theories are conceptual framework that describes and guides how the learners absorb, process and retain knowledge during learning.

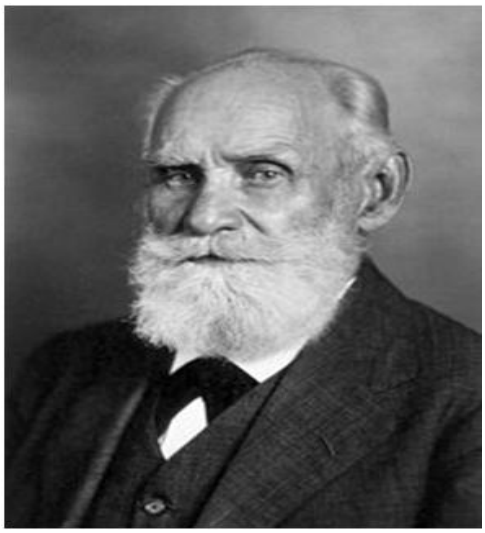
Psychologists, educationists and psysiologists have contributed a lot for the comprehension of the learning experiences which is a complex and complicated process. Results based on the experiments they have contributed to the development of theories of learning. Some of the important learning theories applied in educational and vocational training are as follows:

- Classical conditioning theory (Pavlov)
- Trial and Error theory (Thorndike)
- Insight theory (Kohler)
- Operant conditioning theory (Reinforcement theory) (Skinner)
- Theory of Imitation (Bendura) and so on.

Classical conditioning theory

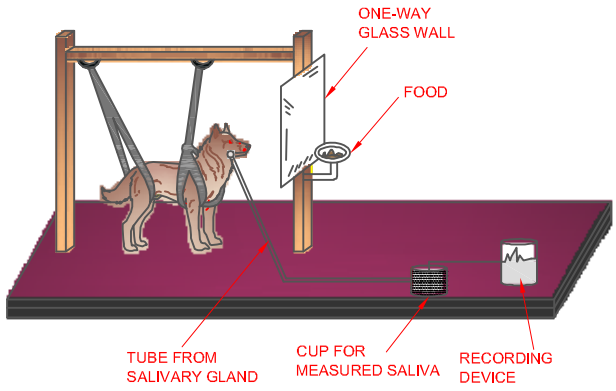
PAVLOV - Ivan Petrovich Pavlov (September 1849 - February 1936) Famous Russian physiologist. Nobel Prize in Physiology or Medicine 1904. Pavlov studied physiology at Leipzig University in Germany for five years.

Pavlov's theory of classical conditioning states that stimulus and response are inter-related while learning process takes place. Pavlov made this theory more clearly by conducting an experiment with a 'dog' as shown in Fig 1. He cut holes in dogs' cheeks and inserted tubes to measure salivation.



Ivan Petrovich Pavlov

Fig 1

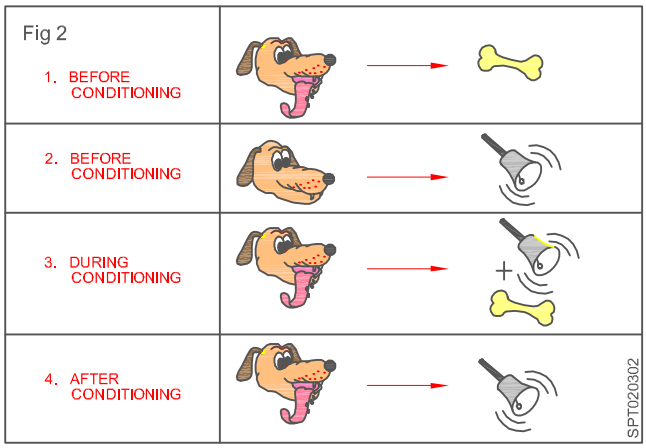


A bell was rung just before food was given to the dog, and after a period of time it was observed that the ringing of the bell alone would increase the rate of the dog's salivation.

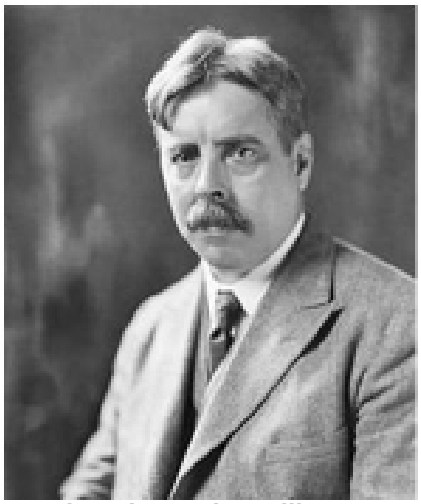
A dog was given food at fixed repeated intervals. A bell was being rung then food was served. This was repeated for many days. One day the bell rang but no food was served. The dog was anticipating for arrival of the food after hearing the ring. It started dripping the saliva. For the dog ringing of the bell was conditioned stimulus and the response of secretion and dripping of the saliva was an unconditioned response. Salivation, Pavlov noted, is a reflexive process. It occurs automatically in response to a specific stimulus and is not under conscious control. The more the stimulus the more the responses shown in Fig 2.

Benefits:

Pavlov's discovery of classical conditioning remains one of the most important in psychology's history, the conditioning process remains important today for numerous applications, including behavioural modification. Classical conditioning is often used to treat phobias, anxiety and panic disorders also.



Trial and Error theory - Edward Lee Thorndike (August 1874 - August 1949)

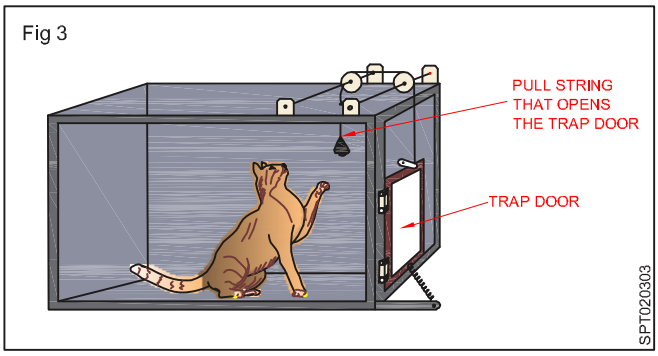


Edward Lee Thorndike

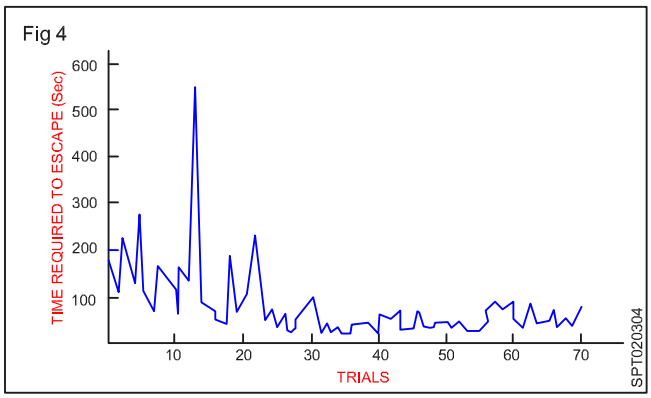
Thorndike - an American psychologist, his work on animal behaviour and the learning process led to the theory of connectionism (a set of approaches in the fields of artificial intelligence and cognitive psychology, helped to lay the scientific foundation for modern educational psychology). He also worked on solving industrial problems, such as employee exams and testing. He has been considered as father of modern educational psychology in US.

In his theory the learners set a goal and he tries to achieve it after making several trails. This theory is known as **Thorndike theory or Trial and Error.** He placed a cat in a cage (Fig 3) and a plate of fish outside the cage. The door arrangement of the cage was such a way that- by stepping on the slot the door opens. The cat tried several time to step on the slot but was not succeeded. Accidentally in one of its attempts stepped on the slot and the door was opened, cat ate the fish. In a similar occasion the cat opened the door easily by stepping on the slot. Similarly we can also learn through trial and error methods.

Thorndike looked at how Cats learned to escape from puzzle boxes.



His finding was that cats consistently showed gradual learning as shown in Fig 4.



Experiment outcome:

- Thorndike's instruments learning curves revealed by plotting the time it took, for an animal to escape the box each time it was in the box.
- If the animals were showing insight, then their time to escape would suddenly drop to a negligible period.
- So it was trial-and-error
- These led Thorndike to formulate first his **Principles of Learning** and then his **Theory of Learning** that became the foundation of modern educational psychology.

Insigt Learning Theory - Kohler Wolfgang Kohler (January 1887 - June 1967)

Wolfgang Kohler

Kohler was one of the founders of Gestalt psychology along with Max Werheimer and Kurt Koffka. He is also famous for his description of insight learning which he tested on animals, particularly chimpanzees. The results of his experiments during the period 1913-1917 were published in German.

When we solve a problem completely, we experience a pleasant feeling called by Kohler the - "AHA Experience". We say as, we suddenly see the answer to the problem. To illustrate the insight learning, observe the following series of numbers. Which number should follow the sequence- 1491625?. If you cannot solve the problem then come back to the problem. Try different arrangement or perceptual organization of the numbers. 1, 2, 3, 4, 5... or odd numbers or even numbers or 12, 22, 32, etc. If you solve the problem you will have a pleasant experience that is AHA Experience!. Note that your solution came suddenly after some time, which you tried, various strategies. Perceptual arrangements helped a great deal. The solution ones you have it can be generalized rather easily or other similar number of problems. These are the characteristics of insight learning.

Insight Learning Theory Experiment:

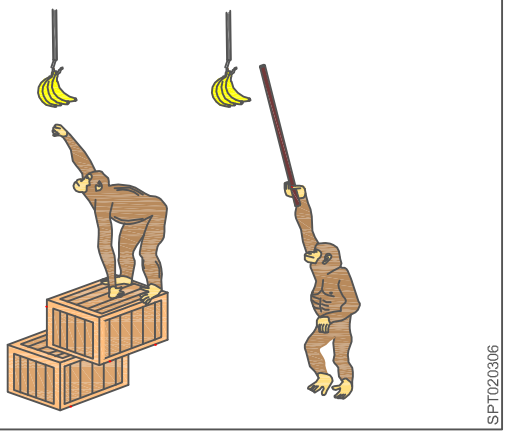
How insight learning occurs? The cognitive answer to the question is the insight involves a perceptual re-organization of elements in the environment. Kohler worked out a number of insight experiments on chimpanzees and summarized the findings.

Kohler employed five types of problems to study how the chimpanzees solve complex problems. The two most fascinating and important problems were the 'stick' problem and the 'box' problem both the problems involved insightfull solution as shown in Figs 5 & 6.

Fig 5

Two hollow bamboo sticks, one long and the other short, were kept inside the cage. Since the sticks were hollow, one stick could be pushed into one end of the other to form a longer stick. However, if the two sticks are joined, banana could be reached. First he tried with a short stick to pull the bananas, he failed. After fidding with the stick for sometime he realized that the stick was too short to pull the bananas, the longer one would solve the problem without fidding. He tired with longer stick, through which he got the banana and ate it. The learner acts according to the situation and achieves success and in a similar situation next time they acts without any problem because of his past experience.

Fig 6

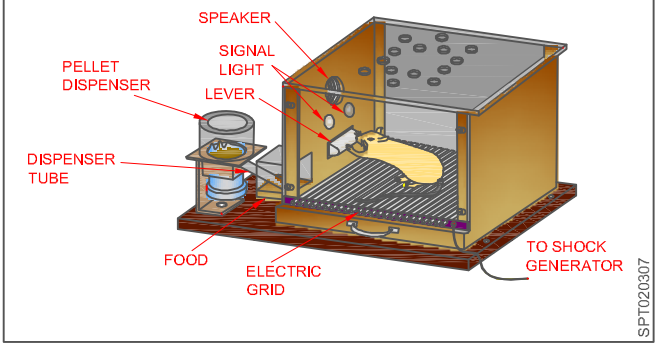


Operant conditioning theory B.F Skinner (Mar 1904-Aug 1990)

An Americal psychologist behaviourist, he was the Edgar Pierce Professor of Psychology at Harvard University. Skinner (1948) is regarded as the father of operant conditioning, but his work has based on Thorndike (1898) Law of effect. Skinner introduced a new term Reinforcement. That is, behaviour which is reinforced tends to be repeated (i.e., strengthened); behaviour which is not reinforced tends to die-out or be extinguished. (i.e. weakened).

Skinner studied operant conditioning by conducting experiment using rats which he placed in a 'Skinner box' similar to Thorndike's puzzle box as shown in Fig 7.

Fig 7



Skinner identified three types of responses or operants that can follow behaviour

- Neutral operants
- Reinforces
- Punishers

Positive reinforcement

Skinner showed how positive reinforcement worked by placing a hungry rat in the above box. The box contained a lever on the side and as the rat moved about the box, it

would accidentally knock the lever. Immediately it did so a food pellet would drop into a container next to the lever. The rat quickly learned to go straight to the lever after a few times of being put in the box. The consequence of receiving food if they pressed the lever ensured that they would repeat the action again and again. Positive reinforcement strengthens a behaviour by providing a consequence an individual finds rewarding.

Negative reinforcement

Negative reinforcement strengthens behaviour because it stops or removes an unpleasant experience. The removal of an unpleasant reinforce can also strengthen behaviour. In fact Skinner even taught the rate by subjecting them in the box with an unpleasant electric current which caused it some discomfort. The rats soon learnt to press the lever when the light came on because they know that this would stop the electric current being switched ON.

Punishment

Punishment is defined as the opposite of reinforcement since it is designed to weaken or eliminate a response rather than increase it. It is an aversive event that decreases the behaviour that follows.

Punished behaviour creates fear and does not necessarily guide towards desired behaviour - reinforcement tells you what to do, punishment only tells you what not to do.

Theory of Imitation

Albert Bondura - Canadian - Americal psychologist, professor at Standfort University - His social learning theroy poists that people learn from one another, via observation, imitation and modeling. The theory has often been called a bridge between behaviourist and cognitive learning theories because it encompasses the attention, memory and motivation.

Theory

We all try to imitate. Children try to imitate action of their elders. Imitation is learnt from school, institute, home and outside environment. Imitation is considered to be one of the natural qualities of human being. From elders/adults imitate like their precedents. Imitation is very useful in attaining skill. The imitation can be effected consciously or unconsciously. Sometime, complex and tough actions either new or difficult to imitate also reduces this specific skill. Imitation helps backward learners. It has some disadvantages some times bad qualities are also learnt through imitation. It is the responsibility of the instructor to guide the learner properly to avoid imitating wrong methods and means instrument or agency to learn a skill or attitude. Many teachers and parents today realize the importance of modelling acceptable behaviour.

In addition to the above theories of learning the following aspects are also to be considered by the instructor.

Senses are avenues of Learning

Human have five basic senses. These sensing organs associated with each sence and information to begin to help us understand and perceive the world around us.

Sensory learning is concerned with perception and sense. Sense organs are generally called the “Gates of knowledge”. A particular type of knowledge is acquired through a particular sense organ. With the associations and reaction to the environment, sense organs grow conscious. They are:

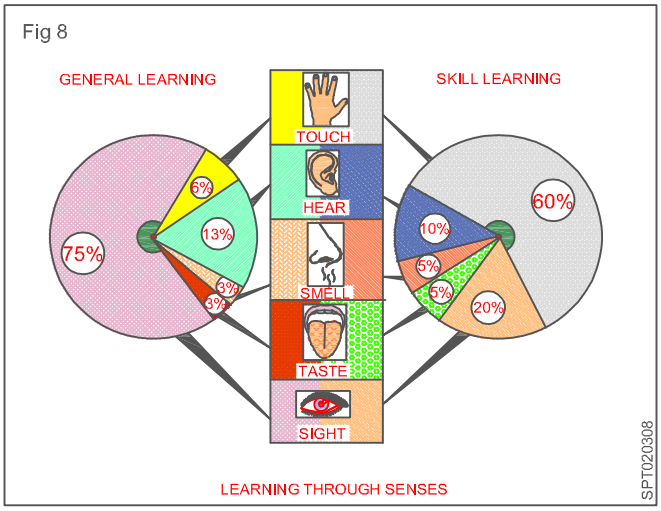
- **Sense of sight (Visual sensation**) is through **eyes.** Colour, similarity, dissimilarity, reading and for all visual stimuli we use with eyes.
- **Sense of hearing (Auditory sensation)** is through **ears.** Sounds of different nature - teacher’s talk, discussions, sounds made by machines and materials or any other voice or sound reaches the ears as a stimuli eliciting responses.
- **Sense of small (Factory sensation)** is through the **nose.** We can identify different oils, burning of rubber insulation or a coil immediately through the smell, as and when proper response occurs.
- **Sense of taste (Gustatory sensation)** is through **tongue.** We use the tongue to know taste and through the taste we find difference between sweet, salt, tea, coffee, cheese, butter etc. In the food processing or catering field, this sense is much in use.
- **Sense of touch (Tactual sensation)** is through links or parts of body. Touching enables one to find out smoothness, softness, hardness and roughness of different degrees. By proper utilization of this sensation even blind men develop strong stimuli to other responses involving other organs.

Kin aesthesis **(Muscular sense)**. We perceive through muscular feel when pressing, pulling, pushing, holding, balancing etc.

All the six senses play important part in acquisition of motor skills and knowledge and they are known as avenues of learning. A good instructor exploits as many senses as possible and each of the sense responds only to its own type of stimuli.

A comparative statement of various sense organs and their effectiveness under general learning (knowledge) situation and Skill learning (practical) situation are graphically shown in Fig 8 and the same is given in the Table.

Fig 8



Individual Differences

All the trainers/learners do not have alike, the difference may be physical, mental and psychological.

- **Physiological differences:** Fatness, leaness, darkness, fairness, tallness, shortness of stature are various physical differences. Some of these have adverse effect on the motor learning.
- **Mental differences:** Intelligence, foolishness, mental backwardness is due to the traits of people, differs from one another.
- **Psychological differences:** Some are liberal while others are not. Some have certain special traits to learn certain subject or doing certain jobs. Some learn quickly while others slowly.

Causes of individual differences

- **Heredity:** Genes are responsible for individual differences. Parents play an important role in the individual differences.
- **Environment:** Environment has various features - Physical and social. Social environment play a more important part in creating individual differences.
- **Age:** Age is another factor to be reckoned in this. Physical psychological and emotional development is caused by the growth in age.
- **Intelligence:** Some have higher I.Q. Some are mentally backward and retarded while some are exceptionally intelligent.
- **Economic condition:** Economic condition of parents does cause individual differences.

The instructor must take into account these differences and pay special attention to those who require the specific technique to bridge the gap.

Sl. No.	Name of the sense	General learning (Knowledge)	Skill learning (Practical)	Remarks
1	Sight - Eyes	75%	20%	
2	Hearing - Ears	13%	10%	
3	Touch - Hands	6%	60%	
4	Smell - Nose	3%	5%	
5	Taste - Tongue	3%	5%	

Model Questions

Theory 2.3

10 What is the percentage of general learning (knowledge) through hearing and ears

A 13%

B 6%

C 4%

D 3%

11 Which play a more important role in creating individual differences

A Age

B Heridity

C Environment

D Economic condition

Principles of Teaching Psychology of Learning

Motivation in teaching & learning process

Objectives: At the end of this lesson you shall be able to

- **define the concept of motivation**
- **list the types of motivation in teaching and training**
- **analyse the result of reinforcement in learning motivation**
- **explain the motivational functions of instructor in modifying the behaviour of learners.**

The terms 'motivation' is derived from the word "motive" which may be defined as needs wants, drives or impulses within an individual.

Motivation is the hidden force within us which impels us to behave in a particular way. The inducement to the people to contribute as effectively and as efficiently as possible is called motivation.

Human motives are based on needs, desire, wishes, drives, interests inclination, purpose etc. Thus, motivation is an act of energising and activating the people to satisfy their needs.

Motivation is the important factor in the learning process. It is important for an instructor to know the general principles of motivation.

In the field of teaching and training two fundamentally different types of motives may be distinguished.

"Intrinsic" motives drive for knowledge and activity without the consideration of the result or consequence.

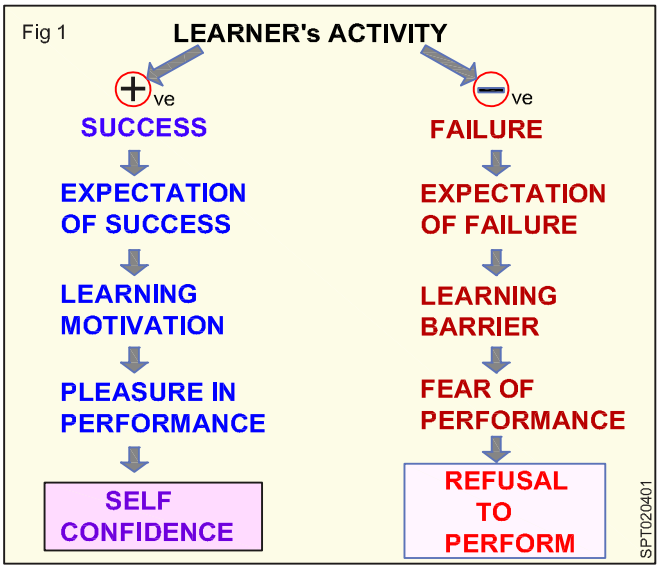
"Extrinsic" motives which are directed towards the achievement of goal such as learning a skill in order to earn money.

Trainer have a tendency to value intrinsic motivation more highly than extrinsic motivation. Extrinsic motivation, however, cannot be fully neglected and should not be looked separately.

Reinforcement

Reinforcement plays an important role in influencing the learning process. Reinforcement occurs when the learner can see that his efforts have led to success. A person who has such a pleasant experience of success will quite understandably have a tendency to repeat the activity again and again. In this way successful learning can lead to a continually renewed willingness to learn. A person whose efforts have met with failure for long enough and frequently enough will have an expectation of failure before every new learning situation. This negative reinforcement acts as a barrier to learning. (Fig 1)

Fig 1



Behaviour modification

The behaviour modification techniques that a teacher or instructor can adopt includes.

- **Extinction :** Ignoring failures to reinforce "undesirable forms of behaviour or mistakes" by not noticing them.
- **Counter conditioning :** "Undesirable form of behaviour or mistakes" leads to an unpleasant experience for the learner. (Punishment, scolding, reprimands, marking mistakes with thick red pencils / pen, condemnation etc.)
- **Learning by imitation :** The teacher or instructor is himself a model or provides a behavioural model in some other way.

Motivational function of the trainer / instructor

From the available theory and data of the educational psychology, the teacher should perform four functions to motivate the learners. These are:

Arousal function

It is to arouse and maintain learner's interest. It involves the initial responsibility of winning the learner's attention (readiness to receive the lesson) and the continuing responsibility of regulating the level of arousal to avoid both sleep and emotional eruption. To meet this, the trainer

should make the lesson interesting to the learners by bringing them within the learner's intellectual range and helping them to understand that it is worth and valuable. Changing the position, tone of voice, mood of the trainer, teaching valuable from one technique to another etc, all the lead to increased motivation of learner.

Expectance function

It is to maintain or modify the learner's expectation of success or failure in reaching the instructional objectives. It requires the trainer to describe concretely for learners what they will be able to do after the lesson.

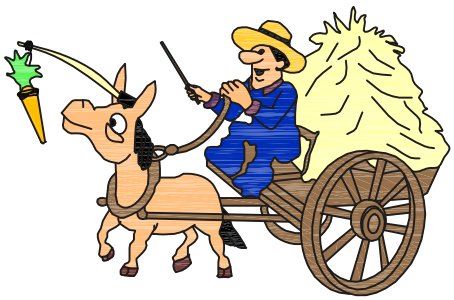
Incentive function

It is to encourage learner in his further effort in the pursuit of instructional objectives. Feedback of test results, spoken or written praise or blame, grading, competition and co-operation are some of the established methods as successful incentives for learners which increase learner's vigour in learning. However, care must be taken that these incentives do not come as discouragement to other groups of learners.

Disciplinary function

It is to control the deviant behaviour of the learners through the use of reward and punishment. A punishment procedure which involves both the suppression of undesired response (or behaviour) and the provision of an alternative reward for desired response (or behaviour) may be a most effective procedure. This artful combination of punishment and reward as a disciplinary technique is called "restitution". This technique should be adopted by the trainer in a non-threatening manner.

Fig 2



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Techniques of motivation

In order to create effective motivation, the trainer or instructor should avoid the precipitous path of negative reinforcement. In general attention should be paid to the consistent use of reinforcement to promote positive types of behaviour and achievement through encouragement. In appropriate behaviours and errors should be largely ignored. In addition, the following steps may be taken to create effective motivation:

- Unambiguous objectives and a clear view of the subject as a whole the learner's motivation is increased.
- Connection with the learner's own interests and elucidation of ways in which the results of his learning can be put to practical use.
- Setting of tasks with a moderate degree of difficulty and a flexible range of difficulty. This results in a challenge to make an effort as well as the experience of success in learning.
- Interesting and challenging formulation of questions:
  - a Creating surprise
  - b Producing uncertainty
  - c Raising objectives,
  - d Provoking learners by taking an extreme point of view
  - e Arousing doubts, setting conflicting requirements
- Stimulation of independent learning by extending the periods of independent activity during learning process. Appropriate methods include goup discussion, individual and group work, projects, role-playing etc.
- Feed back concerning learning success which encourages positive reinforcement of learning.

Learning starts with what learner knows, and not what the instructor / teacher knows or starts.

"Learning is change in behaviour"

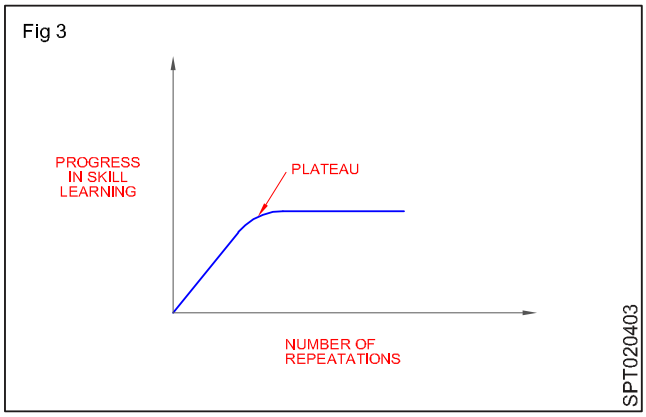
- What learning means.
- Focal area in psychology of learning.
- Needs of learner.
- Learning materials.
- Learning methods.
- Readiness to learn.
- Methods of Instruction.
- Learning by interaction.
- Environment.
- Psychological factors.
- Types of learning.
- Factors affecting learning process.

What learning means

Learning is a process by which an individual acquires various habits, knowledge, skill and attitude that are required for meeting certain objectives. Learning changes the behaviour of individuals.

For simple job initial learning is fast and the learning curve shows steep rise (Fig 3). The curve becomes flat as learning slow down. For simple tasks, steep initial rise in performance and study flattening of performance is the main objective while for complex skill, there may be number of flattening which refers to hold up or fatigue in the process.

Fig 3



Learning situation

Learning situation that provides necessary atmosphere required for the acquisition of knowledge, attitudes and skills. If any one of these is not satisfactory it affects the effective learning. The learning situation provides opportunity for learning. The learning situation determines the quality and speed of is to provide good learning situation to the learner.

Needs of learner

Learning can take place in response felt needs of the learner. When the learner knows the needs of learning, the learning will be more effective. The instructor should display their needs, then only can make them to start learning.

Learning materials (content)

It is the content to be learnt by the learner. It should be according to the mental level of the trainees. The content should be presented in a language that could be understood by the learner. If the content is in their own mother tongue / Regional language the learning will be more effective.

The learning methods

Comprehensive (understanding) learning is better that cursory (Hasty) learning. Whole learning is better than part learning. Self evaluation, periodical revision, repetition of learning and altering modes (manner) of learning are much important. Learning by trial and error needs good amount of energy. The method of learning is also depends on the age maturity.

Rediness of learn

For learning rediness is the most important factor. Learning is based in physical, social, intellectual and emotional growth. It is very important that the learner rediness should be ascertained before starting learning process. The instructor should know the maturity back ground of the learners for certain kind of learnings. In mass education teaching, this is not possible to achieve rediness of all trainees as such some may be ready and some may not be and this kind of individual differences cannot be avoided.

Method of instruction

The instructional methods affects the learning process. If the instructional method is not related to the requirements of learner, the learning will be ineffective. The method of instruction should be in cognizance (knowledgeable) to the instructional objectives. The method of teaching should not be mechanical. The active participation of the trainees in the teaching, accelerates the absorption of what trainees learnt. For effective and faster learning teaching and training aids may be used. The training aids help the learner to retain better, what the trainees learnt. Remedial instructions helps the backward trainers.

Learning by interaction

When a learner feels the needs of the objectives to learn and to achieve the goal they set for themself, learns by interacting in the learning situation. The process of responding to the situation and feels satisfaction for what they have learnt.

Environment

Physical, residential and social environment is very important. Outside the institute the trainee must have facility to apply the knowledge and skill. It is necessary for instructor and the institute administration to develop and create healthy and congenial environment which can bring about good qualities and character in the trainees. The environment helps the trainees in future in their life to become good craftsman and better citizens.

Psychological factors

Learning is a process involving communication between the trainee and instructor. Cordial relationship provide security and trainees attention. Psychological factor helps for improving self-expression, self ascertain and satisfaction. Personality requirements are quite important for efficient learning. Discipline, attitude of instructor, ability of administrators and involvement of all these connected are equally important for providing better learning conditions.

Model Questions

Theory 2.4

12 What causes the trainee when stimulations imparted?

A Arousing doubts
B Creating surprise
C Raising objectives
D Independent activity during learning process

13 What will be the effect when asking interesting and challenging formulation of questions?

A Producing certaincity
B Producing uncertaincity
C Clearing the arousing doubts
D Extending the period of independent activity

UNIT - III

NSQF AND ANALYSIS OF SYLLABUS

Learning Outcomes to be achieved from this unit:

- **Develop ideal instructor characteristics**
- **Read and understand the competency based curriculumof NSQFcompliant curriculum (NSQF format)**

Theory 3.1

I Multiple Choice Question items

Choose the correct answer:

1 How many domains are described in each level of the NSQF?

A 3

B 4

C 5

D 6

2 What is the name of the domain in NSQF describe the learner should be able to do?

A Process

B Core skill

C Professional knowledge

D Professional skill

Theory3.2

3 How the trainee performance in respect of the trade's learning outcome are to be recognised?

A Job role

B Specific learning outcome

C Generic learning outcome

D Assessment criteria

4 What is the name of the learning outcome which is specific to the trade?

A Specific learning outcome

B Generic learning outcome

C Special learning outcome

D Typical learning outcome

Theory 3.3

5 Which part of the course outline deal with a fundamentals of training?

A First part

B Second part

C Third part

D Fourth part

6 What is the necessity of analysing the syllabus?

A To teach from simple to complex

B To teach from complex to simple

C To teach from average to simple

D To teach from average to complex

Theory 3.4

7 Which learning evaluation is often utilised during the evaluation phase of the ADDIE process?

A Kirkpatrick's Evaluation

B Sign-Gestalts Evaluation

C Kohler Evaluation

D Parlor Evaluation

8 Which phase of the ADDIE deals with learning objectives?

A Analysis phase

B Design phase

C Development phase

D Evaluation phase

NSQF and implementation in vocational training

Objectives: At the end of this lesson you shall be able to
- **define NSQF**
- **state the objectives and key element of NSQF**
- **list and state the NSQF levels and their discriptor**
- **state the approach of implementation of NSQF in vocational training.**

NSQF

The National Skills Qualifications Framework (NSQF) is a competency-based framework that organises all qualifications according to a series of levels of knowledge, skills and aptitude.

Objectives of NSQF

The objectives of the NSQF are to provide a framework that:

- Accommodates the diversity of the Indian education and training systems
- Allows the development of a set of qualifications for each level, based on outcomes which are accepted across the nation
- Provides structure for development and maintenance of progression pathways which provide access to qualifications and assist people to move easily and readily between different education and training sectors and between those sectors and the labour market
- Gives individuals an option to progress through education and training and gain recognition for their prior learning and experiences
- Underpins national regulatory and quality assurance arrangements for education and training
- Supports and enhances the national and international mobility of persons with NSQF compliant qualifications through increased recognition of the value and comparability of Indian qualifications

The NSQF is a quality assurance framework it facilitates the awarding of credit and supports credit transfer and progression routes within the Indian education and training system. It seeks to help everyone involved in education and training to make comparisons between qualifications offered in the country, and to understand how these relate to each other.

National skills qualification framework: (Resource: Govt. Gazette)

The National Skills Qualification Framework (NSQF) organises qualifications according to a series of levels of knowledge, skills and aptitude. These levels are defined in terms of learning outcomes which the learner must possess regardless of whether they were acquired through formal, non-formal or informal learning. In that sense, the NSQF is a quality assurance framework. It is, therefore, a nationally integrated education and competency based skill framework that will provide for multiple pathways, horizontal as well as vertical, both within vocational education, vocational training, among vocational education, vocational training, general education and technical education, thus linking one level of learning to another higher level. This will enable a person to acquire desired competency levels, transit to the job market and, at an opportune time, return for acquiring additional skills to further upgrade their competencies.

The key elements of the NSQF provide:

- National principles for recognising skill proficiency and competencies at different levels leading to international equivalency
- Multiple entry and exit between vocational education, skill training, general education, technical education and job markets
- Progression pathways defined within skill qualification framework
- Opportunities to promote lifelong learning and skill development
- Partnership with industry/employers
- A transparent, accountable and credible mechanism for skill development across various sectors
- Increased potential for recognition of prior learning.

The qualification framework is beneficial to schools, vocational education and training providers, higher education institutes, accrediting authorities as well as industry and its representative bodies, unions, professional associations and licensing authorities. The biggest beneficiaries of such a framework are the learners who can judge the relative value of a qualification at a particular level on the framework and make informed decisions about their career progression paths.

International experience with qualification frameworks:

A paradigm shift from education based on inputs towards education based on learning outcomes is taking place. Outcomes-based learning is a widely used term. The shift to learning outcomes is important for a number of reasons:

- It shifts focus from providers to users of education and training.
- By explaining what a learner is expected to know, understand or be able to do at the end of a learning process, individuals are better able to see what is offered in a particular course and how this links with other courses and programs.
- It increases transparency and strengthens accountability of qualifications for the benefit of individual learners and employers.
- The vast majority of the world's industrialised and transition countries are reforming their qualifications, while at the same time developing frameworks to relate these qualifications to each other and to generally reflect new demands in society and the labour market.
- The development of these systems is often linked to changes in higher education, technical & vocational education and training (TVET) and lifelong learning.

Many countries worldwide are in the process of introducing qualification frameworks. Though the theoretical principles of all frameworks remain largely similar, the objectives of launching the frameworks vary. Whether the emphasis is on increasing the relevance and flexibility of education and training programs, easing recognition of prior learning, enhancing lifelong learning, improving the transparency of qualification systems, creating possibilities for credit accumulation and transfer, or developing quality assurance systems, Government are increasingly turning to qualifications frameworks as a policy tool for reform. In some cases national developments are propelled by the emergence of regional frameworks (such as the European Qualification Framework). In many cases the implementation of qualification frameworks has been widely supported by international organisations and is often linked to aid money and even loans. There is increasing activity from international agencies in the area of qualifications frameworks: the Organisation for Economic Cooperation and Development (OECD), the International Labour Office (ILO), the World Bank (WB) and the European Union (EU) have current qualification framework projects.

Background of development of qualification framework in India

Through the National Policy on Skill Development, 2009, India recognised the need for the development of a national qualification framework that would transcend both general education and vocational education and training. The Policy envisioned that the framework will stimulate and support reforms in skills development and facilitate establishment of nationally standardized and acceptable, and internationally comparable qualifications. In the absence of an organisation at the central level to develop such a framework, individual ministries started working on development of the framework, which were to subsequently be subsumed in the National framework, when available. The Ministry of Labour and Employment developed the National Vocational Qualifications Framework (NVQF) and the Ministry of Human Resource Development developed the National Vocational Educational Qualification Framework (NVEQF). The Ministry of Human Resource Development also launched a pilot of the NVEQF in Haryana at the secondary school level.

Realizing the need to have a unified framework, an Inter-Ministerial Committee was formed by the Cabinet Secretariat to use the work already done by the two Ministries as the foundation of the National Skills Qualification Framework. With the formation of the National Skill Development Agency, the mandate to anchor and operationalise the NSQF to ensure that quality and standards meet sector specific requirements was transferred to the Agency.

Need for qualification framework in India

In India, general education and vocational education & training have been operating as separate verticals, with very little interaction between the two. This has led to hesitation amongst the youth in opting for vocational education and training as it is presumed that this avenue would preclude the concerned individual from being able to acquire higher degrees and qualifications. In order to facilitate mobility from vocational to general education, and vice-versa, a qualification framework for India, i.e. the National Skill Qualification Framework (NSQF) will help make qualifications more understandable and transparent.

The need for the NSQF arises due to the following additional reasons:

- Till now the focus of education and training has been almost entirely on inputs. The NSQF is based on an outcomes-based approach, and each level in the NSQF is defined and described in terms of competency levels that would need to be achieved. Job roles corresponding to each of these competency levels would be ascertained with the involvement of industry, through the respective Sector Skill Councils (SSCs).
- Pathways of learning and progression, especially on the vocational education and training front, are generally unclear or absent. There is no clear provision for vertical or horizontal mobility. The NSQF will make the progression pathways transparent so that institutes, students and employers are clear as to what they can or cannot do after pursuing a particular course and address the issues of inequity and disparity in qualifications

- There is lack of uniformity in the outcomes associated with different qualifications across institutions, each with its own duration, curriculum, entry requirements as well as title. This often leads to problems in establishing equivalence of certificates/diplomas/ degrees in different parts of the country, which in turn impacts the employability and mobility of students
- The negative perception associated with vocational education and training can be significantly removed by the development of quality qualifications that also permit acquisition of higher qualifications, including degrees and doctorates
- There exist a large section of people who have acquired skills in the informal sector but who do not have the necessary formal certifications to attest to their skills. As a competency-based and outcomes based qualification framework, NSQF will facilitate Recognition of Prior Learning (RPL) that is largely lacking in the present education and training scenario
- Majority of Indian qualifications are not recognised internationally and vice-versa. This creates a problem for the students and workers as their international mobility is adversely affected and they often have to undergo a course again to get a qualification that is recognised in the host country. The NSQF will also help alignment of Indian qualifications to international qualifications in accordance with relevant bilateral and multilateral agreements. Many countries are already in the process of aligning their qualifications to international qualifications through qualification frameworks
- The credit accumulation and transfer system that will be integrated in the NSQF will allow people to move between education, vocational training and work at different stages in their lives according to their needs and convenience. It will be possible for a student to leave education domain, get some practical experience in industry and return to studies to gain qualifications to progress higher in his chosen career.

Level descriptors

- Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.
- Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:
  - Process
  - Professional knowledge,
  - Professional skill,
  - Core skill and
  - Responsibility.

Each of these is briefly described below:

- **Process**
  - Process is a general summary of the other four domains corresponding to the level.
  - It is implemental in all activities of vocational trainer.
- **Professional knowledge**
  - Professional knowledge is what a learner should know and understand with reference to the subject. It is described in terms of depth, breadth, kinds of knowledge and complexity, as follows:
  - Depth of knowledge can be general or specialised
  - Breadth of knowledge can range from a single topic to multi-disciplinary area of knowledge
  - Kinds of knowledge range from concrete to abstract, from segmented to cumulative
  - Complexity of knowledge refers to the combination of kinds, depth and breadth of knowledge.
  - This domain is implemented in RT lesson/ vocational trainer.
- **Professional skill**

Professional skills are what a learner should be able to do. These are described in terms of the kinds and complexity of skills and include:

- Cognitive and creative skills involving the use of intuitive, logical and critical thinking.
- Communication skills involving written, oral, literacy and numeracy skills.
- Interpersonal skills and generic skills.
- This domain is implemented in practical exercises in vocational training.

- **Core skill**

Core skills refer to basic skills involving dexterity and the use of methods, materials, tools and instruments used for performing the job, including IT skills needed for that level.

This domain is implemented in workshop science, engineering drawing, employability skill.

- **Responsibility**

  Responsibility aspect determines the following:
  - Nature of working relationships.
  - Level of responsibility for self and others.
  - Managing change.
  - Accountability for actions.
  - This domain is also implemented for all learn and trainer activity in vocational training.

- The descriptors give broad, general, but meaningful, indicators of the learning outcomes at each level. The descriptors can be used in a number of ways:
  - To allocate levels to learning programs and qualifications.
  - In validation and moderation of various qualifications and programs.
  - As a basis for communication with learners and other users of qualifications.
  - As a guide for mapping progression routes within and across the education and training sectors.
  - By program designers when making entry requirements and recommendations for programs

The, given below table states 10 level but in all only 5 levels are accomplished for craftsman training under vocational training scheme.

The NSQF level with descriptors are given below for vocational training in ITI's

Level	Process required	Professional knowledge	Professional Skill	Core Skill	Responsibility
Level 1	Prepares person to/carry out process that are repetitive on regular basis require no previous practice	Familiar with common trade terminology, instructional words meaning and understanding	Routine and repetitive, takes safety and security measures	Reading and writing, addition, subtraction personal financing, familiarity with social and religious diversity, hygiene and environment	No responsibility always works works under continuous instruction and close supervision
Level 2	Prepares person to/carry out process that are repetitive on regular basis with little application of understanding, more of practice	Material tools and application in a limited context, understands, context of work and quality	Limited service skill used in limited context, select and apply tools, assist in professional works with no variables differentiates good and bad quality	Receive and transmit written and oral messages, basic arithmetic personal financing understanding of social political and religious diversity, hygiene and environment	No responsibility works under instruction and close supervision
Level 3	Person carry put a job which many require limited range of activities routine and predictable	Basic facts, process and principle applied in trade of employment	Recall and demonstrate practical skill, routine and repetitive in narrow range of application	Communication written and oral, with minimum required clarity, skill of basic arithmetic and algebraic principles, personal banking, basic understanding of social and natural environment	Under close supervision Some Responsibility for work within defined limit

Level	Process required	Professional knowledge	Professional Skill	Core Skill	Responsibility
Level 4	Work in familiar, predictable, routine, situation of clear choice	Factual knowledge of field of knowledge of study	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social political and natural environment	Responsibility for own work and learning
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context	Knowledge of facts, principles, process and of general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Desired mathematical skill, understanding of social, political and some skill of collecting and organising information communication	Responsibility for own work and learning and some responsibility for other's works and learning
Level 6	Demands wide range of specialised technical skill, clarity of knowledge and practice in broad range of activity involving standard non standard practices	Factual and theoretical knowledge in broad contexts within in field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Reasonably good in mathematical calculation, understanding of social, political and, reasonably good in data collecting organising information and logical communication	Responsibility for own work and learning and full responsibility for others works and learning
Level 7	Requires a command of wide ranging specialised theoretical and practical skill, involving variable routing and non-routine	Wide ranging factual and theoretical knowledge in broad contexts within a field of work or study	Wide range of cognitive and practical skills required to to generate solutions to specific problems in a field of work or study	Good logical and mathematical skill understanding of social political and natural environment good in collecting and organising information, communication and presentation skill	Full responsibility for output of group and development
Level 8	Comprehensive, cognitive, theoretical knowledge and practical skills to develop creative solutions, to abstract problem. Under-takes self study, demonstrates intellectual independence, analytical rig our and good communication			Exercise management and super-vision in the context of work/study having unpredictable changes, responsible for development of self and others	
Level 9	Advanced Knowledge and skill Critical understanding of the subject, demonstrating mastery and innovation, completion of substantial research and dissertation			Responsible for decision making in complex technical activities, involving unpredictable study/work situations	
Level 10	Highly specialised knowledge and problem solving skill to provide original contribution to knowledge through research and scholarship			Responsible for strategic decisions in unpredictable complex situations of work/study	

Job roles, learning out comes and assessment criteria

Objectives: At the end of this lesson you shall be able to
- **define job role**
- **describe learning outcome**
- **explain the assessment criteria.**

Job role

Job role defines set of functions that together form a unique employment opportunity in an organisation.

In the trade syllabus job role at the trades are given.

For example, the job role of Electrician trade is given below.

Job role - Electrician trade

Electrician General: Installs, maintains and repairs electrical machinery equipment and fittings in factories, workshops power house, business and residential premises etc. Studies drawings and other specifications to determine electrical circuit, installation details etc. Positions and installs electrical motors, transformers, switchgears. Switchboards and other electrical equipment, fittings and lighting fixtures. Makes connections and solders terminals. Tests electrical installations and equipment and locates faults using megger, test lamps etc. Repairs or replaces defective wiring, burnt out fuses and defective parts and keeps fittings and fixtures in working order. May do armature winding, draw wires and cables and do simple cable jointing. May operate, attend and maintain electrical motors, pumps etc.

Electrical Fitter: Fits and assembles electrical machinery and equipment such as motors, transformers, generators, switchgears, fans etc., Studies drawings and wiring diagrams of fittings, wiring and assemblies to be made. Collects prefabricated electrical and mechanical components according to drawing and wiring diagrams and checks them with gauges, megger etc. to ensure proper function and accuracy. Fits mechanical components, resistance, insulators, etc., as per specifications, doing supplementary tooling where necessary. Follows wiring diagrams, makes electrical connections and solders points as specified. Checks for continuity, resistance, circuit shorting, leakage, earthing, etc. at each stage of assembly using megger, ammeter, voltmeter and other appliances and ensures stipulated performance of both mechanical and electrical components filled in assembly. Erects various equipment such as bus bars, panel boards, electrical posts, fuse boxes switch gears, meters, relays etc. using nonconductors, insulation hoisting equipment as necessary for receipt and distribution of electrical current to feeder lines. Installs motors, generators, transformer etc. as per drawings using lifting and hoisting equipment as necessary, does prescribed electrical wiring, and connects to supply line. Locates faults in case of breakdown and replaces blown out fuse, burnt coils, switches, conductors etc. as required. Checks, dismantles, repairs and overhauls electrical units periodically or as required according to scheduled procedure. May test coils. May specialize in repairs of particular equipment manufacturing, installation or power house work and be designated accordingly.

Learning outcome

Learning outcomes represent what a learner knows, understands and is able to do on completion of a learning process, and which would be expressed in terms of knowledge, skills and competence.

1 Generic learning outcome

Learning outcomes usually specific more general area of learning.

2 Specific learning outcome

Learning outcomes specific to the trade and must be achievable by student with in the time available.

In the every trade syllabus the learning outcome has mentioned as below:

Learning/Assessable outcome - Electrician trade

Generic learning outcome

- Apply safe working practices
- Comply environment regulation and housekeeping
- Interpret & use company and technical communication
- Demonstrate basic mathematical concept and principles to perform practical operations
- Understand and explain basic science in the field of study including simple machine

- Read and apply engineering drawing for different application in the field of work
- Understand and apply the concept in productivity, quality tools, and labour welfare legislation in day to day work to improve productivity & quality
- Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources
- Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & social growth
- Utilize basic computer applications and internet to take benefit of IT developments in the industry.

Specific learning outcome - Electrician trade

- Prepare profile with an appropriate accuracy as per drawing
- Prepare electrical wire joints, carry out soldering, crimping and measure insulation resistance of underground cable
- Verify characteristics of electrical and magnetic circuits
- Install, test and maintenance of batteries and solar cell
- Estimate, Assemble, install and test wiring system
- Plan and prepare Earthing installation
- Plan and execute electrical illumination system and test
- Select and perform measurements using analog / digital instruments
- Perform testing, verify errors and calibrate instruments
- Plan and carry out installation, fault detection and repairing of domestic appliances
- Execute testing, evaluate performance and maintenance of transformer
- Plan, Execute commissioning and evaluate performance of DC machines
- Execute testing, and maintenance of DC machines and motor starters
- Plan, Execute commissioning and evaluate performance of AC motors
- Execute testing, and maintenance of AC motors and starters
- Plan, execute testing, evaluate performance and carry out maintenance of Alternator / MG set
- Execute parallel operation of alternators
- Distinguish, organise and perform motor winding
- Assemble simple electronic circuits and test for functioning
- Assemble accessories and carry out wiring of control cabinets and equipment
- Perform speed control of AC and DC motors by using solid state devices
- Detect the faults and troubleshoot inverter, stabilizer, battery charger, emergency light and UPS etc
- Plan, assemble and install solar panel
- Erect overhead domestic service line and outline various power plant layout
- Examine the faults and carry out repairing of circuit breakers.

Assessment criteria

The term assessment criteria specify how the student performance in respect of the trade's learning outcomes are to be recognised.

They are statements which specify the standards that must be met and what evidence will be taken to show achievement of learning outcomes.

For each trade learning outcome with assessment criteria is given in the trade syllabus.

For example the assessment criteria for electrician trade (1st semester) is given below.

Electrician trade - Generic learning outcome with assessment criteria

Learning outcome	Assessment criteria
1 Apply safe working practices	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy. 1.2 Recognize and report all unsafe situations according to site policy. 1.3 Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures. 1.4 Identify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements. 1.5 Identify and observe site policies and procedures in regard to illness or accident. 1.6 Identify safety alarms accurately. 1.7 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures. 1.8 Identify and observe site evacuation procedures according to site policy. 1.9 Identify Personal Productive Equipment (PPE) and use the same as per related working environment. 1.10 Identify basic first aid and use them under different circumstances. 1.11 Identify different fire extinguisher and use the same as per requirement.
2 Comply environment regulation and housekeeping	2.1 Identify environmental pollution & contribute to the avoidance of instances of environmental pollution. 2.2 Deploy environmental protection legislation & regulations 2.3 Take opportunities to use energy and materials in an environmentally friendly manner. 2.4 Avoid waste and dispose waste as per procedure 2.5 Recognize different components of 5S and apply the same in the working environment.
3 Interpret & use company and technical	3.1 Obtain sources of information and recognize information. 3.2 Use and draw up technical drawings and documents. 3.3 Use documents and technical regulations and occupationally related provisions. 3.4 Conduct appropriate and target oriented discussions with higher authority and within the team. 3.5 Present facts and circumstances, possible solutions &use English special terminology. 3.6 Resolve disputes within the team. 3.7 Conduct written communication.
4 Demonstrate basic mathematical concept and principles to perform practical operations.	4.1 Solve different problems like phase angle, etc. with the help of a calculator. 4.2 Demonstrate conversion of Fraction to Decimal and vice versa. 4.3 Explain BCD code, conversion from decimal to binary and viceversa, all other conversions.

Learning outcome	Assessment criteria
5 Understand and explain basic science in the field of study including simple machine.	5.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction. 5.2 Explain levers and its types. 5.3 Explain relationship between Efficiency, velocity ratio and Mechanical Advantage. 5.4 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials. 5.5 Solve simple problems on lifting tackles like crane-Solution of problems with the aid of vectors.
6 Read and apply engineering drawing for different application in the field of work.	6.1 Read & interpret the information on drawings and apply in executing practical work. 6.2 Read & analyse the specification to ascertain the material requirement, tools and assembly/maintenance parameters. 6.3 Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
7 Understand and apply the concept in productivity, quality tools, and labour welfare legislation in day to day work to improve productivity & quality.	7.1 Explain the concept of productivity and quality tools and apply during execution of job. 7.2 Explain basic concept of labour welfare legislation, adhere to responsibilities and remain sensitive towards such laws. 7.3 Knows benefits guaranteed under various acts.
8 Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	8.1 Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution. 8.2 Explain standard procedure for disposal of waste.
9 Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	9.1 Explain personnel finance and entrepreneurship. 9.2 Explain role of various schemes and institutes for self employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies/ programmes, procedure & the available scheme. 9.3 Prepare a report to become an entrepreneur for submission to financial institutions.
10 Utilize basic computer applications and internet to take benefit of IT developments in the industry.	10.1 Explain the basic hardware of personal computer. 10.2 Use common application software viz., word, excel, power point etc., in day to day work. 10.3 Awareness about useful internet websites, search relevant information pertaining to the assigned tasks.

Electrician trade - Specific learning outcome

Learning outcome	Assessment criteria
	Semester - I
11 Prepare profile with an appropriate accuracy as per drawing.	11.1 Identify the trade tools; demonstrate their uses with safety, care & maintenance. 11.2 Prepare a simple half lap joint using firmer chisel with safety. 11.3 Prepare tray using sheet metal with the safety. 11.4 Demonstrate fixing of surface mounting type of accessories. 11.5 Perform connections of electrical accessories. 11.6 Make and wire up of a test board and test it.
12 Prepare electrical wire joints, carry out soldering, crimping and measure insulation resistance of underground cable.	12.1 Observe safety precaution during joints & soldering. 12.2 Make simple straight twist and rat-tail joints in single strand conductors. 12.3 Make married and 'T' (Tee) joint in stranded conductors. 12.4 Prepare a Britannia straight and 'T' (Tee) joint in bare conductors. 12.5 Prepare western union joint in bare conductor. 12.6 Solder the finished copper conductor joints with precaution. 12.7 Prepare termination of cable lugs by using crimping tool. 12.8 Make straight joint in different types of underground cables. 12.9 Measure insulation resistance of underground cable.
13 Verify characteristics of electrical and magnetic circuits.	13.1 Identify types of wires, cables and verify their specifications. 13.2 Verify the characteristics of series, parallel and its combination circuit. 13.3 Analyze the effect of the short and open in series and parallel circuits. 13.4 Verify the relation of voltage components of RLC series circuit in AC. 13.5 Determine the power factor by direct and indirect methods in an AC single phase RLC parallel circuit. 13.6 Identify the phase sequence of a 3 ø supply using a phase sequence meter. 13.7 Prepare/ connect a lamp load in star and delta and determine relationship between line and phase values with precaution. 13.8 Connect balanced and unbalanced loads in 3 phase star system and measure the power of 3 phase loads. 13.9 Make the solenoid and determine its polarity for the given direction of current. 13.10 Group the given capacitors to get the required capacity and voltage rating.

Analysing the Syllabus - Break up of syllabus and schedule of instruction with time duration

Objectives: At the end of this lesson you shall be able to

- **define syllabus**
- **state necessity of analysing syllabus**
- **explain the steps involved in analysation of syllabus**
- **brief the methods of syllabus analysing**
- **state the advantage of syllabus analysation**
- **steps in breaking up of syllabus**
- **prepare schedule of instruction with the duration.**

Syllabus

A syllabus is usually no more than list of topics to be covered in a course.

There is an unlimited area of work woven around every trade. To determine the objective of trade training depends upon the

- need
- time
- facilities available

An outline of the course called 'syllabus' to be prepared in consolation with the trade experts for the development of specific knowledge and skills required by an occupation.

The outline of the course are divided in to three parts

- **First part**

Trainee should deal with a fundamental training course covering generally the one - sixth of the total training period.

- **Second part**

Trainee should acquiring of an adequate degree of skills, covering generally two thirds of the total training period.

- **Third part**

Should deal with the intensive aspects of the practical training. On completion of the extensive practical training course in the training centers, under close guidance and should under the supervision of the trainees. This should cover one sixth period of training.

Syllabus is directly responsible for bringing the objectives of the curriculum in to action.

Curriculum : Curriculum is defined as the course of study offered by an institution. It systematically describes the goals planned, objectives, and content, learning activities for a specific timeframe, place tools, and evaluation procedures. Curriculum is planned in terms of a framework of theory and research or past and present professional practice.

Curriculum covers all the activities and arrangements made by the institution throughout the academic year to facilitate the learners and the instruction.

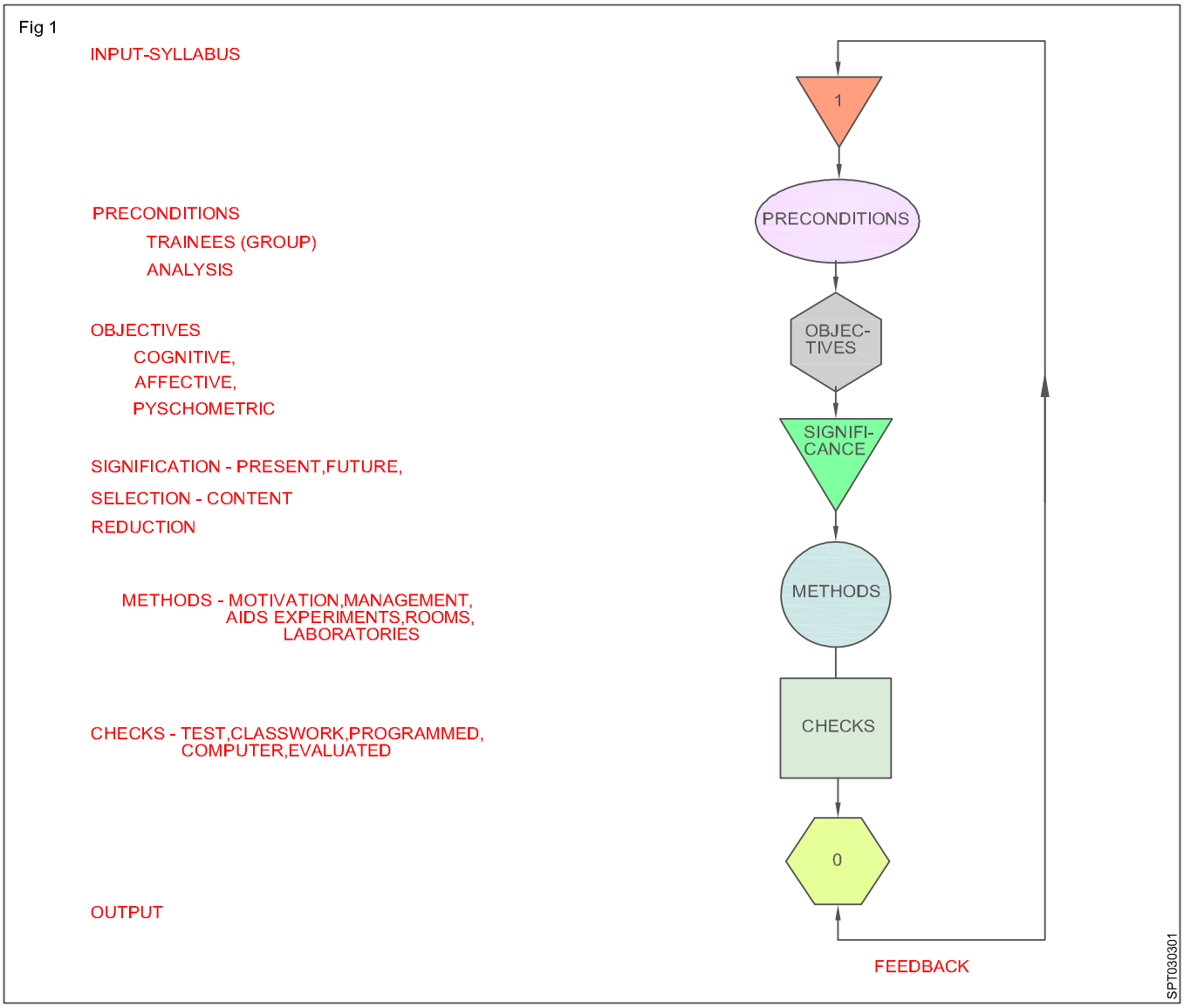
Necessity of analyzing syllabus

- To weed out unnecessary information.
- To concentrate on the essentials of the job.
- To teach from simple to complex.
- To prepare instructional material
- To teach in a logical instructional sequence

Syllabus Analysis: Analyzing a syllabus is important in order to find out the sequence of topics to know what to teach, when to teach and how much to teach. If an instructor begins her teaching after analyzing the syllabus, the training programme can be imparted effectively without any confusion.

The given model (Fig 1) indicates that for a INPUT-syllabus for any course the trainees are to be defined with concrete analysis of the pre-requisites for the trainees; the objectives are to be stated with all clarity, objectivity and explicitly with sufficient enumeration on how much knowledge attitude and skills are to be involved; the appropriate values of the topics in the syllabus which have significance both for the present and future. This particular factor alone would guide for selection of the contents and help in the reduction of such topics found to be unproductive. Such selection of contents would necessarily lead the instructor to the selection of methods and media for the topics to be delay in. The tested and test results would then eventually indicate the effectiveness of the syllabus. The feedback information would thus be organised for follow-up actions to be taken for revision / the syllabus, if necessary.

Fig 1



The instructor should be critical in analysing the syllabus and thus take into account these factors and bear in the mind that anything that can be taught and can be learned, can also be broken down into elements so that instruction can start from the simple or easy and gradually develop and progress to the complex or difficult. Anything, we observe as a whole and complete is composed of small parts and are built up or developed to become the whole or complete. Similarly in the training of craftsmen and the development of complex skills it is essential that the skills are broken down so that learning can start from the simple and easy skills and progress towards the more difficult and complex ones. This is the only logical and correct method of imparting training. The process of breaking down the skills of the trade to enable to obtain a satisfactory sequence for instructional purpose is called analysis.

Method of syllabus analysation

There are many methods of analysing the syllabus. The major and vital consideration in selecting the method being the purpose for which training is organised.

A Job analysis method

If we are training for the satisfactory performance of specific job or if we are imparting on the job, the job analysis method would be a suitable one. By a proper breaking down the job into their different elements which are also called skills or operations and re-arranging the jobs in accordance with the order of difficulty from simple to difficult, an instructional sequence could be obtained. This would be satisfactory starting point. Job here means a completed piece of work (or) work-job as against job for which we get paid or payroll job.

B Skill analysis method

Another method would be to list all the skills or operations in which proficiency is desired and again re-arrange them according to the order of difficulty and also according to the order of applications. Then select and decide activities or experiences to develop the skills in the order. In any method it has to be borne in mind that it is not the job that is important but the skill developments in the learner. What the job does to the learner is more important that what the learner does to the job.

For analyzing a given syllabus, following steps are to be followed:

- Study and understanding the syllabus
- Prepare a list of all basic and advanced skill of the trade
- Prepare a list of theoretical and practical job to be completed during the course
- Arrange the topics from simple to complex dividing into modules and units
- Calculate time required to complete the syllabus in hours
- Distribute hours for each activity depending upon its complexity
- Prepare master schedule
- Prepare time table, monthly schedule and weekly schedule
- Prepare instructional material for each lesson

Advantages of syllabus analysis:

- After analyzing the syllabus, Instructor understands what exactly has to teach, collect proper information and prepare well.
- Training materials can be prepared well in advance.
- Training programme will be completed within the prescribed time.
- Learners can be aware about the teaching activity and get confidence.
- It helps to maintain logical and psychological sequence.
- The teaching activity proceeds in a definite direction.
- It assists in achieving the aim and objectives of the course.
- The success of a training programme is assured.

Break up of syllabus and schedule of instruction with time duration.

Break up syllabus is forming the modules with relevant group of skills /area with time duration after analysing the syllabus.

Schedule of instruction is to provide a planned schedule for the various day to day instructional activities depending on the requirement of the practical exercises to be done as per trade practical book.

This schedule is prepared for 26 weeks each week consisting of 5 actual working days.

In order to develop the occupation specific professional competencies of the learners, the instructor has to impart the theoretical knowledge required to perform the set of skills in the particular trade. For this purpose, the instructor has to analyse the syllabus and prepare the list of graded exercises with different complexity levels in a simple to complex skill sequence.

With the split up of syllabus the instructor has to prepare the topics arranged in an order to implement with appropriate date and time allotment for lessons and demonstrations.

The pictorial representation shown in Fig 2 depicts the step by step activities required to be taken by the instructor to prepare the information sheet, select or prepare the appropriate teaching aids to accompany the lesson plan.

For example the trade syllabus of Electrician (table 1) 1st semester (NSQF-5) consist of 14 exercise for week no 1,2, & 3 under safety practice - hand tools module (75 hrs) for that the schedule of instruction is prepared and shown in the table 2 (for 1st week).

Fig 2

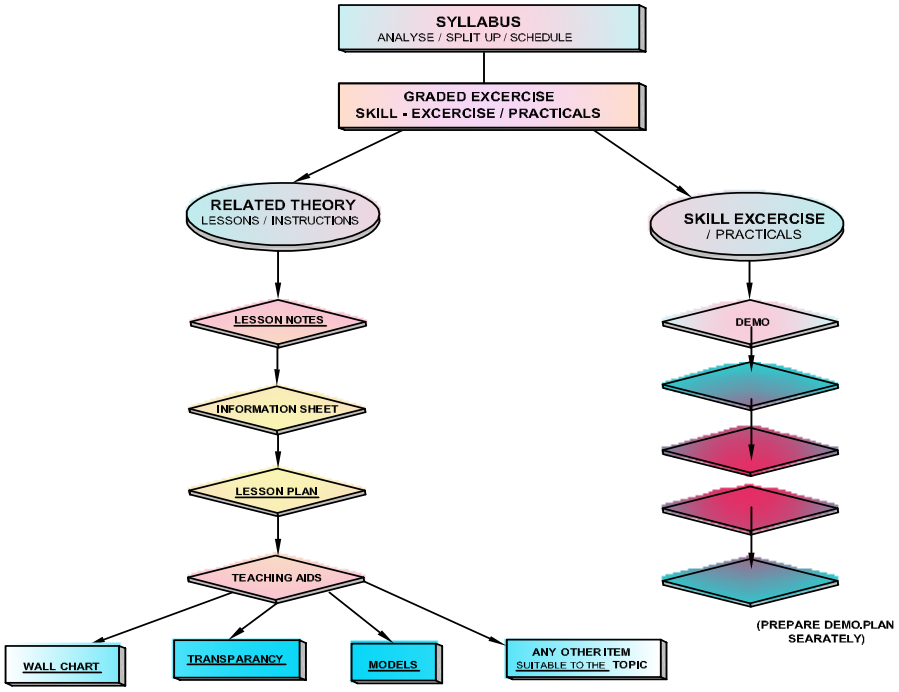


Table 1

SYLLABUS FOR ELECTRICIAN TRADE			
FIRST SEMESTER – 06 Months			
Week No.	**Reference Learning outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
1	• Apply safe working practices	1 Visit various sections of the institutes and location of electrical installations. (05 hrs) 2 Identify safety symbols and hazards. (05 Hrs) 3 Preventive measures for electrical accidents and practice steps to be taken in such accidents.(05 hrs) 4 Practice safe methods of fire fighting in case of electrical fire. (05 hrs) 5 Use of fire extinguishers. (05 Hrs)	Scope of the electrician trade. Safety rules and safety signs. Types and working of fire extinguishers.
2	• Apply safe working practices • Comply environment regulation and house-keeping	6 Practice elementary first aid. (05 hrs) 7 Rescue a person and practice artificial respiration. (05 hrs) 8 Disposal procedure of waste materials.(05 Hrs) 9 Use of personal protective equipments.(05 hrs) 10 Practice on cleanliness and procedure to maintain it. (05 hrs)	First aid safety practice. Hazard identification and prevention. Personal safety and factory safety. Response to emergencies e.g. power failure, system failure and fire etc.
3		11 Identify trade tools and machineries. (10 Hrs) 12 Practice safe methods of lifting and handling of tools & equipment. (05 Hrs) 13 Select proper tools for operation and precautions in operation. (05 Hrs) 14 Care & maintenance of trade	Concept of Standards and advantages of BIS/ISI. Trade tools specifications. Introduction to National Electrical Code-2011.

Semester : 1
Week No : 1

Table 2

SCHEDULE OF INSTRUCTION

Trade : Electrician
Safety Practice and Hand Tools
Name of the Instructor :

Day	Date/ Hrs	Exercise No. & name	Demonstration	Shop talk	Classroom lessons	Remarks
1	5	Ex.No.1.1.01 visit various section of the institutes and locations of electrical installations	Arrange the visit to the various section of workshop, classrooms. Instruct and guide the trainees to prepare and draw the layout of electrician section including switches etc.	Introduction to skill/ vocational scheme Introduce to structure of organisation/ITI Preparation of layput	Organisation of ITI's	R.T 1.1.01
2	5	Ex.No.1.1.02 identify safety symbols and hazards	Explain the road safety, traffic police signal. Show the safety sign chart and explain the type and uses of signs.	Brief about road safety Accident - causes - necessity of signs	Safety rules Safety practice	R.T 1.1.02
3	5	Ex.No. 1.1.03 Preventive measure for electrical accidents and practice steps to be taken in such accident	Rescue victim from electric contact. Prepare the victim for artificial respiration.	Necessity of first aid application of each method. Effect of cardiac arrest and treatment. Treatment for bleeding	Basic first - aid treatment	R.T 1.1.03

Week No : 1

Trade : Electrician
Safety Practice and Hand Yools

Day	Date/ Hrs	Exercise No. & name	Demonstration	Shop talk	Classroom lessons	Remarks
4	5	Ex.No.1.1.04 Practice safe methods of fire fighting in case of electrical life.	Operate the fire extinguisher	Classification of fires fire extinguisher. Types of extinguisher for electrical fires.	Safety practice extinguisher	R.T 1.1.04
5	5	Ex.No. 1.1.05 Use of fire extinguisher	Selection of fire extinguisher Operation of fire extinguisher extinguishing the fire	Types of extinguisher for various types of fire	Method of using various types of fire extinguisher	R.T. 1.1.05

ADDIE model of instruction

Objectives: At the end of this lesson you shall be able to
- **define ADDIE**
- **explain the ADDIE model of instruction.**

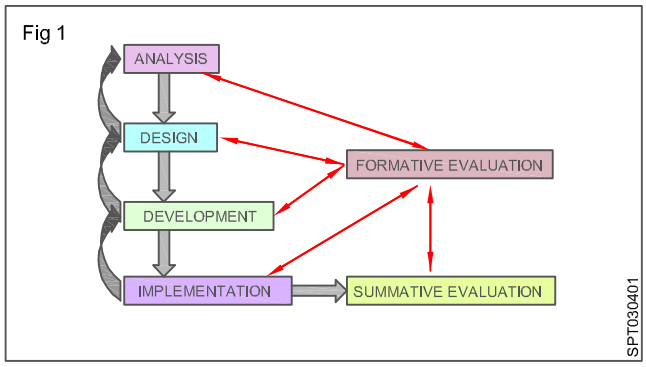
ADDIE

ADDIE is an instructional systems design (ISD) frame work that many instructional designers and training developers use to develop courses.

ADDIE is a project management tool that helps to co-ordinate the various steps in course and instructional design technology

Instructional design is the systematic approach to the Analysis, Design, Development, Implementation and Evaluation of learning materials and activities. (Fig 1)

Fig 1



i Analysis phase

The analysis phase clarifies instructional problems and objectives, and identifies the learning environment and learner's existing knowledge and skills. Questions the analysis phase addresses include;

- Who are the learners and what are their characteristics?
- What is the desired new behavior?
- What types of learning constraints exist?
- What are the delivery options?
- What are the pedagogical considerations?
- What adult learning theory considerations apply?
- What is the timeline for project completion?

The process of asking these questions is often part of a needs analysis. During the needs analysis instructional designers (IDs) will determine constraints and resources in order to fine tune their plan of action.

ii Design phase

The design phase deals with learning objectives, assessment instruments, exercises, content, subject matter analysis, lesson planning, and media selection. The design phase should be systematic and specific. Systematic means a logical, orderly method that identifies, develops, and evaluates a set of planned strategies for attaining course content. Specific means execute each element of the instructional design plan with attention to detail. The design phase may involve writing a design document/design proposal or concept and structure note to aid final development.

iii Development phase

In the development phase, instructional designers and developers create and assemble course content described in the design phase. If e-learning is involved, programmers develop or integrate technologies.

Designers create storyboards, materials and procedures. The designer reviews and revises the course content according to feedback.

iv Implementation phase

The implementation phase develops procedures for training facilitators and learners. Training facilitators cover the course curriculum, learning outcomes, method of delivery, and testing procedures. Preparation for learners includes training them on new tools (software or hardware) and student registration. Implementation includes evaluation of the design.

v Evaluation phase

The evaluation phase consists of two aspects: formative and summative. Formative evaluation is present in each stage of the ADDIE process, while summative evaluation is conducted at the end of their course. Donald Kirkpatrick's Four Levels of Learning Evaluation are often utilized during this phase of the ADDIE process.

These phases sometimes, overlap and can be inter related; however, they provide a dynamic, flexible guideline for developing effective and efficient instruction (Table 1)

Table 1

	Sample Tasks	Sample output
Analysis the process of defining what is to be learned	• Learner profile • Problem identification • Task analysis	• Learner profile • Description of constraints • Needs, problem statement • Task analysis
Design the process of specifying how it is to be learned	• Written objectives • Develop test items • Plan instruction • Identify resources	• Measurable objectives • Instructional strategy • Prototype specifications
Development the process of authoring and producing the materials	• Work with producers • Develop workbook, flowchart Program	• Storyboard • Script • Exercises • Computer assisted instruction
Implementation the process of installing the project in the real world context	• Teacher training • Tryout	• Student comments, data
Evaluation the process of determining the adequacy of the instruction	• Record time data • Interpret test results • Revise activities	• Recommendations • Revised prototype

UNIT - IV

PLANNING FOR INSTRUCTION

Learning Outcomes to be achieved from this unit:

- **Use questioning technique effectively.**
- **Plan and prepare the instructional material required for imparting training**

Principles of Teaching Planning for Instruction

Theory 4.1

Lesson plan

Objectives: At the end of this lesson you shall be able to

- **explain what is lesson plan and its necessity for teaching/training**
- **List the advantages of lesson plan**
- **analyse the four step method followed for vocational Training (Craftsman Training System)**
- **explain the elements in all the four steps of lesson plan format**
- **define instruction, objectives**
- **explain instructional objectives/behavioural objectives**
- **list the verbs (action words) used to write as objectives for specific kind of learning outcomes**
- **list the key points for lesson plan preparation.**

Introduction

Lesson plan is the guidance plan for the Instructor. It is like a roadmap on a journey to reach a destination with the help of lesson that he can conduct classes and teach his subject in a sequential / methodical manner, thereby making it easy for the learner to understand and maintain interest and attention. It is actually a plan for action, and it contains the important information to be imparted about a lesson (subject) in the class and other activities to be followed during the presentation step. Careful planning is the foundation of all good teaching and learning activities.

Necessity of planning a lesson

- Since the Instructor has to teach the prescribed course, if there is no planning he cannot teach the entire course content in time. It is therefore necessary to plan a lesson.
- The Instructor has to achieve some definite results by teaching. If a lesson is taught according to lesson planning, the teacher can teach well.
- Teaching in an improper manner will not bring the desired results. If no aim is fixed, it will be useless to teach a lesson.
- When a teacher/trainer is prepared to teach a lesson, he enters the class with some definite aim.
- He is self confident that he will teach a lesson well he need not depend on his memory.
- He is also prepared to face the learners and answer their probable questions.
- He is able to solve any problem regarding the lesson to be taught.
- He finishes the lesson according to the plan in the prescribed time and schedule.
- It is therefore very much necessary to plan a lesson. In this way, much teaching can be done in time.

Advantages of Lesson plan

The following are the main advantages of lesson plan

- Organization of the subject.
- Much time saved.
- Work is done in a planned manner.
- Selection and utilization of suitable teaching aids properly.
- Unnecessary teaching is avoided.
- Suitable atmosphere is created.
- Lesson plan form the 'record of teaching - learning activity'

Organization of the subject

- By lesson planning, the instructor knows what he has to teach and how he has to teach. He selects the suitable subjects and lessons for teaching; lesson plan serves to organize the whole activity in a smooth way.

Much time saved

- The Instructor knows what he has to teach in a class. He teaches only that much to the learners in the class. He teaches necessary things only. He does not teach what is not necessary. In this way the teacher teaches much in less time. Also unnecessary teaching is avoided which saves instructional time. Thus, much time is saved.

Work is done in a planned manner

- The Instructor begins a lesson in a suitable manner. He develops the lesson in a planned manner. He asks the trainees to do oral or written work in a planned way. The Instructor divides his time according to the needs of the trainees. He is also able to examine the work done by the trainees. All work is finished according to the plan.

Selection and use of teaching aids

- In order to create multi sensation to the learners to understand the importance of the lesson the instructor plans, prepares or selects suitable teaching aids and utilizes them at appropriate situations by making spot hints on the lesson plan itself.

Unnecessary teaching is avoided

- If teaching is done without any plan, there are chances that the teacher may teach unnecessary things to the trainees. If there is a lesson planning, the Instructor teaches the necessary things only.

Suitable atmosphere is created

- By lesson planning, the instructor creates a suitable atmosphere for teaching and learning. The trainees learn the lesson, which is taught to them in a period. The trainees know that they have learnt the lesson in a fixed period. So that they learn it well.

Lesson plan forms a record of teaching learning activity

- All the instructors are expected to carryout the teaching activity effectively for each session. Therefore, once prepared lesson plan for a batch is preserved as a permanent record of teaching - learning activity. Depending upon the changes in syllabus if any, the content can be modified as and when required.

Four step method

Today the standardized system, being followed in the field of vocational training, is called as the four step method. It is originated from the German Philosopher and Educationist Herbert. He gave new ideas about teaching method.

Herbert's ideas were later on put into use for teaching technical subject as the following four step method

- Preparation (introduction / why.)
- Presentation (development/ demonstration.)
- Application (recapitulation / imitation.)
- Test/evaluation (Consolidation / repetition)

Thereafter in Germany, USA, and other advanced countries the above Four Step method has been followed. Today this method is considered as one of the effective methods for skill training. Now let us go in detail about what exactly to be considered by each step of this method.

Preparation

This step includes both Instructor preparation as well as trainee's preparation.

Preparation of Instructor: In this step instructor has to prepare him (self), lesson plan (or demonstration plan) for using at the time of presenting the theoretical knowledge (or practical skill). While planning a lesson the instructor should follow certain points as given below:

a Title of the lesson.

b Specific teaching objectives.

c Preparation of teaching aids.

d Review of previous lesson.

e Appropriate motivation.

f Choosing of teaching method.

g Planning for trainee's participation.

h Time and feedback activities.

i Proper summarizing

i Assignment and test.

The Instructor should also prepare other important items such as teaching aids, wall chart / transparency, models /actual object, written instructional material etc.

Arrangement of classroom (Workplace)

Besides planning of the lesson, preparation of the classroom (or workshop) where lesson will be conducted is also necessary for a successful teaching. For preparation of the classroom the following points are to be considered:

a **Seating:** There should be adequate number of seats and the same should be arranged properly so that the instructor can supervise learner.

b **Lighting and ventilation:-** Suitable and adequate lighting and ventilation should be arranged for the entire class room space.

Layout

Layout of the demonstration bench and their positioning should be done properly. Thus the trainees get maximum visibility while attending the demonstration.

Equipment and materials

The equipment and materials which are necessary for conducting the class should be arranged before hand. This will also be included under the teaching aids.

Removal of distracting items

The items which are distracting, i.e. irrelevant to the lesson, such as unwanted charts, chalk board reading, pieces of equipment for future lesson should be removed from the classroom Otherwise, attention of the trainee may be diverted.

Safety equipment

The instructor should see that the safety equipment is ready and serviceable because the safety of trainees and equipment is full responsibility of the Instructor.

Trainee preparation

Before any new information (knowledge) is being given to the trainees, the instructor has to prepare trainee's mind to receive the new information. There is a principle which states that, unless the learner is ready to learn he will never learn. So the Instructor has to make ready the learner's mind before giving any new information.

For this, the instructor has to motivate and review the previous lesson and then he can tell the importance of application of new information to be learnt by them. In this step, the Instructor has to apply the Laws of learning such as the Law or readiness and the Law of purpose. It is therefore, considered absolutely essential to make all necessary preparations before teaching a new lesson.

Step 2: Presentation

After the trainees are prepared to receive the lesson, the subject is taught. According to this step, care should be taken to present the subject before the trainees in a logical, systematic, and effective way.

The instructor should begin teaching a lesson slowly after giving an introduction of the lesson, and after associating with the subject or lesson already taught. the Instructor should explain the difficult subject and objective so that the trainee may not feel any difficulty in understanding the lesson.

The instructor should use very simple language in teaching the subject. The subject should be divided into several objectives and each objective explained thoroughly. If the whole subject is taught as one, it will be difficult for the trainees to understand it in detail.

The instructor should tell about the subject which is proposed to be taught and then explain or teach about the various aspects of the matter in greater detail. This will enable the trainees to learn well.

The instructor should ask questions from the trainees in order to know whether the trainees understand the lesson being taught. If the subject is presented to the trainees, but if the trainees do not understand it, then it will be useless to teach. The Instructor should therefore find out by asking questions or through some other means whether the trainees understand the lesson being taught.

During this step the following points should be kept in mind

- Follow the lesson plan.
- Develop the topic in a logical order.
- Make use of the teaching aids such as wall charts, models, actual objects, chalk board, and other audio-visual aids effectively.
- Use questions to

a stimulate the learner's thinking - (introductory review questions)

b Check the understanding and to develop the subject (Development questions)

c Encourage the learner to ask questions (application questions)

Step 3: Application

When the trainees have attained some knowledge in the manners stated above it is necessary that they should use/apply that knowledge in their practice. The trainees attain theoretical knowledge by learning in the above manner. But, that knowledge is considered to be incomplete unless it is put into practice. So according to this step, the trainees have to practice the theoretical knowledge gained and then make that knowledge permanent. The instructor should give chance to the trainees to use and put their knowledge in actual practice.

The instructor has to ask certain questions from the subject matter dealt/taken in the class. He has to guide, correct, and encourage the learners in telling the correct answer for the questions. In this step, the instructor has to apply the Law of exercise for the perfect knowledge or skill attainment. After completion of question answer session, the instructor has to summarize all the points - but, emphasizing the key/ important points only.

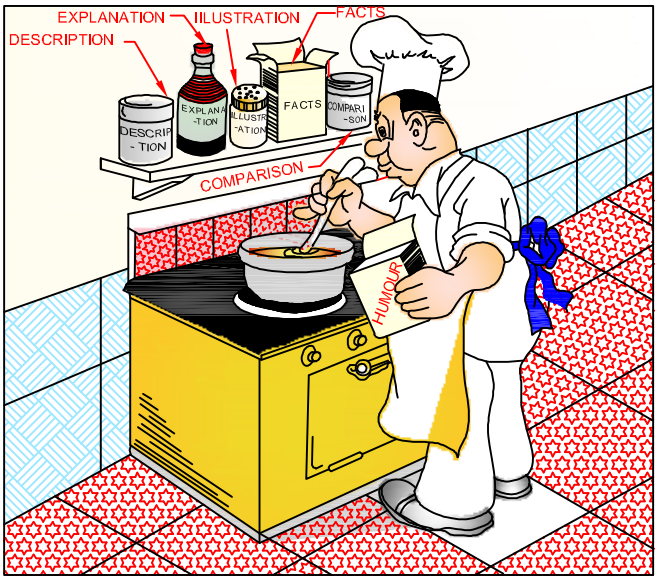
Step 4: Test

This is the step at which the effectiveness of learning will be measured. Teaching will be completed when test is conducted. The result of this step will help the Instructor to decide whether his teaching was effective or not.

Test can be conducted by giving/assigning questions out of the subject matter covered in the class. During this step the learners will answer to the questions comprehensively by written answers, drawing diagrams, also solving problems as their own that is without anybody's help.

This is the only way by which the learner knows his ability and develops confidence in the subject. (Skill test can be conducted by performance/ practice so as to grade the achievement of the learner in this step). The instructor has to apply the Law of satisfaction by which they will get interest for further learning. The validity, reliability and objectivity should be observed while constructing and conducting the test.

At the time of planning and preparing the lesson plans, the instructor has to include the facts, descriptions, explanations, comparisons, Illustrations about the subject matters as well as humour also in the proper proportion like the same way a cook prepares a delicious food (Fig 1)



The specimen lesson plan format being utilized for vocational training is shown below, in which all the four steps of activities and preparations to be made by the Instructor are explained in the following paragraphs.

The detailed description of all the elements of Lesson Plan format is explained below

The major components of 4 step of a lesson plan are

- Preparation step
- Presentation step
- Application step
- Testing step

Elements in the four steps of lesson plan format

Step 1: Preparation

Title

This indicates the name (core idea) of the lesson clearly

Objectives

There are some specific purpose for teaching a lesson which we call objectives. These should be clearly stated in terms of what the learner is expected to learn from this lesson. In each, there may be about 3 or 4 closely related objectives. If the objectives are more, the chances are that the matter to be covered may be too much for the learner and if the objectives are too few there may not be sufficient material for the learner to be interested in during the period of 45 minutes to 60 minutes normally.

Teaching Aids

Learning becomes easier, interesting and deeper, when multiple senses of the learners are employed/involved. Further, in the training of craftsmen, the instruction is almost always on matters such as tools, materials, machines and processes all of which can be depicted through the actual objects, or through charts, models, films, film strips, slides, or by other manner which would help the learner to see besides listening to the instructor. Such items that the instructor has selected, prepared and planned to use in the class to help the presentation and aid the learning of the lesson are listed here. The instructor will see that all these items are available and ready in the class for use before the class assembles.

Introduction

This is the stage at which the learners are prepared for the lesson of the day. There are five types of introduction as

- Revisionary or review
- Anecdote
- Analogy
- Topical
- Shock

Method of introducing the new lesson in the class must be written briefly. Depending on the subject matter of the lesson and its relation to previous lesson, you have to use this as a link between the known to unknown . It is the stage that effective motivation is done to in the learner and keen desire to the new lesson. Introduction does not have to be a long one. A few relevant points properly developed with realistic examples, which the learner can understand would serve the purpose. The success or failure of the presentation of a lesson would be a large extent depends in the manner in which the introduction to the lesson or preparation of the learner is done. Under review and motivation only brief notes are to be written in the lesson plan with the help of which you should be in a position to explain while presenting the lesson.

Review

The fact that the learners are physically present in the class does not necessarily mean that they are mentally ready to receive your presentation. Before teaching a new lesson to the class, you should make the learners to be ready or prepared to receive, the new lesson. As part of the preparation, one of the first things you have to do in a class is to discuss the important topics of the previous lesson. Here you have to write some small questions about the previous lessons to make sure that the learners have remembered what you taught in the previous class. You may tell the importance of present lesson with previous lesson by linking the main points. If the lesson is a first lesson in a class, in that case instead of linking, discuss about the relevant knowledge gained by the learners.

LESSON PLAN

Name .....**Adm No**.....**Unit No**.....**Lesson No.**.....

Trade......**Date**..... **Time.**.....

I Preparation

1 **Title :** .....

2 **Objectives :** At the end of this Lesson the trainee shall be able to

a .....

b .....

c .....

d .....

3 **Aids :** .....

.....

4 **Introduction :**

i **Review :**

ii **Motivation :**

II Presentation (Lesson) :

Topics	Information points	Spot hints

Topics	Information points	Spot hints

III Application:

a

b

c

d

Summary:

IV **Test:**

Assignment:

a

b

c

Next Lesson :

Motivation

Motivation is creating willingness. As an instructor, you must create interest and willingness in the minds of learners to learn the new lesson. Method of creating interest in the minds of learner to learn the new lesson must be written briefly.

Topics

The important points of the lesson as planned are to be developed with catch words written clearly so that you can refer and pickup at a glance. Complete sentences need not be written. Write selected topics according to the lesson to be taken so as to reach the aim or fulfill the objectives of the lesson. This has to be written in sequential order.

Information points

Use key words and catch words of points only to be written like telegraphic message. Write the must know information of each topic properly . Information may be written in codes, symbols and abbreviation reference to the objectives and topics as convenient/familiar.

Spot hints

You need to enter spot hints in the appropriate place. Write hints such as codes, symbols or simple diagrams to attract the learner's attention and make the instruction as effective as possible. Hints can be given through charts, models or abbreviations that can make you convenient or familiar, that your efforts are directed towards better teaching. For instruction at a particular stage of development of the lesson a chart is to be shown, may be indicated as "w/c" or "c" and asking a question by "A/Q" or '?' as key word as the entire plan is made and used by you in the presentation stage. Display of teaching aids in an appropriate time is very important.

Application

Learning takes place only when the learner has an opportunity to apply the acquired knowledge to various situations. Necessary time for applications of knowledge may not be available in the class during presentation. Hence the manner in which such opportunities are provided in respect of the subject matter covered in the lesson must be stated in the application stage. Ask simple and direct questions related to the topics. This is an opportunity for the learners to answer the questions and showing their level of understanding. You may clarify the learners doubt. Interact with them. After questioning, remember to receive the answer (yes, yes, nodding your head, etc) Reward the answer (good, very good, etc), and repeat the answer.

In practical demonstration, the instructor has to ask the learners to initiate the steps followed during the demonstration. Write simple questions to make the learner to involve in that particular activities.

Summary

After the above steps and interaction, you may feel good that your learners followed your instruction, and understand the lesson. Now this is a time to sum up all the important topics of the lesson taught in the class. In the summary time, you must emphasise and reinforce the points, which are important to the lesson. Main topics of the lesson may be written under summary or you can recapitulate the main points of the lesson.

Test

At this step, comprehensive questions about the lesson taken should be asked to the learners. This can be done either by oral or in written form.

Assignment

Series of questions about the lesson already taken are to be written under assignment. Related problem, exercises, drawing of sketches including various types of questions like objective and subjective types can be given as separate assignment sheet.

Next lesson

Title of the next lesson to be taken has to be mentioned under this heading. A brief insight into the next lesson must be given to help the learners to think ahead of the subject and make them to understand better.

- Hints
- Developing questions
- Display of teaching aids in appropriate time

Learner's activities such as active participation, interaction, question and answer.

Summary it is an opportunity for you to wrap up the discussion.

Test to know the effectiveness of teaching and the understanding level of the learners.

Assignment include objective and subjective type of questions.

Reference materials information book name and author's name.

Topic for next lesson

Feedback

Instruction

It is a goal directed teaching process which is pre-planned. It is always necessary to identify the pre-determined goals and objectives to be achieved.

Instructional objective

It is the description of the form of the behaviour that instruction is to produce, stated in terms of what the trainee (learner) is to be able to perform (do-explain, describe, discuss, solve) the conditions under which the action is taken and where appropriate, a standard of accuracy or speed. The behaviour described or its consequences should be observable and measurable.

Objectives direct attention to the learner and the types of behaviour they should exhibit. Sometimes these statements are called behavioural objectives.

Objective is a point which one aims at reaching after a certain amount of learning experience. Clearly defined objectives would not only help the teachers and learners to understand what exactly they are supposed to do, but also provide the means for evaluating their own achievements. The statement of objectives is therefore expected to be specific, measurable, achievable, realistic & time bound (The 'SMART approach') and presented in operational terms.

Ambiguous statements of objectives

While writing the objectives, statements that are not clear, vague must be avoided.

When clearly defined objectives are lacking, there is no sound basis for the selection or designing of instructional materials, content, or methods.

Instructional objectives describe the skills, knowledge, abilities or attitudes learners should posses or demonstrate after they complete the training. the starting point for designing a course of study should include these instructional objectives; the objectives determine the intended outcomes of the training. Good instructional objectives describe an observable performance, one that can be observed and measured by an instructor. In a nutshell, instructional objectives:

- Describe a skill that learners are expected to posses after instruction
- Describe a measureable performance
- Describe the performance conditions

Instructional objectives are also called as learning objectives.

Instructional objectives - important tools

Instructional objectives are important tools in the training process, as the use of precisely stated objectives often determines the nature of training methods, media and process of testing. All learning activities are classified under acquisition of knowledge, development of skills, and modification of attitudes and habits.

We are generally concerned with development of skills, but we cannot segregate skill from knowledge and attitude. For effective implementation of the programme of training and in the context of instructional design, objectives play a very important role.

Objectives

An objective is a more restricted term in scope and its finality, and in this context of learning system, it is defined as the terminal behaviour or set of behaviours the instructional designer expects the learners to display as a result of training imparted to the learner. Statement of objectives must be regarded as a vital element in any instructional planning.

A trainee enters the training situation with a certain set of behaviours - which may even be nil - towards certain stimuli. As a result of training, he comes out with a difference i.e. behavioural change and this constitutes the result of training.

This difference is usually measured through pre - testing (given at the end of training activity). Thus the behavioural changes taken place is measured through - in terms of knowledge, attitude and psychomotor skills (muscular action).

Essential ingredients of instructional objectives

Learning is a process. This process of learning is mostly internal. The effect of learning is exhibited by changes in behaviour. We infer that the learning has taken place as a result of this changes of behaviour.

Thus, objectives or instructional objectives are stated in terms of external behaviour exhibited by the learner that are measurable.

Objectives are therefore useful to decide what to learn and what to measure, to find out how much has been learnt by the learner.

A training objective must be a clear, precise statement of what a learner will be able to do at the end of training (Instruction). They are far more than goals; and must be stated ingredients in instructional objectives. They are:

Performance

Statement of what a trainee should be able to do perform at the end of the learning session. (terminal behaviour)

Condition

The objective describes the condition under which a trainee should be able to perform the task to exhibit the terminal behaviour.

Standard

The standard to which he should be able to perform (the criteria) the skill. How well the task or behaviour must be performed to meet the standard.

An example of writing objectives

"The trainee should be able to find the square root of any number, using logarithm tables, and answers correct to three significant figures, nine times out of ten" - This is a precise statement, using unambiguous terms. This can be stated as the terminal performance that is measurable.

Many words represent either vague or ambiguous concepts and cannot be precisely measured. So, one should avoid using such words.

Ambiguous terms

Knows, understands, appreciates, grasps, enjoys, believes, have faith in etc.

Words which permit fewer interpretations

Writes, recites, indentifies, distinguishes, differentiates, solves, constructs, lists, enumerates, compares, contrasts, defines, states, recongizes, demonstrates, locates, labels, measures, categories, detects, operates, etc.

List of verbs (action Words) used to write as objectives

Related to specific kind of Learning

Specific responding

(Producing a single isolated response)

To associate	To define	To distinguish
To differentiate	To evaluate	To explain
To grasp (with hand)	To hold	To identify
To label	To lift	To locate
To loosen	To measure	To move
To name	To pick up	To place
To press	To pull	To push
To repeat	To reply	To respond
To rotate	To say	To set
To signal	To slide	To secure
To state	To tighten	To touch
To turn	To twist	

Motor chaining (producing a sequence of motion)

To activate	To adjust	To align
To close	To copy	To (dis) assemble
To (dis) connect	To draw	To duplicate
To draw	To insert	To load
To handle	To measure	To mix
To open	To operate	To prepare
To remove	To repair	To replace
To stencil	To service	To state
To tune	To turn-off	To dismantle

Verbal chaining (producing a sequence of words)

To cite	To copy	To enumerate
To letter	To list	To quote
To recite	To record	To reiterate
To repeat	To reproduce	To restate
To transcribe	To type	

Discriminating (identifying two or more stimuli)

To choose	To compare	To contrast
To couple	To decide	To detect
To differentiate	To distinguish	To isolate
To judge	To match	To pick
To select		

Classifying (using concept)

To allocate	To arrange	To assign
To catalogue	To categorize	To classify
To collect	To divide	To file
To grade	To group	To index
To inventory	To itemize	To order
To rank	To rate	To reject
To screen	To sort	To specify
To survey	To tabulate	

Rule using (using principles)

To anticipate	To calculate	To calibrate
To check	To compile	To compute
To conclude	To construct	To convert

To coordinate	To correct	To deduce
To define	To demonstrate	To design
To determine	To diagram	To equate
To estimate	To evaluate	To examine
To expect	To explain	To extrapolate
To figure	To generalize	To illustrate
To monitor	To organize	To plan
To predict	To prescribe	To program
To re-project	To schedule	To solve
To translate	To verify	

Key points for lesson plan preparation

- Refer to relevant materials that are WIM, Subject books, etc collect information points for the subject matter for the lesson.
- Decide suitable title for the lesson subject of your trade.
- Select appropriate specific objectives of the lesson with which you make your learners should be able to do certain definite activities after the lesson.
- Plan and decide your teaching steps/ method.
- Plan and prepare your information sheet, select/ prepare suitable teaching aids.
- Arrange the classroom (and demonstration) area in advance.
- Determine the review item of the previous class subject with respect to what you are going to teach the knowledge, facts by the current lesson.
- Prepare the motivating item appropriate to explain them and link the lesson what they are going to learn (objectives).
- Arrange all the key points in the logical order for learner's participation.
- Present the topics in sequence allowing for learner's participation.
- Plan lesson activity for learners (application), explain and guide them to ensure assimilation (questions, statements, discussions, problem solving etc ensure more time is used for this step.)
- Summarize the topic in sequence (questions and answers, chalk board summary).
- Check your "AIM" has been achieved and evaluate the result.
- Present the points to the learners with assistance to allow them to be perfect and attain the accuracy and also speed, you demand by practice.
- State your next lesson, and issue your information sheet or assignment sheet for further study or preparation for the next lesson.

Principles of Teaching Planning for Instruction — Theory 4.2

Questions & Questioning technique

Objectives: At the end of this lesson you shall be able to
- **explain the importance of Questions**
- **list the purpose of questions**
- **classify questions used for teaching/training**
- **describe the characteristics of good questions**
- **explain the steps in questioning technique.**

Introduction

Questions are essential teaching tools and their skillful use is part of instructor's job. Good questioning is an art. Questions play important role in learning, teaching and testing. Properly used questions can also helps participation in the instructional subjects.

But on the other hand, the learner can continue to day dream or even his present participation may be spoiled if the instructor uses improper methods of questioning.

Good question lead to good communication and understanding amongst trainees and between the instructor and his trainees.

Purpose of Questions

Questions are asked at different stages of a lesson. There are certain important purposes of asking questions in classroom. They are as follows:

- Stimulates interest in the lesson.
- Helps to maintain attention.
- Helps stimulate thought provoking of trainees.
- Provides trainees to think.
- Enables trainees to recall the answer from their memory.
- Enables trainees to clear doubt and misunderstanding.
- Enables the instructor to find out the effectiveness of teaching-learning.
- It serves as a revision.
- To create trainees confidence of having acquired knowledge.
- Makes the trainees use their previous knowledge and test their knowledge as well as achievement of learning the subject.
- Establishes communication between the Instructor and trainees.
- Focus the trainee's attention on the major points or principles to be remembered.
- Develops the ability to organize ideas and speak effectively.
- To find out individual differences and difficulties.
- To call for the attention of the inattentive learner.

Classification of questions

- Introductory/preliminary questions.
- Developing questions.
- Disciplinary questions.
- Recapitulative questions.

Introductory questions

These questions are asked at the preliminary stage in order to introduce the subject matter to the learners. These questions are also known as introductory questions. These are often meant for testing the previous knowledge of the trainees to prepare them for the topic in hand.

Developing questions

Developing questions are the life and blood of the main subject matter. These are teaching questions. They are most useful during the presentation steps of teaching a lesson. The main objectives of these questions are

- To develop a particular line of thought.
- To present significant facts to the trainees.
- To lead the trainees from step by step information for observation.
- To keep the trainees alert throughout the lesson.

Disciplinary questions

The question that were asked in order to claim the attention of the inattentive learners to make them participate in the activity of the class are known as disciplinary questions.

Comprehension questions

These questions are used to evaluate the understanding of learners after completion of the lesson for application and testing the knowledge acquired.

Recapitulative questions

Recapitulative questions are highly useful to test the result and outcomes of what the teacher taught. These questions are generally put at the end of the lesson or even when the particular unit of lesson is finished. After these questions there is no teaching taking place.

In addition to the above important questions, some more type questions are there which may be used in different purpose as per the needs.

- Review questions
- Presentation questions
- Inviting questions
- Assignment questions
- Test questions
- Examination questions
- Problem questions
- Thought provoking questions
- Drill questions

Characteristics of good questions

There are certain qualities required to say that the question is good. Those qualities are as follows:

- Clarity
- Simplicity
- Challenge
- Specificity
- Definiteness
- Relevance
- Language
- Directivity

Clarity

The question must be constructed in such a fashion that the trainees should understand easily what is wanted by the questions, even through they may not know the correct answer to the questions.

E.g.: What is the make of the Scooter using? - This is a confusing question.

Whereas, **what make of scooter you are using**? - is a clear question.

Simplicity

The teacher must carefully use the wording in the question without having any unusual terms which may be difficult or impossible for the trainees to understand the meaning. Therefore, questions must be simple.

Challenging

A good question must stimulate thought i.e. to compare or to evaluate and come to a conclusion and should have a challenging nature.

E.g.: How does the cost of a Diesel Engine car is higher than a Petrol Engine car?

Specificity

Question should call for specific rather than general answer and free from ambiguity. The trainee should never be encouraged to bluff and generalize without having some data on which to base the answer.

Definiteness

Question must not be subjected to, too many interpretations. There should be only one answer to a question.

E.g.: Who was your Chief Minister? - this is not a correct question, whereas, who was your first Chief Minister? - The question is having a definite answer.

Technique of Questioning

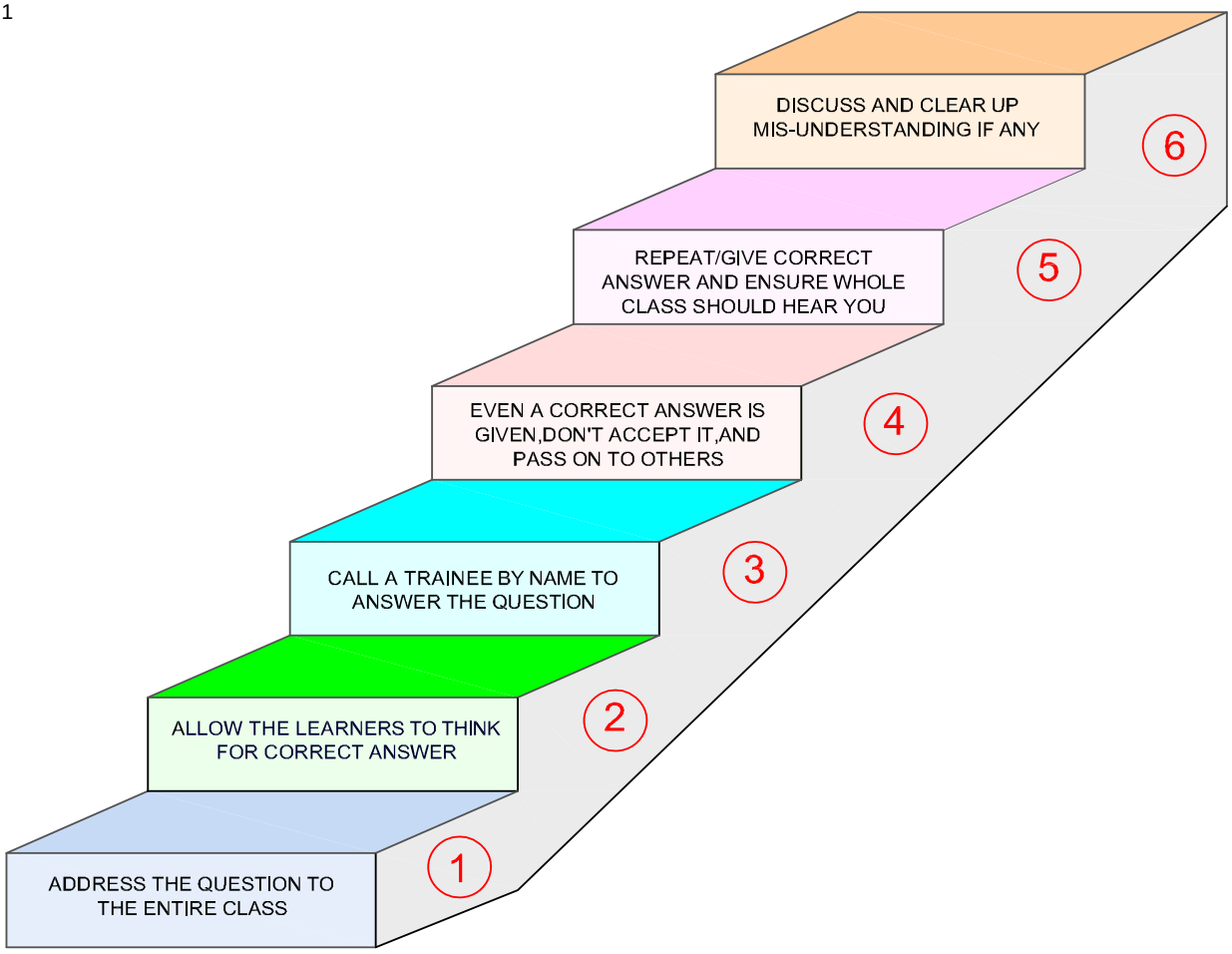
"The Art of Classroom questioning" is shown in Fig 1.

- Throw the question to the entire class.
- Allow sufficient time for the trainees to think for the correct answer.
- Call a trainee by name to answer the question.
- Listen to the answer and do not accept the first correct answer. Pass on and ask some more trainees to make sure how far others know it.
- Repeat/Give the correct answer clearly and loudly and ensure that the entire class hears you.
- Discuss and clear up misunderstanding, if any.

Important Note:

- Question should be in a clear and easily understandable language. Accept individual answering only. Question should be asked in a pleasant manner and engage the trainee to think and give the correct answer.
- Allow one trainee to answer at a time; do not allow a group answering.
- At the end, correct answer given must be appreciated so that it gives a source of encouragement to the learners.

Fig 1



Improper techniques of asking questions

- Double and triple questions
- Rotational questions to the same learner repeatedly
- Questions continuously
- Questions to ask bright trainees only
- Asking yes or no questioning in teaching

Class room question may be classified under the headings. “Thought provoking or interpretational questions. Memory or recognition type questions”.

Use the 5W’s and 1H

Thought provoking question call for the ability to answer in terms of thinking/recalling and responding. This type of question is also called as “FACT” questions. This type of questions should be asked that include the words, Why, What, Who, When, Where, How, etc.,

E.g. What is the use of information sheet?

Why teach only one procedure at a time?

Memory type questions

These questions which are to be answered with reference to something that has been learnt in the past. Hence the trainee just has to recollect the previous experience, even by observation and can be answered without much thinking. This type of question should be asked with the - How, Where etc.,

E.g. How milling machine is classified?

Where round file is used?

The question can be named as per the situation or the occasions in which it is being asked. Accordingly to questions which can be asked in each step of teaching are called as follows:

Preparation Step	:	Introductory or review questions
Presentation Step	:	Developmental questions
Application Step	:	Recapitulative questions or Revisionary questions
Test Step	:	Test question or Examination questions, Assignment questions, Drill questions, Comprehensive questions etc.,

Skill and its basic elements

Objectives: At the end of this lesson you shall be able to
- **define Skill**
- **explain the basic elements of Skill**
- **explain the characteristics of Skill.**

Introduction

The most difficult and important part of our training is to transfer the skill from the Instructor/Trainer and enable new trainees to become competent and confident worker. To achieve this goal it is very much necessary to carryout test and skill analysis based on our training. It was **W. Douglass Seymour,** who had first drawn out attention on the "Skill analysis training".

Definition of Skill

Every job has both knowing and doing sides. Knowledge shall be used throughout this text as the "information", that is stored in the memory of the learners. This is the most normal use of the word "knowledge".

"Skill is defined as the thoroughly established habit of doing a thing in a most economical manner. Skill normally refers to action - Intellectual or physical and reaction to ideas and thinking, which a person performs in a competent way in order to achieve a goal".

Any skill and action has four general forms of actions and reactions.

- Perception
- Recall of knowledge
- Plan
- Performance or execution

Based on the definition of skill, trainers and educationists distinguish four different varieties of skills as follows:

- Intellectual skill - Thinking - a cognitive skill
- Acting - Physical skill
- Reacting - To things, situations and people in terms of values, emotions and feelings
- Interaction - With people in order to achieve some goal such as Communication, Motivation, Perception, Acceptance, etc.

The other types of skills are recall skill, perceptual skill, discriminatory skills, manipulative skill, procedural skills, problem solving skills, speech skills etc.

Basic Elements and characteristics of Skill

There are three basic elements of skill. They are as follows:

- Accuracy
- Speed
- Workmanship

Accuracy

This is the first factor required for a skill. Accuracy means the performance to achieve the given dimension of the job. Accuracy will be attained also by repeated practice in doing the skill. A trainee cannot get the correct accuracy in the beginning, but he can be able to get the accuracy by doing number of times. The accuracy in other words called "tolerance".

Speed

This is the second important factor in developing skill. Speed is nothing but the minimum time taken to complete the skill. The trainee will be able to do the skill in a standard time. But, after gradual practice or repeated performance for a number of times, he can establish a minimum speed by which he can complete the skill. Hence it is required to practice a number of times so as to establish a minimum time or speed to complete the skill.

Workmanship

This is defined as the Quality attained thorough practice of using or handling the tools, materials and equipments in a systematic and economical manners.

It is also known as "efficiency of doing a work". The workmanship cannot be acquired in one or two attempts, but with a constant practice within a definite time and tolerance. In doing variety of skills, definitely the workmanship can be acquired.

Characteristics of Skill

There are three basic characteristics of skill. They are as follows:

- Chain or motor response (stimulus - response)
- Movement co-ordination and
- Response pattern

Chain or motor response

At the sight of the object, the sensing organs get activated. These stimulations results in certain action called response muscular movement like movement of fingers, legs, arms and toes are called motor response. When a number of responses are put together it is called the chain or motor responses. Performance of skill is by the result of chain or series of movements with linking each other.

Movement co-ordination

The change of behaviour for developing a skill is the result of the co-ordination of hand, muscular, nerves, eye movement etc. Motor skills are being performed correctly by the coordinated movements of hands and eyes and also other organs according to the types of skill to be performed.

Response pattern

We can see the skilled behaviour as the organization of Stimulus-Response chains into large response pattern. Skill development depends upon putting more complex human responses (the smooth flow of responses) into a single response pattern is involved in acquiring skill in a perfect manner.

Model Questions

Theory 4.3

11 What is referred to as the throughly established habit of doing a thing in a competent way?

A Skill
B Aptitude
C Attitude
D Knowledge

12 Which type of skill category the “Thinking” belongs to?

A Acting skill
B Reacting skill
C Physical skill
D Cognitive skill

13 What is the first important factor of skill?

A Cost
B Speed
C Accuracy
D Workmanship

14 Which characteristics of skill activates the sensing organs?

A Motor response
B Response pattern
C Movement coordination
D Performance of skill

15 What is acquired with a constant practice in the development of skill?

A Speed
B Aptitude
C Accuracy
D Workmanship

Phases of Skill learning

Objectives: At the end of this lesson you shall be able to
- **analyse the seven steps method of transfer of skill**
- **explain the three phases of skill learning**
- **explain the process of acquiring the skill.**

Skills vary widely in type and complexity; the learning process that individuals go through when acquiring various motor skills is similar.

The physical skill could be learnt by "simple watching and doing". This way the skill was transferred from father to son, when he held his son's hand and took him to the working place. Many employers preferred this method as this way they could expertise certain contact over their employees and partly because there was no systematic study about how the skill could be transferred.

It was **Seymour Brothers** (1954) who introduced to breakdown the job into several parts as key points and prescribed seven steps method of transfer of skill.

- Show the learners how to do it.
- Explain the key points.
- Let them watch, you do it again.
- Let them do the simple and complex parts of the job separately (Imitation)
- Help them to do the whole job (Linking)
- Let them do the whole job, but watch again (Refinement)
- Put them on the job for their own practice (Practice)

True and complete learning is said to comprise three different phases. These are phase of Acquisition of Retention and lastly the phase of Recall.

Acquisition phase

This phase of learning means to make impressions on the mind. Attention and perception, these are the two main factors involved in this stage of learning. Perception does not merely means seeing an object but seeing it with meaning. How much an individual does learn depend upon his perception and the amount of attention he has paid to the learning situation.

When the individual is motivated to the learning situation through inner drive, desire, need and use his attention is automatically voluntary. For example one's interest in gramaphone, radio, television etc. may motivate him to learn science. When external motivation and incentive (Prize or reward) are used for the learner to learn, then the attention that he gives to the learning situation may be called on involuntary one. Both kinds of motivation are useful for the purpose of acquisition in a learning situation.

So far as perception is concerned, it is said by the psychologist that one should posses the capacity to receive and learn the things that the teacher wants to teach him. This is known as one's mental set or readiness to learn. This psychological readiness on the part of the individual is pre-requisite to the acquiring of any kind of learning. It is often said "you may take a horse to the drinking pool but it depends on the horse whether it wants to drink water or not.

Phase of Retention

It is a fact that one tends to forget things he has learnt if he does not use them. In this connection, psychologists have recommended over learning as opposed to under-learning. Many things are remembered almost for the entire life time of an individual if these have been over-learned. This means that the materials have to be drilled and repeated OFF and ON. In view of the above it is clear that one should not be satisfied with the minimum amount of study but drill oneself beyond the level of just recall for remembering things. Another important factor which affect retention, is the meaningful organisation of the material. The meaningful the material, the more it is retained.

Application phase

The third phase of learning is called recall. Learning is said to be complete only when the learner, can recall the material from memory when it is needed. In this connection, Aristotle propagate his principle of contiguity as follows:

If a thing is to be recalled, it must be associated contiguously with something else. If it is to be recalled, it must be recalled contiguously with the former associated idea, which means that our experiences are not stored up in the mind in a crude unrelated way. They are tide up together in accordance with certain mental principles.

The principles of recall to memory may be explained through the laws of association. The law of similarity and the law of contrast. Similar ideas get associated together, so also any idea tends to suggest to its opposite.

Three phases of Skill learning

As our knowledge about the skill goes further we gradually understand that development of physical skill takes palce under three distinct phases. They are as follows:

- Cognitive phase
- Fixation phase
- Autonomous phase

Cognitive phase

What should be done, to what purpose, in what sequence and how. In this phase the learners under the guidance of the Instructor develops the related knowledge (theory) in executing the skill. The learner has to observe the skill which he has to do later, the Instructor described "What to do, how to do and what are the safety points to be observed while doing the skill". The Instructor also will explain the sequential procedures by which skill can be completed with minimum error. In this phase the Instructor demostrates the skill so as to show the learner's systematic way of doing the skill.

Fixation phase

In this phase the learners learns the correct behaviour without making any mistakes through a number of repetitions, correct behavioural patterns are practiced with the change of making incorrect responses is reduced to 'Zero Error'. Thus, the behaviour of the learner or the systematic way of doing the skill is fixed. The coordination of conceptual and motor skills will help to develop better result in doing the skill, executing the action and response to reaction in a step by step manner.

At this stage there is conscious application of knowledge, "What to do and how to do" aspects of operation are "Controlled" - "When to do" and "How well done" aspects of operation develops through practice. This phase leads the learners to the autonomous phase.

Autonomous phase

In this phase the learner learns to perform his job independently without error and within the stipulated time (with correct speed). The learner gets a self confidence and characterized by the reduction of the need for conscious attention and thinking of the action. The skill becomes almost a set of reflection - one triggering of the next without much effort, being called for from the worker. In this phase the learner gets the expertness and attains a better performance of the skill. Performance of all the aspects - the skill becomes automatic.

Skill Learning

Process of acquiring the skill

Skill can be acquired only after undergoing a practical training. In vocational training the skill related theory will be taught first. Next, the Instructor will demonstrate the skill elements systematically with safety precautions to follow in handling the tools, instruments, equipments, machineries etc. in a sequential order. After that the trainees will be asked to perform the skill. In order to enable the trainees to do the task assigned in a proper manner they must pass the stages of observation participation, imitation and repetition. These are explained below.

Observation

First stage is observation stage. The instructor first demonstrates the operation of particular machine. The trainee's job here is only to observe the demonstration. The instructor's action will be observed very keenly at this stage and hence care must be taken not committing errors. Trainees should observe the following:

- What is being demonstrated?
- The method of performing a skill.
- Techniques of performing the operation.
- Correct way of handling tools & equipments.
- Safety precautions to be followed.

Participation

This is the stage of association. Here the trainees will be given an opportunity to handle the tools/raw materials used in the demonstration. The instructor will give the guidance only when necessary. This will develop their ability to handle/use the tools etc and also to work in a group with confidence.

Imitation

In this stage the learners try to imitate the instructor. This will be their first experience of doing any job and there may be a possibility of mistake being committed. The instructor should guide the trainees at this stage. Otherwise they are likely to form or follow bad or wrong habits. The most important thing that an instructor has to keep in mind is that imitation must be arranged immediately, without which the trainees tend to forget what they observe.

Repetition

In the imitation stage with proper guidance of an instructor the trainees learn proper method and technique of practical work. But for perfection, speed and accuracy they have to repeat it again and again. So repetition plays an important role while acquiring and mastering the skill.

Demonstration Plan

Objectives: At the end of this lesson you shall be able to

- **define demonstration**
- **explain the purpose of demonstration**
- **explain what is a demonstration plan and its necessity for training**
- **describe the elements in the demo plan format**
- **list the key points to be followed before, during and after the demonstration**
- **analyse the need for shop talk and its stages in Skill development.**

Introduction

Planning is an important guide, which an instructor should carryout in advance so as to present the matter (Knowledge or Skill) in a correct sequential order. The steps followed in teaching skill are similar to teaching a lesson. Even though there are so many methods available to teach a lesson, "Demonstration method" is the only one method being followed to teach skill in a systematic manner. In this process the Instructor has to tell "What he is going to do and then he himself has to do the skill and show that", like a worker in front of the learners.

Demonstration

Demonstration is a planned performance of teaching skill elements to the learners (trainees) in a systematic, sequential order, based on the scientific principle of an experiment.

Purpose of demonstration

- It helps the learner to concentrate attention and develops their observation power.
- The skill teaching - learning process is carried out in a step by step systematic way with safety precaution in handling tools, instruments, equipments along with self safety and others in the environment.
- It increases the efficiency of skill teaching and skill development activities because it puts the skill information in concrete application.
- The step by step activity performed by the instructor becomes interesting and meaningful than illustrated discussion or oral explanation.
- Demonstration occurs when learners have a hard time connecting theories into actual practice or when learners are unable to understand the application of complex concepts.
- Teaching skills by demonstration is the only best method followed to transfer skills from an expert (Instructor) to a novice (trainee)

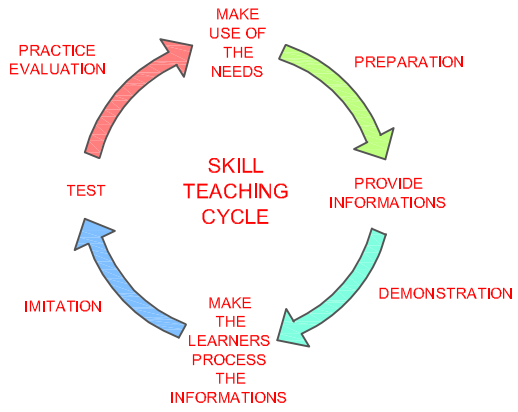
Demonstration plan

It is a guidance plan for the instructor to conduct a demonstration to teach skills to develop the occupation specific physical skills of learners in a systematic manner. The demonstration plan format is similar to lesson plan format consisting of four steps.

- Preparation
- Demonstration (Presentation)
- Imitation (Application) and
- Practice/Evaluation (Test)

The skill teaching cycle is shown in Fig 1.

Fig 1



FOUR STEPS OF DEMONSTRATION

The specimen demonstration format is given for reference and the explanation of each element is described as follows:

DEMONSTRATION PLAN

Name ..... Admin No .....

Trade ..... Date .....

Semester ..... Demo No ..... Week No ..... Time Required .....

I Preparation

a Skill : .....

.....

b Objectives: At the end of this demonstration, the trainee shall be able to

1 .....

2 .....

3 .....

4 .....

c Tools & equipments required

.....

.....

d Materials required

.....

.....

e Introduction

i **Review :**

ii **Motivation :**

II Demonstration (Presentation)

Procedure (DO)	Information points/ safety procautions (Tell/Show)	Spot hints (Ask to do)

Procedure (DO)	Information Points/ Safety Precautions (Tell/Show)	Spot Hints (Ask to do)

III Imitation (Application)

a .....

b .....

Summary .....

.....

IV Practice/Evaluation (Test)

.....

Next skill :

.....

Explanation of the demonstration plan format

Step 1: Preparation

- Skill title.....(the particular Skill to be filled in here) This must be a skill and this demonstration should not take more than 30 minutes at a time. Shorter the demonstration, the better will be its effect.
- **Objectives**

  As the demonstration is for a particular skill, there will be only one objective. But, there could be one or two additional objectives very closely interlinked and not separate ones.
- **Tools & other requirements**

  Indicate here the various requirements of raw materials, tools, equipments, measuring/checking instruments etc. to conduct the demonstration, so that this could be arranged properly before the demonstration commences. You have to correctly furnish the specification of the required items and quantity required, for doing the demonstration of the skill.
- **Introduction**

  Before the actual demonstration of the skill commences, a short introductory talk (Review) by way of preparing the learners is done.

  The importance of the skill, how it is related to other known skills and such information would create a desire (Motivation) in the learners, to learn the skill.

Step 2: Demonstration (Presentation)

Three columns under this are

- **Procedure:** The actual step in the performance (do) of the skill in sequence are written here.
- **Information points/safety precautions:** Against this step, the sequential procedure/any information such as Why? What? or How? (Tell/Show) and important safety precautions that may be relevant at this step are written in the form of/using catch words-key words.
- **Questions:** Questions to draw attention, stimulate thinking or to recall information and to check understanding, are written against each stage.

Step 3: Imitation (Application)

After the demonstration is over, opportunity is provided to learners, to do the skill by themselves independently and instructor (should rectify their mistake, if any - then and there) guides them to learn the skill correctly and quickly.

- **Summary:** The sequential steps in the performance of the skill and important information/safety precaution are stressed and repeated.

Step 4: Practice/Evaluation (Test)

In this step the instructor provides opportunity to learners to practice the above skill such that they attain accuracy, speed and quality through repetition following safety precautions. During this step the instructor has to evaluate the trainee performance.

- **Next skill:** Write the title of the next Skill to be demonstrated here.

Well plan your work and work your plan

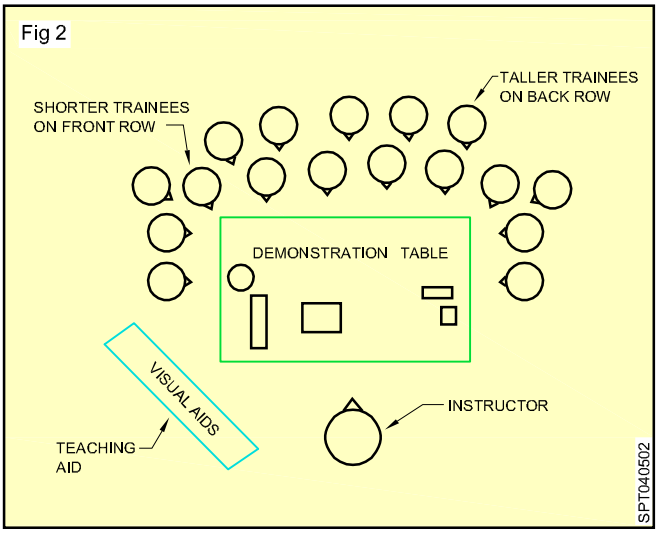
Demonstration Technique

Holding a hammer, a screw driver, a plum-bob for a straight edge or even positioning of arm during filing, form a demonstration. All basic skills must be demonstrated before trainees with required tools, instruments, raw materials arranged on the demonstration area with the learners.

Key points for conducting effective demonstration

- In order to ensure the success of demonstration, the instructor must prepare the plan minutely and very seriously, collection of material related to the demonstration to be well-planned in advance.
- The demonstrator must rehearse the activity several times before the real demonstrations for a smooth sequencing of the steps as well as accuracy of the result.
- Arrange the learners around the demonstration area or at a distance where they will be able to observe fully what is going on as shown in Fig 2.

Fig 2



- Arrange the tools, instruments, raw materials etc. required for the demo on the table in a sequential order systematically according to the step of its use as per the demo plan.
- The place must be quiet in order to sustain the observers attention and interest during the activity; Remove irrelevant items from demo area if any, to avoid distractions.

- During the demonstration, the clear language should be used so that learners may understand the instructional step easily.
- They are allowed to take down short notes or record some data which may be analysed afterwards.
- The instructor can use various teaching aids like models, chalkboard, graphs etc. during demonstration. It helps the teaching learning easier, and quick to permanent learning.
- After the demonstration learners should be involved to do imitate the simple or complex part of the step of activity demonstrated by the instructor.
- Depending on the kind of demonstration to be undertaken, pointers or questions may be used to focus learner's attention and avoid distractions.

While the workshop trade instructor arrange the trainees standing around the demonstration table, the computer trade instructor may arrange the trainees comfortably sitting and observing the effects of step by step activities on the image displayed over the big screen with the help of multimedia projector. (Fig 3 and 4)

Fig 3

Fig 4

Each trade instructor has to plan and arrange the demonstration activities according to the specific skills and their complexity to transfer them to the learners.

Learning by imitation or copying is a very fundamental and common kind of learning. A novice copies an expert in a field of skillful work. Somebody serves as a model for somebody else. You as an instructor serve as a skilled expert of your trade for your trainees. You should be always aware of that.

You will have recognized that your trainees

- Sometimes do wrong although you demonstrate right
- Sometimes do not execute the operation although you did so in the past
- Sometimes executes something which you did not demonstrate
- Go it differently, some quicker, some slower
- Develop their own ‘style’ of executing the operation
- Sometimes copy observable behaviour and even develop habits, attitudes and values
- Sometimes - not only copy the skill but even modify it and transfer if to new application

These possible results of learning by imitation or ‘model learning’ can be easily understood if regard the basic processes which are involved in ‘learning by imitation’

Skill learning is a complex process which involves the four processes i.e.,

- Attention process
- Motivation process
- Cognitive process
- Psychomotor process

Teaching skills by demonstration alone, without verbal (audio) and visual support will result in a blind imitation - without understanding of functional relationships.

For the successful demonstration, we have to follow certain points during the planning stage and then we have to follow certain other points during the demonstration and some more relevant points after the demonstration also.

I Points to be considered while planning to teach skill

- Be specific in the objectives as to what you expect from the learner to learn or to acquire proficiency in the skill.
- What are the main points to be explained during the demonstration should be listed out in order.
- Availability of the time according to the steps to be covered.

- Check in advance the materials, tools, equipments, etc., to ensure that they are in good working condition.
- Check up the space availability for the demonstration, so as to accommodate the learners to observe the demonstration properly.

II Points to be followed during the demonstration

- We should use such tools and equipments during the demonstration that will be used by the trainees for their practice after the demonstration
- Observe all safety precautions and emphasize their importance
- Perform the demonstration step by step in a sequential order.
- Provide immediate participation by the learner
- Adopt only one method of demonstration at a time
- Clear the doubts if any in the minds of the learners

III Points to be followed after the demonstration

- Provide materials for immediate practice under your close supervision
- Correct the doubts of the learners or wrong method of doing work during your supervision
- Insist on observation of safety precautions all the time.
- Pay more attention to individual differences if necessary, re-demonstration has to be done to weaker trainees.
- Check/observe the progress of each trainee in learning the skill
- Let the trainees know the mistakes committed by them and explain
- Show interest in each individual.

Shop Talk

Shop talk is also another type of teaching method. But by this, precise information very much relevant to develop skills only are presented to the learners at shop floor situations.

Regarding the teaching cycle, shop talk can be differentiated according to the purpose they serve in the teaching cycle. They are

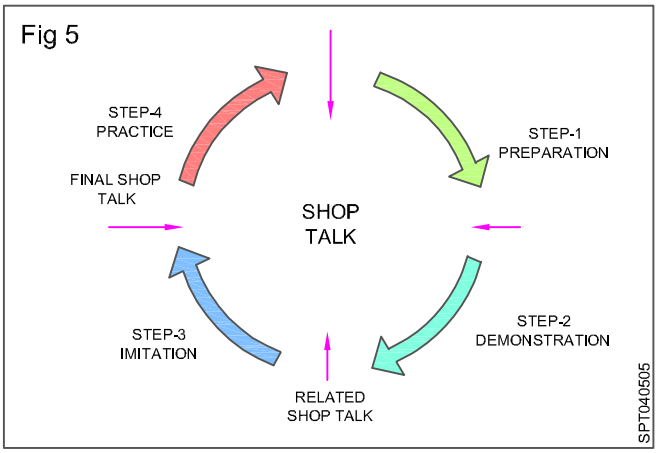
- Introductory shop talk
- Related shop talk
- Final shop talk as shown in Fig 5.

Types of Shop talk

Introductory shop talk

- Introduction into a new skill
- Precise description of the skill (working steps and drawing of the exercise)

Fig 5



- Skill related knowledge is taught (skill information, working steps and drawing of the exercise)
- Demonstration of materials, tools, machines
- Demonstration of skills

Related shop talk

- Praise in the case of progress in executing the working steps
- Remedy in the case of learning difficulties
- Counseling in the case of difficulties concerning working steps machine operating, characteristics of tools and materials
- Providing specific job know, how.
- Providing basic job knowledge e.g. security rule, energy saving etc.

Final shop talk

- Control of the job
- Explaining the meaning of the exercise in the sequence of the exercises for the next exercise
- Individual feed back with counseling for future improvement

A shop talk can be addressed to an individual trainee, to a pair of that or to a small group (up to 6 trainees)

An introductory shop talk will always be given to a small group, whereas the related and final shop talks can be given to individuals, pairs of small groups. It depends on the given circumstances.

The following steps and the following form are proposed for the preparation and the presentation of every type of shop talk. You may modify them according to your experience and to your needs.

Step 1: Basic considerations

- With the help of the information (specific objectives, instructional activities, skill information, working steps, drawing of the exercise) set the objectives, describe your class in terms of previous knowledge and abilities, consider the resource needed/available.
- It is also very important to consider that the trainees have in their hands the skill information sheet, the specific objectives, the drawing of the exercise and the working steps.
- Regard especially the skill information sheet as learning aid. Allow them to use it and emphasize important information, add new ones and explain functional relationships.

The trainees need your shop talk to relate the “What”, “How” and “Why” of the skill.

Step 2: Organize the content

- Set the key words, find the logical sequence and the teaching aids you need.

Step 3: Prepare the plan

- Sequence your subject matters, put key questions. Match the teaching aids to the elements of the subject matter. Anticipate the trainee’s behaviour and consider how to ensure that the trainees have understood the talk.

Step 4: Prepare yourself

- Practice your talk on a colleague or on a tape recorder or on internal speech.

Step 5: Present the talk

- Here are some basic points.
- Position the trainees along side you. Do not face them
- Make the trainee to do/to understand the job right first time
- Wrong or bad habits or knowledge is hard to extinct

Step 6: Review your talk

Use the feedback information you have collected in order to improve this talk for the next time and your ability to develop future shop talks.

Model Questions

Theory 4.5

21 Which method is best suitable for skill teaching?

A Lesson method
B Lecture method
C Project method
D Demonstration method

22 Which is the third step in skill teaching cycle?

A Practice
B Imitation
C Demonstration
D Application

23 In which step the instructor has to evaluate the performance of learner?

A Presentation
B Imitation
C Application
D Practice

24 Why the instructor must rehearse the demonstration?

A Time saving
B Quick learning
C Develop own style
D Smooth sequencing of steps

25 Which process makes the learner to perform the skill?

A Cognitive process
B Attention process
C Motivation process
D Psychomotor process

26 When do the instructor given remedial instruction for skill learning difficulties?

A During demo
B Introductory shop talk
C Final shop talk
D Related shop talk

Theory 4.1

I Multiple Choice Question items

Choose the correct answer:

1 While teaching in which step the instructor should include safety equipments

A Preparation B Presentation
C Application D Test/Assignment

2 What is the name, after the lesson in which step trainees are tested their knowledge?

A Preparation B Presentation
C Application D Assignment

3 In which step the learners are encouraged to ask questions?

A Preparation B Presentation
C Application D Test/Assignment

4 Under which step the equipments and material are included for conducting class?

A Preparation B Presentation
C Application D Test/Assignment

5 Which are is the advantages of using a lesson plan?

A Suitable atmosphere is created
B Specific teaching objectives
C Develop the topic in a logical order
D Law of exercise is applied

Theory 4.2

6 What is the purpose of questioning a learner in a classroom?

A Helps learner to score more marks
B Makes the learner to get distracted
C Provides opportunity to think and answer
D To select the most intelligent learner

7 How the instructor calls for the attention of an in attentive learner in a classroom?

A By calling his name
B By reporting to the principal
C By giving punishment to him
D By the use of disciplinary questions

8 What type of question is used at preparation step?

A Drill questions
B Assignment questions
C Introductory questions
D Comprehensive questions

9 Which question is used by the instructor to test the result and outcome after he taught the learners in a class?

A Introductory questions
B Developing questions
C Disciplinary questions
D Recapitulative questions

10 Which characteristics makes a question free from ambiguity?

A Clarity B Simplicity
C Specificity D Challenging

Theory 4.4

16 Which skill could be developed by simply observing and doing it?

A Active skill B Thinking skill
C Physical skill D Intellectual skill

17 Which phase of learning make learner perceives the information?

A Retention phase B Acquisition phase
C Application phase D Atomization phase

18 What is taught first in vocational training?

A Safety B Soft skill
C Related theory D Communication skill

19 Which phase make the learner consciously apply the knowledge to control operations in developing skill?

A Cognitive phase B Fixation phase
C Application phase D Autonomous phase

20 How the learner is able to master the skill?

A By imitation
B By repetition
C By observation
D By Participation

UNIT - V

INSTRUCTIONAL MATERIAL

Learning Outcomes to be achieved from this unit:

- **Plan and prepare the instructional material required for imparting training**

Principles of Teaching Instructional Material — Theory 5.1

Written Instructional Materials

Objectives: At the end of this lesson you shall be able to
- **define written instructional materials**
- **state the 4 uses of written instructional materials**
- **list the various types of written instructional materials**
- **describe the various types of written instructional materials**
- **brief the points to be kept in mind for the preparation of written instructional material.**

Written Instructional Materials (WIM)

The development and use of teaching and learning materials is an essential need in the vocational training programme. We do not have enough teaching and learning materials like many of the developed countries and hence improved learning materials results when certain and used by the instructor/trainer and for the efficient benefit of the trainees/learners.

It is essential that instructors must be able to produce necessary inputs for the vocational training system. In any media system the multimedia is the goal, whereas other written instructional materials are the starting points of development of instructional or teaching learning materials.

These items may be available as a kit or package form and may consist of textbooks, consumables, learning materials, slides, films, recordings, electronic media, computer programs, online services, DVDs, CDs and other commonly accepted instructional tools. Hardware to utilize aforesaid resources are not considered as written instructional materials. Written Instructional Materials are resource materials prepared by an Instructor.

The four important uses of instructional material are

a To impart uniform instructions.

b To attend to the individual learning problems.

c To save learning time in the class room and shop floor and

d To increase the learning time.

The following are the W.I.M prepared by the instructor for his own use to better presentation in class room and shop floor.

a Lesson plan

b Demonstration plan

c Information sheet

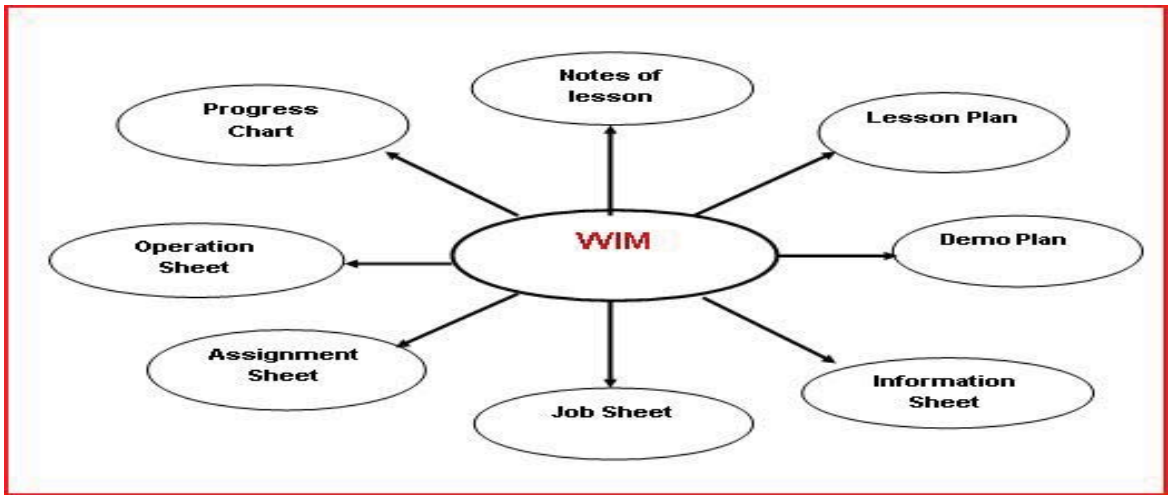
d Operation sheet

e Job sheet

f Experiment sheet

g Pre-job check sheet

h Final-job check sheet



Lesson Plan:

Lesson plan is a detailed description of the course of instruction for an individual lesson related to theory prepared by an instructor for a specific duration of time.

Demonstration Plan:

Demonstration plan is a detailed description of a practical lesson or a skill prepared by an instructor for a specific duration of time.

Information Sheet:

These are materials prepared to suit specific needs of your learners. It aids better understanding and knowledge of the related information and procedures for learning. They usually contain such information as technical facts; definition of terms; machines, materials and tools required; processes and principles involved in various operations and other information not readily available in text books. They must be written with a view to review the classroom teaching or shop talks or to supplement what has been learnt. In fact they contain all that is required to enable the trainee to know 'Why of the job?'

Assignment Sheet:

Assignment sheet is prepared by an instructor which consists of objective and subjective type of questions given to the trainees to prepare and write exact answers by referring the information or notes of a particular lesson.

Job Sheet / Operation Sheet:

Consists of detailed information points, step by step procedure, safety precautions to be followed of a particular skill. The difference between job sheet and operation sheet is, a job sheet consists of number of tasks or number of operations to be performed for a particular skill. Operation sheet consists of procedures to be followed for a particular task or specific operation of a skill.

Check Sheet: (Prejob & final)

Check sheet is a document, used for collecting data, used to reduce failure, safety to ensure critical items that are not forgotten. It is a document typically a blank form that is designed for the quick, easy, and efficient recording of the desired information, which can be either quantitative or qualitative. When the information is quantitative, the check sheet is sometimes called a tally sheet. Two types pre-job check sheet and final job check sheet used to list the important or relevant actions, or steps to be taken in a specific order.

Progress Chart:

Formative information prepared for a teacher or a student which shows the progress of their tasks completed or yet to complete, progress of teaching learning activities. Student's progress can be tracked by their monthly marks statement.

Characteristics of instructional materials

The desirable characteristics of instructional materials are:

a gives accurate information and direction;

b written in simple language understandable to all;

c sequenced correctly in a step-by-step procedure;

d provides help in order to learn from simple to complex;

e stimulates thinking and help learning;

f provides clearly stated obejectives;

g provides self tests and criterion tests to check learning and attainment of objectives;

h provides references for further study; and

i guides to adopt safe working habits

Points to be kept in mind while preparing instructional materials

Following points may be kept in view by instructors during the preparation of written instructional materials:

a Use simple, direct, and easily understandable language;

b Supplement written information with as many sketches as would help the trainee grasp the information with clarity;

c Use impressive layout;

d Give specific guidelines wherever necessary;

e Do not give a volume of information, rather limit the contents that are absolutely essential;

f Provide questions that lead to the attainment of objectives;

g Follow syllabus, and titles that will cover the syllabus;

h Provide references for additional study if required;

i Provide the specific objectives or learning outcomes in clear terms, to enable the trainees to know what exactly is expected of them at the end of each learning task.

- The instructional materials should be prepared keeping in mind, considering the standard of the trainees/learners.
- The objectives are to be easily identified and should be expressed in simple in clear terms.
- The selected topics should be consists of directly related to the knowledge of trainees and to the skills of trainees, which are inter-related/integrated with knowledge and skills of trainees that later more achieved by them.
- The principles of learning related to Pedgogy and Andragogy.
- Topics are so organized and sequenced to the need of the trainee in the following manner.
- Pre-requisite skills and knowledge are introduced in advance. Those are combined with subsequent items and applied.
- Knowledge and skill are attained through a series of information and task of gradually increasing difficulty.
- Skill and knowledge acquired in one task are immediately used as an exercise and assignment.
- Methodology: Self learning (programmed learning exercise sheet etc).
- Presentation time: An important factor over looked by the trainer/instructor.
- Validation of instructional materials.
- Reshape if needed after summative and formative evaluation.
- Formative W.I.M. must have the following qualities.
- Description should be free form errors of grammer spelling and typography.
- Sentence structure and picture should be clear simple, concise and straight forward.
- Aims of the instruction of information on sentences should communicate the instructional goals completely.
- Use of punctuation abbreviations and hyphens is correct.
- Ambiguity should be avoided in statement and it should be clear and straight forward.

Lesson Plan

Trade: **Module/Unit:**

Date: **Time:**

Lesson No:

I PREPARATION:

Title :

1 **Objectives:** At the end of the lesson the trainee shall be able to

1

2

3

4

2 Teaching Aids:

3 Introduction

a Review:

b Motivation:

II PRESENTATION:

Developments /Topics	Information Points	Hints

Developments / Topics	Information Points	Hints

III APPLICATION:

Summary:

IV. TEST:

Assignment:

Reference:

Next Lesson:

Demonstration Plan

Trade: **Module/Unit:**

Date: **Time:**

Demo No:

I PREPARATION:

Skill:

1 **Objectives:** At the end of this demonstration, the trainee shall be able to

1

2

3

4

2 **Tools & Other requirements:**

3 **Introduction:**

a **Review:**

b **Motivation:**

II PRESENTATION:

Procedure	Information Points / Safety Precautions	Hints

Procedure	Information Points / Safety Precautions	Hints

III APPLICATION:

Summary:

IV TEST:

Assignment:

Reference:

Next Skill:

Operation sheet

Trade	Semester .....

Week No	Skill No	Time Required .....

Title:

Objectives: At the end of this demonstration, the trainee shall be able to

A. .....

B .....

C .....

D .....

Introduction	

Operation Sheet & Job sheet

Objectives: At the end of this lesson you shall be able to
- **explain operation sheet and state the elements of operation sheet**
- **explain job sheet and state the elements of job sheet.**

Operation sheet

It is the basic instruction sheet to help the instructor to teach elements of skills of the trade. It tests the trainee how to do the skill. Sequencing the procedures are most important, to enable the learners to do the operation and complete the same successfully.

The trainee must be given direction is the use of tool and materials correctly. This sheet is not written for use in the production of any particular job, but rather for use of any job that need the particular operation. This sheet has flexible application. The title of operation sheet is the name of operation. The operation sheet is prepared by the instructor for the use of learners, to imitating the skill. This helps to form correct habits and learn skill correctly with the minimum personal attention of the instructor. The following are the basic elements of the operation sheet.

Skill: Name of the operation or skill. This would be the same as that of the demonstration. This is obtained job/ task analysis with reference to the syllabus extract.

Objectives: As operation sheet this is for the development of a particular skill. Generally there will be only one objective. This is written performance oriented and trainee centered objectives following the guide lines given in previous chapter.

Tools equipments: Materials and other requirements provide specific tools and equipment required with meticulous detail and as required detail and as required to perform the skill. The exact range of tool, or equipment must be stated to avoid improper choice. If there is a particular tolerance to be achieved or a method of operation is specified, write the tool required for achieving etc.

Material: Mention the type, shape, size etc, of the material so that the trainee can select correct. Never state ambiguous words. Correct statement of materials helps learner and instructor to precise and develops better work.

Introduction: This provide a brief instruction regarding the utility of the operation in completing the skill. The method of learning this element of skill makes the learner a good craftsman. The purpose of learning the skill must be made clear to the learners/trainees.

Procedure: Mention direct and simple sentences while giving procedural steps. The step by step activity serially numbered and in sequence to be done by the learner with safety precautions indicate at the appropriate steps or at the end. The instructor should remember that the correct sequence, in a language used by instructor is to address the trainee. The procedure must be lead the learner to complete the operation successfully to reach the expected standard as per the objective use the words of action such as-mark, measure, cut, layout, drill-ream, turn, etc.

Safety habits: Safety precautions is to avoid accidents to person and equipments must be give. The words such as do not give a deep cut, mark and punch before drilling, call instructor etc must be given using goggles keeping the tools to particular requirements of sharpness, and the like must be explained clearly. A simple operation sheet is given for development.

Operation sheet

Trade		Semester .....
Week No	Skill No	Time Required .....

Title:

Objectives: At the end of this demonstration, the trainee shall be able to

A. .....

B .....

C .....

D .....

Introduction	

DEMONSTRATION PLAN

Name ..... Admin No .....

Trade ...MMV..... Date .....

Semester .....1..... Demo No .....2..... Week No .....1..... Time Required .....

I Preparation

a. **Skill:** Perform Compression test

b. **Objectives:** At the end of this demonstration, the trainee shall be able to do

1 Install compression gauge in the engine

2. Test engine compression in different stages

3 Conclude the results.

c. Tools & equipments required

A petrol vehicle, Compression gauge with adopters, Spare plug, Spanner, Engine oil with oil can, Trainees tool test.

d. Materials required

Engine oil, cloth waste, Banyan cloth

e. Introduction

i. Review : Performance of Vaccum test

ii. Motivation .....

II Presentation (Demo)

Procedure (DO)	Information points/ safety precautions (Tell)	Spot hints (Ask to do)

Procedure (DO)	Information points/ safety precautions (Tell)	Spot hints (Ask to do)

III Application (Imitation)

a. Install Compression Gauge

b. Test the engine compression

Summary: Show and tell how to do this exercise and ask the trainees to do the same.

IV Test/practice (Evaluation)

Ask the trainee's individually

Next skill

Perform oil pressure test

OPERATION SHEET		
Trade :		**Semester :**
Week No :	**Skill No :**	**Time Required :**
Title :		

Objectives: At the end of this demonstration, the trainee shall be able to do

- Test engine compression in different stages

Tools, equipments and materials required

1. A petrol vehicle is running condition
2. Compression gauge with necessary adopters
3. Spark plug spanner
4. Engine oil in oil can
5. Trainees tool kit

Procedure:

Introduction	The engine's compression is tested by the compression gauge. The results of compression gauge in different stages tell us the condition of the engine and with this we can decide whether the engine needs reconditioning or not.
Install Compression gauge	1 Place the vehicle in a level ground. 2 Apply hand brake. 3 Switch off ignition 4 Open the bonnet 5 Remove air filter assembly 6 Remove ignition coil assembly from all the cylinders 7 Remove spark plug from all the cylinders 8 Select correct size adopter and fit with the compression gauge 9 Install compression gauge in 1st cylinder spark plug hole 10 Hold it properly for taking readings 11 Press the accelerator pedal fully and crank engine for few seconds 12 Observe the readings and allow the engine to crank till the needle of the compression gauge stalls. 13 Stop cranking engine 14 Note down the maximum reading obtained 15 The reading obtained during dry test is _____ kg/cm^2 16 Remove compression gauge 17 Put few drops of engine oil through the spark plug hole 18 Install compression gauge again 19 Crank engine and note down the readings 20 The reading obtained during wet test is _____ kg/cm^2 21 Do the same procedure for all cylinders

Job sheet

- Job sheet provides an overall plan of a particular job and it indicates all of the operations involved.
- It shows what is to be done, and how to do it. This must be prepared by an instructor based on demonstration plan.
- The trainees may be asked to prepare job sheets to analyse the job and planning for the work.
- Safety work habits to be followed should also be included in the job sheet.
- Job sheet is similar to operation sheet.
- There is no much difference in between job sheet and operation sheet.
- The Job sheet gives the procedure for a number of skills required in a sequential order, whereas the operation sheet provides the procedure for doing a skill in a particular sequence.
- They must be include same and working habits.
- There is no much difference between the operation sheet and job sheet.
- The procedural steps for each operation is given both in operation sheet and in the job sheet. This will give assistance to the learner in preparing initial materials.
- A model of job sheet and job sheet for a practical job is enclosed for your reference and to study.

JOB SHEET

Trade ..... Date ....

Lesson No ..... Time .....

Syllabus extract..... Name.....

TOPICS

I **Preparation**

a **Objectives:** At the end of this demonstration, the trainee shall be able to do

1 .....

2 .....

3 .....

4 .....

b Introduction

c Procedure Sketch

d Safety

e Assignment

Information sheet

Objectives: At the end of this lesson you shall be able to
- **explain information sheet and its features/elements**
- **advantages of information sheet/disadvantages of information sheet.**

Information sheet

- The materials prepared has to suit specific needs of learners.
- It covers the instruction involved in an information topic.
- It aids good understanding and knowledge of the related information and procedure for learning.
- An information sheet must have six distinct elements viz unit number, title of the unit lesson number, external information and reference to material.

Unit No	:	This will indicate the number of the units
Title of the unit	:	It is the exact title of the unit so that trainee will know what the major area of the unit.
Lesson no	:	Exact number of the lesson in sequence as per the break down of the syllabus.

General information: Main section body of the sheet - selected points briefly explained in sequence and to be is line with the objectives.

Reference material: If any references are available or necessary, the same may be indicated. It may be a book magazine, or even earlier lessons.

Advantages of a information sheet

- Information is well planned
- Information is to the point
- Information is related to the objectives of the lesson
- Information is based on principles of teaching 'must know'-'should know and could know'.
- Information relevant to the actual requirements of the learners.
- Information can be of use for future reference.
- Information sheet is very useful for conducting theoretical sessions.

Dis-advantages of a information sheet

- If not preparely prepared leads to negative factor.
- Trainees being spoon fed.
- It is mostly suitable for theoretical sessions only . A format of information sheet and a information sheet for a topic is enclosed for the development of materials.

INFORMATION SHEET	
Trade :	**Module :**
Lesson :	**Time :**

Objectives: At the end of this lesson, the trainee shall be able to do

A. .....

B. .....

C. .....

D. .....

INFORMATION SHEET

Trade : Machine shop group **Module** : Basic Turner

Lesson : The lathe bed **Time** : 1 Hour

Objectives: At the end of this lesson, the trainees shall be able to do

1 State the importance of the lathe bed
2 Name the types of lathe beds
3 Differentiate merits and demerits of each

The lathe bed is one of the most important part of the lathe and it serves two purposes. (i) It holds the fixed units of the lathe in perfect alignment and (ii) It provides ways on which the sliding units can be operated.

The bed is generally made up of close grained grey cast iron. The reasons are:

1 This metal is easy to machine.
2 The easiness with which it can flow to occupy the complicated parts of the mould, in its molten stage.
3 Under load it may break but does not bend.

The lathe bed may have bed shears machined (i) Flat, (ii) Inverted 'vee', and (iii) a combination of "flat" and "vee".

Accordingly the bed is known as flat bed, "V" bed, and combination bed.

The flat bed is generally provided for lathes meant for heavy duty work and 'V' bed ways are provided on lathes meant for precision work. The combination bed is used in lathes for general purpose work.

The lathe bed is generally rough machined and is kept in the open air for several months for "aging" or seasoning so that it undergoes all possible changes due to climatic variations.

The front and rear ways are rigidly supported by cross webs. The lathe bed is carried on legs, the height of which depends on the size of the lathe. The legs are made hollow castings to accommodate coolant motor, main motor, and electrical switch box.

A detachable portion of the bed is fitted at the head stock end. When turning large diameter and short length work, the portion may be removed. After the work is completed it can be reassembled. This is known as the gap bed.

Assignment

1 What are the two purposes of lathe bed?
2 Name the material out of which the lathe bed is made?
3 Give four reasons for the above?

Assignment sheet

Objectives: At the end of this lesson you shall be able to
- **explain assignment sheet and its importance**
- **explain the elements of the assignment sheet.**

Assignment sheet

- This is like work sheet.
- In this the instructor gives effective learning devices to the learner.
- In this sheet it has the following factors.
- Problem solving
- Answering questions given in information sheet
- Write the out comes of the learning after the observation of demonstration or experiments.
- These sheets can be used in class room teaching or shop floor demonstration.
- It provides the learner sufficient learning experiences to consolidate what has been taught in class room.
- The learner attains specific objectives through a series of problems solving activities.
- Assignment sheet are the result of follow up after theory or practical lesson.
- The assignment sheet is particularly helpful in teaching science, calculation drafting etc.
- Instruction regarding all shop activities can be facilitated with this sheet.
- Usually a assignment sheet consists of a statement and explanation of the principle to be taught with examples of its application.

An assignment sheet has the following elements

- Assignment
- Objectives
- Instructions
- Procedure
- Questions

Assignment: It must have are appropriate title indicating what is assignment exactly represents. It should focus the subject in straight way.

Objectives: This should given in clear terms what the learner has to learn from the assignment.

Procedure:

- Clear instruction given in clear terms, what the learner has to learn from the assignment.
- If the instruction is too length it loses its force and effectiveness.
- The method over coming the anticipated difficulties by the learner should be indicated clearly.

Questions:

- A few selected questions, answering of which helps to fix the ideas of learner in his mind.

Reference to material:

- This may be a reference to series of questions from specific reference books (Example page 210-problems nos 11,13,18,25 etc). A simple format is enclosed for reference.

ASSIGNMENT SHEET

Trade ..... Date ....

Leson No ..... Time .....

Sylabus extract..... Name.....

I Preparation

a **Objectives:** At the end of this lesson, the trainee shall be able to

1 .....

2 .....

b Introduction

c Presentation

d Questions

e Reference

INSTRUCTIONAL MATERIAL

Theory 5.1

I Multiple Choice Question items

Choose the correct answer:

1 Which one is prepared by the instructor to class room teaching

A Syllabus

B Lesson plan

C Progress chart

D Demo plan

2 Which one of the following is prepared by the instructor for shop floor?

A Syllabus

B Lesson plan

C Information sheet

D Demonstration plan

3 What is the name of the sheet prepared by the instructor consists of objective and subjective type of questions?

A Information sheet

B Operation sheet

C Assignment sheet

D Notes of lesson

4 What is the name of the sheet which is a document typically a blank form that is designed for the quick, easy and efficient recording of information?

A Information sheet

B Operation sheet

C Check sheet

D Assignment sheet

5 What is the name of the sheet which contain all that required to enable the trainee to know "why of the job"?

A Information sheet

B Assignment sheet

C Operation sheet

D Notes of lesson

Theory 5.2

6 What is the name of the sheet that is for the development of skill?

A Demo plan

B Lesson plan

C Operation sheet

D Job sheet

7 What the term name that is obtained job task analysis with reference to the syllabus extract?

A Skill

B Unit

C Curriculum

D Lesson topic

Theory 5.3

8 What is the name of the term that it is related to the objectives of the lesson?

A Lesson plan

B Demo plan

C Assignment sheet

D Advantages of information sheet

9 What is a assignment sheet?

A Operation sheet

B Job sheet

C Information sheet

D Work sheet

UNIT - VI

TEST AND EVALUATION

Learning Outcomes to be achieved from this unit:

- **Test and evaluate the trainees using different assessment techniques.**

Different levels of learning domain according to Bloom's Taxonomy and its correlation with NSQF

Objectives: At the end of this lesson you shall be able to
- **state the concept of Taxonomy of educational objectives**
- **state the features and necessity of Bloom's Taxonomy for education**
- **list out the three learning domains and their levels**
- **define the levels of each domain with examples**
- **correlate the learning domains of Bloom's Taxonomy with NSQF.**

Taxonomy of educational objectives

Taxonomy is the process of learning and classifying things such as animals and plants into groups within a larger system according to their similarities and differences.

The Taxonomy provides a classification of educational objectives that is similar to the classification scheme used for plants and animals.

The area of education has the emergence of a number of taxonomies specifying the educational objectives.

One of the most helpful guides in identifying and defining instructional objectives is "Bloom's Taxonomy" which is developed by the committee of educators under the direction of "BLOOM" (1956), and Krathwohi (1964)

Bloom's Taxonomy

Bloom's Taxonomy is a set of three hierarchical models used to classify educational learning objectives into levels of complexity and specificity and classified into three levels.

This frame work become a Taxonomy of three domains.

- Cognitive - knowledge based domain with six levels.
- The affective - attitudinal based domain with five levels.
- The psychomotor - skills based domain with six levels.

The cognitive domain has been the primary focus of most traditional education and is frequently used to structure curriculum learning objectives, assessments and activities. These models were named after Benjamin Bloom, who chaired the committee of Taxonomy.

He edited the first volume of standard text "Taxonomy of educational objectives".

Learning teaching, identifying educational goals and thinking are all Bloom's Taxonomy -emerging perspectives on learning, teaching and technology.

After discussion during 1948, convention of the American Psychological association headed by Bloom a group of educators took the task of classifying educational goals and objectives.

They indented to develop a method of classification for thinking behaviour as important in the process of learning.

In 1956, after the group first began work on the cognitive domain was completed a hand book referred as "Bloom's Taxonomy" was published.

Bloom's Taxonomy is a multi-tiered model of classifying thinking according to size cognitive levels of complicity. These levels are depicted as a stairway, leading many teachers to encourage their students to "Climb to a higher (levels of) thought".

The lowest three levels are :

- Knowledge
- Comprehension and
- Application

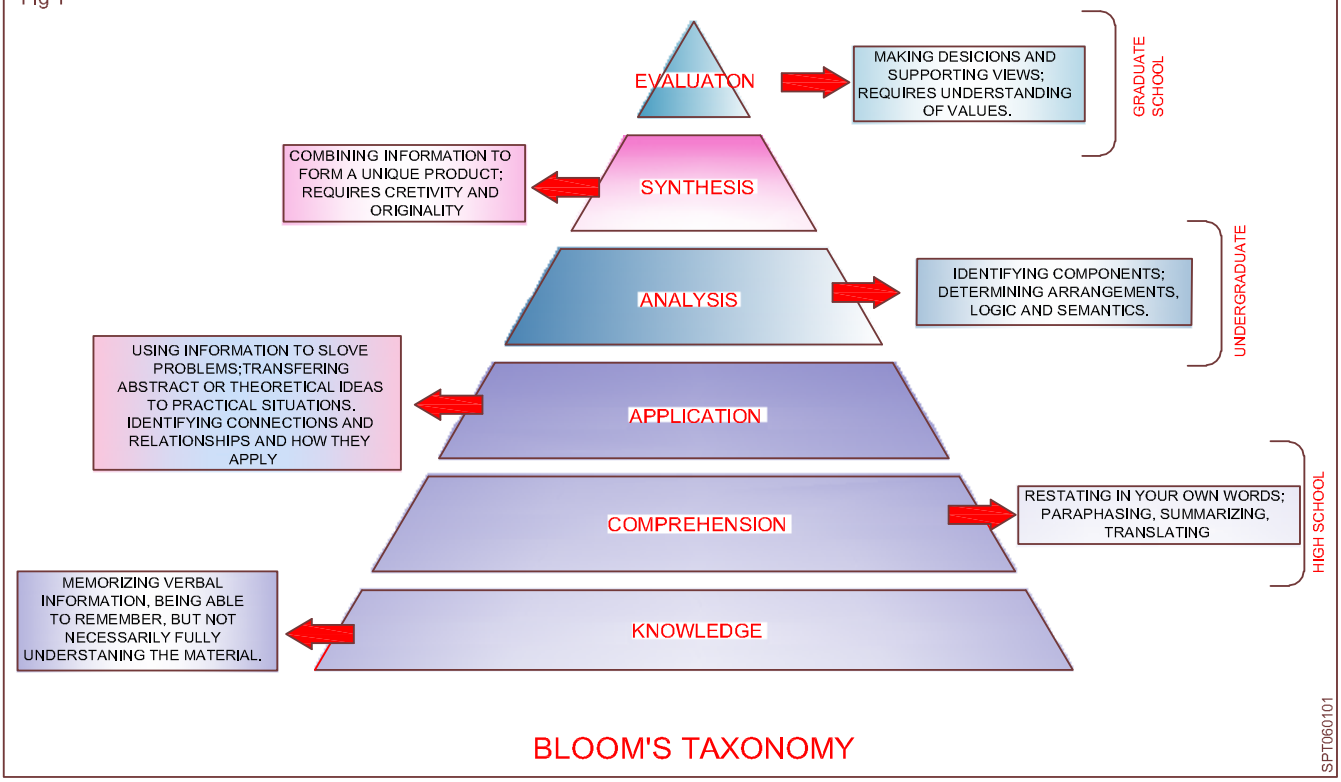
The highest three levels are

- Analysis
- Synthesis and
- Evaluation

The Taxonomy is hierarchical; in that each level is subsumed (absorbed) be the higher levels. In simple, a student functioning at the "application" level has also mastered the material at the 'knowledge' and comprehension levels.

Fig 1 shows this arrangement to natural divisions of lower and higher level thinking.

Fig 1



BLOOM'S TAXONOMY

Revised Bloom's Taxonomy (RBT)

A former student of Bloom's, Mr. Lovin Anderson and Krathwohi group spent six years to finalise and revise same with minor significant changes in the existing Taxonomy.

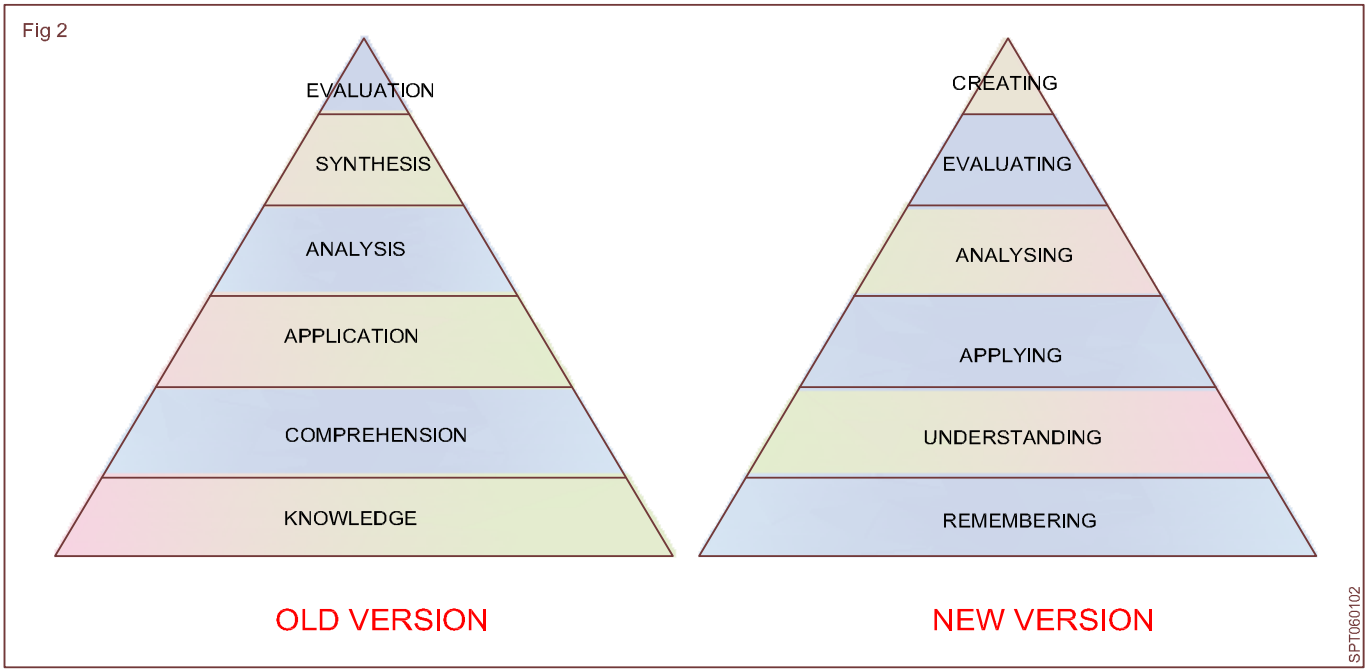
The changes occur in three broad Bloom's taxonomy - emerging perspectives on learning, teaching and technology and changes in 3 categories: (i) Terminology, (ii) structures and (iii) emphasis.

i Terminology changes

Basically, Bloom's six major categories were changed from noun to verb forms, additionally, the lowest level of the original 'Knowledge' was renamed and become 'remembering'. Finally 'Comprehension and synthesis were rettled to 'understanding' and 'creating, comparison of old and new version are shown in Fig 2.

Comparison of old and new version

Fig 2



The new terms are defined as:

i **Remembering** - Recalling relevant knowledge from long term memory.

ii **Understanding** - Constructing meaning from oral written, and graphic, messages, classifying, summarising comparing.

iii **Applying** - Carrying out (or) using a procedure through executing (or) implementry.

iv **Analysing** - Breaking material into constituent parts overall structure, purpose and organising.

v **Evaluatin**g - Making judgement, based on criteria and standards through checking.

vi **Creating** - Putting elements together to form a functional whole; reorganising elements into a new pattern.

ii Structural changes

Bloom's original cognitive Taxonomy was a one dimensional form, and in revised Taxonomy takes the form of two-dimensional table. One of the dimension identifies the knowledge and the second identifies cognitive process dimensions are given in taxonomy Table 1.

Taxonomy table - 1

Knowledge Dimension	Cognitive process dimension					
	Remember	**Understand**	**Apply**	**Analyse**	**Evaluate**	**create**
1 Factual knowledge	list	summarize	classify	order	position	combine
2 Conceptual knowledge	describe	interpret	experiment	explain	assess	plan
3 Procedural knowledge	tabulate	predict	compute	distinguish	conclude	compose
4 Meta - cognitive knowledge	Appropriate	execute	construct	achieve	action	realize

iii Changes in Emphasis

Emphasis is the third and final category of changes. Bloom himself recognised that Taxonomy was being "unexpectedly" used by counter less groups so, he made revised version of taxonomy is intended for much broader audience use it as a movement tool for curriculum planning instructional and assessment.

Necessity of the use of Bloom's Taxonomy

In this taxonomy, the cumulative hierarchical frame work consisting of size categories, each requires achievement of the prior skill (or) ability before the next, more complex remains easy to understand.

For measuring students ability accurately, teachers requires classification of levels of intellectual behaviour important in learning.

Bloom's Taxonomy provides this measurement emerging prospectives learning, teaching and technology tool for thinking.

The revised Bloom's Taxonomy provides more powerful tool to fit's teacher's needs. It provides a clear, visual representation of the alignment between standards and educational goals, objective, products and activities.

The revised Bloom's Taxonomy Table clarifies the fit of each lesson plan's purpose, "essential questions' goal (or) objective.

Today's teachers must have a plan about how to spend their class room time clear alignment of education objectives with local, state and national standards is a necessity.

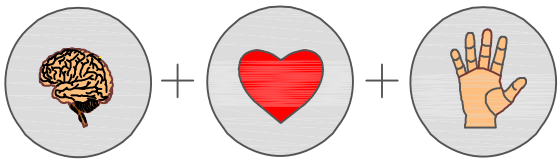
Revised Bloom's Taxonomy of learning Domains

Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr. Benjamin Bloom in order to promote higher forms of thinking in education such as **analysing** and **evaluating** than **remembering** facts.

The committee identified three domains of learning (educational objectives)

- **Cognitive** : Mental skills (knowledge) (or) (Mental ability)
- **Affective** : Growth in feelings (or) emotional areas (attitude)
- **Psychomotor** : Manual (or) physical skills (skills) Fig 3 shows the symbols for the above learning domains.

Fig 3



Cognitive domain

The cognitive domain involves knowledge and the development of intellectual skills

It includes the recall (or) recognition of specific facts, procedural patterns and concepts that serve in the development of intellectual abilities and skills. There are six major levels are listed in order below starting from the simplest behaviour in the most complex.

The first ones must be mastered before the next ones can take place.

Old version levels of cognitive domain

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Definition of levels of 3 learning domains

Cognitive domains (old)

The cognitive domain is broken into the following six levels of objectives in 2001. In the revised edition of Taxonomy the levels are slightly different.

- **Knowledge**

It involves recognizing (or) remembering facts, terms, basic concepts (or) answer without understanding its meaning. e.g. Name the seven days in a week.

- **Comprehension**

It involves demonstrating understanding of facts and ideas by organising, comparing translating, interpreting and stating the main ideas.

- **Application**

It involves using acquired knowledge - solving problems in new situations by applying acquired knowledge, facts, techniques and rules.

Students should be able to use previous knowledge to solve problem.

- **Analysis**

It involves examining and breaking information into component parts determining how the part relate one another, identifying motives or causes, making inferences such as

- Analysis of elements
- Analysis of relationships
- Analysis of organisation

- **Synthesis**

It involves building a structure (or) pattern from diverse elements, If refers to the act of putting parts together to form a whole.

- Production of a unique communication
- Deviation of a set of abstract relation

- **Evaluation**

It involves presenting and depending opinions by making judgements about information. The validity of ideas (or) quality of work based on a set of criteria.

Its characteristics are

- Judgements in terms of internal evidence
- Judgements in terms of external

Revised Bloom's Taxonomy levels of cognitive domain: Lavin Anderson revised and made some changes in cognitive domain.

Revised Bloom's Taxonomy

Create

- **Produce new or original work:** Design, assemble, construct, conjecture, develop, formulate, author, investigate

Evaluate

- **Justify a stand or decision:** appraise, argue, defend, judge. select, support, value, critique, weigh

Analyse

- **Draw connections among ideas:** differentiate, organise, relate, compare, contrast, distinguish, examine, experiment, question, test

Apply

- **Use information in new situations:** execute, implement, solve, use, demonstrate, interpret, operation schedule, sketch

Understand

- **Explain ideas or concepts:** classify, describe, discuss explain, identify, locate, record, report, select, translate

Remember

- **Recall facts and basic concepts:** define, duplicate, list, memorize, repeat, state

The revised new Taxonomy reflects more active form of thinking and more accurate.

- **Evaluation** → **Evaluating**
- **Synthesis** → **Creating**
- **Analysis** - **Analysing**
- **Comprehension** - **Under standing**
- **Knowledge** - **Remembering**

The affective domain (emotion - based)

- Receiving
- Responding
- Valuing
- Organising
- Characterizing

The psychomotor domain (action - based)

- Perception
- Guided response
- Mechanism
- Complex overt response
- Adaption
- Origination

Revised cognitive criteria domain levels are described in a pyramid structure as in Fig 4.

Fig 4

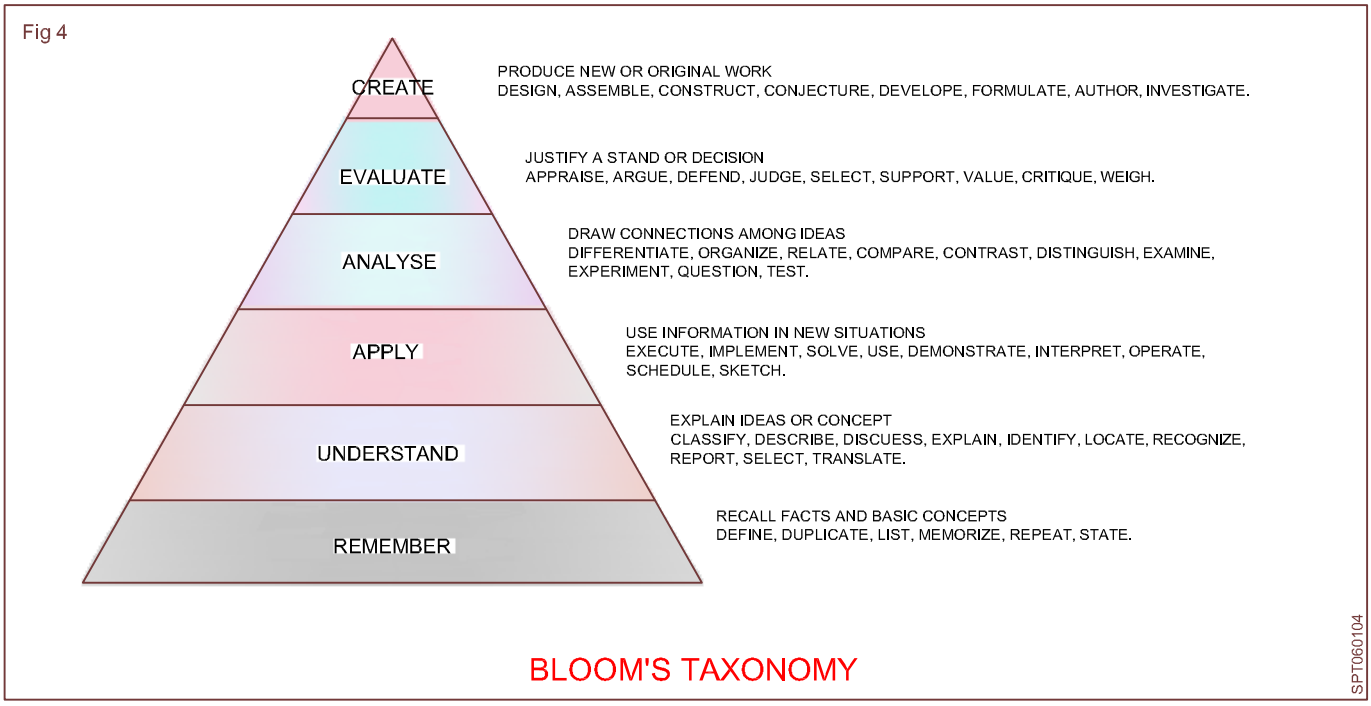


Fig 5 shows the climbing stairs from lowest objectives to highest objectives (Remember to create).

Definition of the affective domain (emotion -based) levels

Skills in this domain, defines the way people react emotionally and their ability to feel other living things pain (or) joy. Its objectives target is the awareness and growth in attitudes emotion and feelings.

The five levels in this domain moving through the lowest - order to the highest.

- **Receiving**

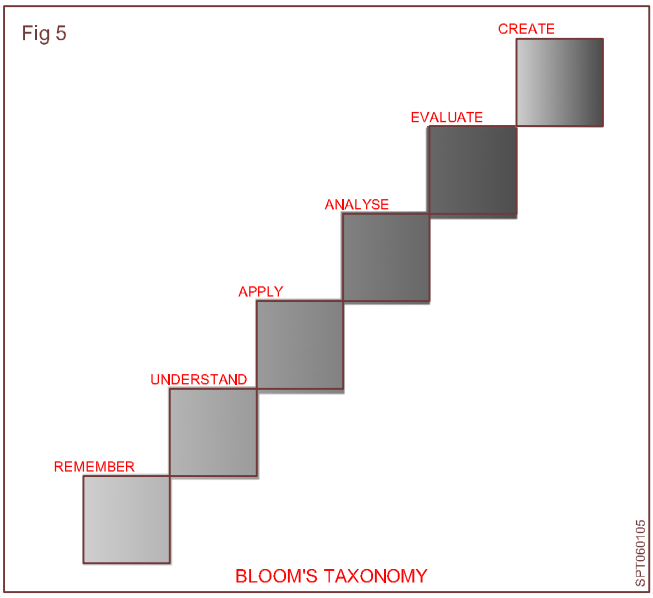
The lowest level: The student pays attention - without this level, no learning can occur. Receiving is about the students memory and recognition.

- **Responding**

The student actively participates in the learning process, not only attend to stimulers, he also reacts.

- **Valuing**

The student associates a value (or) some values to the knowledge they required.



- **Organising**

The student can put together different values, information and ideas, and can accommodate them within is own scheme and also he can compare, relate and elaborate on what has been learned.

- **Characterizing**

The student at this level tries to build abstract knowledge

Definition of the psychomotor domain's (action - based) levels:

Skills in the psychomotor domain describes the ability to physically manipulate a tool or instrument like a hand or a hammer. Psychomotor objectives usually focus on change and / or development in behaviour of skills.

Bloom's and his colleagues never created sub categories for skills in this domain, but other educators have created their own psychomotor Taxonomies and proposed for the following levels.

- **Perception**

The ability to use sensor clues to guide motor activity. It ranges from sensor stimulation through selection to translation.

e.g. Adjust the heat of the stove to correct temperature by smell and taste of food.

Keywords : Chooses, defects differentiates, distinguishes identifies, isolates, relates, selects.

- **Guided response**

The early stages of learning a complex skill that includes initiation and trial and error additional performance is achieved by practicing.

e.g. Follows instructions to build a model

Keywords : Copies, traces, follows, react, reproduce, responds.

- **Mechanism**

The intermediate stage in learning a complex skills;. Already learned responses have become habitual and the movement can be performed with same confidence and profiency.

e.g. Use a personal computer

Keywords : Assembles calibrates, constructs, dismantles, displays fastens, fixes, measures, mixes, sketches etc.

- **Complex overt response**

The skillful performance of motor acts that involve complex movement patterns.

This category includes performing without hesitation and automatic performance.

e.g. Operates a computer quickly and accurately.

Keywords : Builds, calibrates, constructs, dismantles, fastens, (same keywords as in mechanism, but with adverbs (or) adjectives like quicker, better, etc.)

- **Adaptation**

Skills are well developed and the individual can modify movement patterns to fit special requirements.

e.g. Modifies instruction to meet the needs of learner.

Keywords : Adapts, alerts changes, rearranges, reorganises, revises, varies etc.

- **Origination**

Creating new movement patterns to fit a particular situation or specific problem, learning outcomes emphasize creativity based upon highly developed skills.

e.g. Develops a new and comprehensive training program.

Keywords: Arranges, combines, creates, designs, initiate, makes, originates.

Correlation of Bloom's Taxonomy with NSQF

National skill qualification frame work (NSQF) syllabus is based on learning and assessable outcome with different levels and each assessable outcome includes number of assessment criteria (learning objectives).

Correlation of Bloom's Taxonomy domain's levels with NSQF

Sl.No	Bloom's Taxonomy domain	Bloom's Taxonomy Levels	NSQF domains	Levels	Correlated subjects
1	The cognitive domain - Revised (knowledge based)	1 Remember 2 Understand 3 Apply 4 Analyse 5 Evaluate 6 Create	1 Process (General) 2 Professional knowledge	**-Nil-** • Depth of knowledge • Breadth of knowledge • Kinds of knowledge • Complexity of knowledge	All and employbility skills Trade theory
			4 Core skill	• Basic skills involve in dextenity • Use of methods, materials, to and instruments • IT (Information Technology) Skills for that level	Workshop calculation & science and Engineering Drawing
2	Affective domain (emotional based)	1 Receiving 2 Responding 3 Valuing 4 Organising 5 Characterising	**-Nil-**	**-Nil-**	**-Nil-**
3	Psychomotor domain (action based)	1 Perception 2 General response 3 Mechanism 4 Complex overt response 5 Adaptation 6 Origination	1 Process 3 Professional skills 5 Responsibility	• Cognitive & creative skills • Communication skills • Interpersonal skills • Nature of working relationship • Level of responsibility for self and others • Managing change • Accountability for action	**All** Practical Exercise

Test and characteristics of a good test

Objectives: At the end of this lesson you shall be able to
- **state the purpose and characteristics of tests**
- **list and explain various types of testing methods**
- **list the three levels of complexity of test items and their key words**
- **state the criteria for objective type test items with examples**
- **state the characteristic of good test.**

Teaching and learning is completed by conducting tests to measure the learners achievements at every stage of the education.

Test

'Test' is defined as an unaided performance by the leaner.

It is a tool (or) yardstick to measure the learners achievements and the teacher's success.

It can be also defined as a tool (with set of questions) used to measure /assess the skills and knowledge of the learners, what they have learned are have been taught.

Purpose

- To provide basis for selection of candidate e.g., entrance test.
- To provide an incentive for promoting learners activity in a training situation.
- To check the understanding of the learners.
- To know how far the teacher has been successful in teaching.
- To classify or grade the learners.
- To encourage and motivate the learners to study.
- To revise the topics and to keep the knowledge fresh and upto date.
- To create feeling of competition.
- To guide the learners by knowing their weak points.
- To decide the aptitude of the learners.
- To help the parents to know the performance of their wards.
- To help the administration to record the performance of teachers and students.
- To success the success or failure of a particular training programme.
- To help the learners to know their position rank into the class.

Testing methods

The testing methods are broadly classified in two according to their nature and function, they are:

a Formative (Non - Standardised test)

b Summative (Standardised)

- **Non - Standardized tests (Formative)**

These are conducted by the instructor themselves and will be based on syllabus covered by them (ex. Weekly, monthly test unit). There is a possibility that they may design the question paper according to the standard and level of the students. Hence these tests are not considered reliable and certificates will not be issued.

- **Standardized tests (Summative)**

These are conducted by a recognized examining body like university, national council, board of exam, etc. The question paper will be set by the examining body and will be based on the common syllabus. This type of tests will be normally conducted at the end of the course. And the certificate will be issued to the successful candidates. These certificates will be accepted for employment .

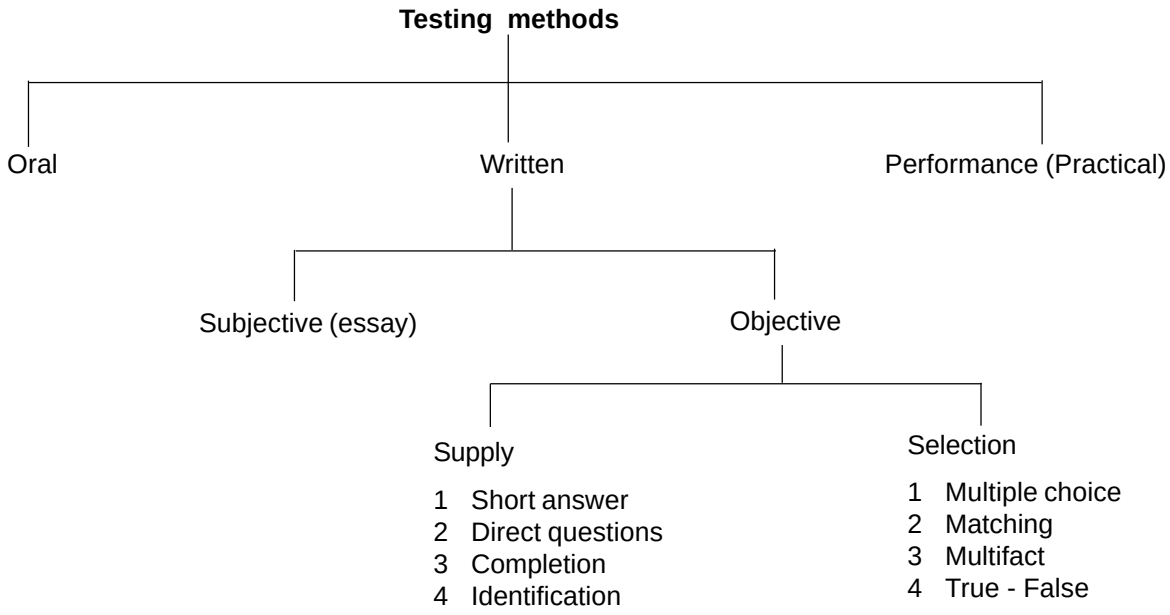
Both standard and non-standard testing methods are further classified as below:

- **Oral Test**

Oral tests are simple series of questions asked to the trainees/ students verbally and answered also verbally.

Example : "Interview" test: various types of oral test depends upon their timings/duration, i.e before, during (or) after the completion of course. Examiner must be well versed in questioning technique .

For effective use, this test should be taken as supplementary test along with written (or) practical test, not considered as a deciding factor.



Written tests

These tests are more effective than oral. The questions and answers are both in written form. Question can be spread over the entire syllabus, gives uniform assessment.

- It needs elaborate preparation and more time.
- It may affect the performance
- Permanent record of the tests can be maintained

Written tests are two types.

- Subjective (essay)
- Objective
- **Subjective (essay) type**

It is also known as 'Essay type' the questions are few and short. But the answers are lengthy.

Setting of question papers is easy, but checking takes more time.

Performance and expression of the trainee is affected by personal views and ideas of instructor / teacher.

Essay type tests are especially useful to test the quality of knowledge. It is useful to test the personality traits of an individual.

It cannot pin-point the exactness of knowledge, So trainees try to hide their ignorance under the cover of words.

It is useful to test theoretical knowledge only.

To avoid the possibility of copying student can give lengthy answer in his own words.

Questions asked generally with introductory words like:

Define, Explain, Compare, State, Describe, Discuss, Distinguish, Why what, which etc.

Objective type test

Objective type test is conducted largely, and is in common use, because, time can be saved and it offers high reliability.

If they are not properly constructed, they may be more unreliable.

Types of objective test

This tests are divided in two major categories

a Supply type items

b Selection type items

a Supply type

In this type, students/trainees are required to supply the answer to a short answer questions, (or) fill in the blanks in one words (or) are or two sentences.

- **Short answer type**

This test satisfies to some degree, the objectives of both the objectives and essay type examination. They can be given the opportunities.

The rate of answering depends on individual ability to think write quickly.

- **Direct question type test**

It is the form of a direct questions. The trainee responds by providing correct answers in a word, sentences (or) a symbol.

- **Completion type**

The completion tests consists of a statement from which some essential word has been omitted. It is also called as fill up the blank test.

Identification type

In the vocational training identification of tools is a very important factor. It can be done on the shop floor by directly explaining given the various tools for different kinds of work and the items by writing the letters or numbers marked for each item.

b Selection type test

These tests are either in the form of direct questions (or) incomplete statements. This tests, is futher divided as:

- **Multiple choice test**

In the multiple choice type, the trainees / learner is required to select the correct (or) the best response/ answer (key) from four options (one key with 3 distractors). Now, this test item is only used in All India Trade Test.

Example : What is the SI unit of work done?

A Kg/meter

B Joule

C Newton meter

D Kg-meter

The criteria's of multiple choice and other details will be explained later.

- **Matching type**

This type of test consists of two sets of items in parallel columns are to be matched. One column is called **premises** and other column is called **responses** (In response column must have more than one number item of premises) (ie) 3: 4 (or) 4 : 5.

The trainees /students are required to match 3 premises to 4 responses, so that for any one premises must match with 2 responses.

Examples

Match the responses to corresponding premises.

Match the units to the corresponding terms / quantities

Column A		**Column B**
1 Work	A	Newton
2 Power	B	Joule
3 Energy	C	Kg-m/Sec.
4 Force		

Key

1 B 2 C 3 B 4 A

- **Multiple facet type**

This test item also refer to a number of multiple choice gives one below the other relating to various aspects at the same theme presented as a material.

- **True - False type**

This test consists of a series of statements which are to be marked as either right or wrong (True or False)

It is one of the easiest test to make and probably largely and widely used. But it is unreliable, so some students are unable to secure marks/ score as they same in others.

1 HP (metric) unit is equal to 746 Watt.

(True (or) false) T / **F**

Performance test (Practical test)

Performance test is another name of practical test that measures the level of skill attainment are to be evaluated so, the jobs (or) exercises should be designed to make the students apply his knowledge and demonstrate his skill.

Level of complexity of test item

Difficulty and complexity are important factors that occur in every test questions.

These two factors will also affect the reliability of the test. Hence difficulty and complexity must be considered by educator during preparation of the test questions.

Complexity

It is defined, as the levels in Bloom's Taxonomy.

Difficulty: It is represented by the preparation of the students scoring between score with internals.

Difficulty is based upon the amount of effort needed to answer a question, solve problem (or) complete a task.

Such question (or) task are defined as easy or hard and determined by how many people can answer this question successfully.

Complexity relates to the level of thinking, action and knowledge need, in order to answer a questions, solve a problem (or) complete a task and how many different range. It leads after challenge and engage students to demonstrate of the higher levels of Bloom's taxonomy.

3 Levels of complexity of questions

There are 3 levels are followed for preparing questions for All India Trades test to ITI trainees.

They are:

Level I - Facts Knowledge / Recall memory

Level II - Functional understanding /principle transfer knowledge

Level III - Problem solving

Level - I Fact knowledge/ Recall memory

It is limited with fact knowledge which skilled worker need to understand about isolated fact of names and construction of the equipment /tool/instruments and with supporting factors (formula, specification etc.) This can be learned without requiring any understanding.

Action verbs : Parts- names, types - definitions - standards, symbols - units- specifications - materials - formula, ranges - etc.

Example -1

- What is the unit of current?

  A Ohm

  B Ampere

  C Volt

  D Watt

Key : **B**

Level - II

Principles and transfer knowledge (thinking and reasoning ability)

It is limit with knowledge of a skilled worker need to know to do his job in a professional way. Here transferring fact knowledge is more important to apply for doing the job. It covers functional understanding of equipment and processes in the proper working conditions, Comparisons between concepts and rules are their interlinkages are addressed in this level.

Action verbs

Comparison- differences - advantages- disadvantages - operation methods- functions - calculations - uses - relation - purposes - processes - procedures - application selections - benefits - sequence settings - necessaries - merits - demerits -preparation- techniques - results - rules.

Example

- Which type of single phase motor is used in ceiling fan?

  A Capacitor start induction run motor

  B Capacitor start capacitor run motor

  C Permanent capacitor motor

  D Repulsion motor

Key : **C**

Level - III Problem solving

It is limit with things and processes that went wrong (or) might go wrong. These items deal with defect symptoms and require linkage to causes or to the planning of remedial measures.

Action verbs

Problems - defects - remedies - solutions - situations - repairs - failure- analysis - causes- effects- faults- adjustments - preventions.

Examples:

- **Belt drive - defects**

  In a 'V' belt drive the defect of belt whips excessively caused by pulsating load on the drive.

  What arrangement can be povided to eliminate this defect?

  Give the brief answer

Key : **Provide fly wheel**

Criteria for objective type test items

The following objective type of test items (70%) were followed for All India Trade test (AITT) along with descriptive type (30%) upto 2012.

Objective type test items

1 Short answer

2 Multiple choice

3 Matching type

Presently multiple choice test item only followed for AITT, with 3 levels of question.

Short answer types

Short answer test items are supply items in which the candidates are expected to supply the answer. The short question is so designed /framed that it must have only one specific answer.

Wide scope essay type questions can be narrow downed into number of short answer questions, which must have only one specific answer (NOT more than 5 words).

Structure of short answer type

If consists of

a Stem / situation - (description)

b Question

c Illustration to support the situation (If required)

d Direction (ie) give brief answer

Answer :

a

b

Key : (With instructors guide)

Example: 1

External thread cutting by die

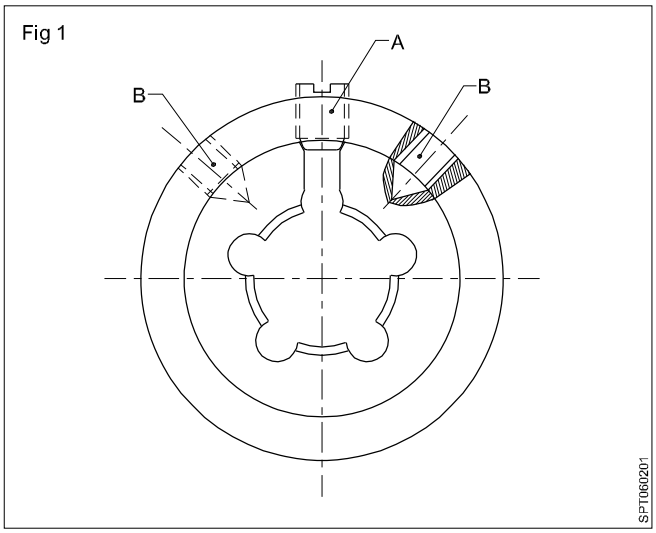
The figure below is of a split die held indie-stock

What is the name of the screws A?

Give a brief answer

Key : Grubscrew

Fig 1



Criteria for short answer

- Question should be precise and understandable.
- If should be direct
- If it is in direct high light the indirectly meant ward with bold or underlined.
- Question should mean to give exact answer
- If should be relevant
- Work related
- No highlighting of some facts and asking remaining facts
- No two objective questions allowed eg. Increase, decrease
- No true (or) false
- Abbreviation and symbols must be as per BIS
- The question should not be asked to give more than one answer
- Key answer should not be more than five words.

2 Matching answer type

It is also a selection type item. It can be considered in another variation of multiple choice test item.

Matching test item question is considered much easier than the multiple choice item, because there are No distractive answer.

In this type one has to select the correct answer from the alternatives/ choices provided.

It is very useful to test homogeneous element with simple relationship.

Structure

- Direction and instruction
- Matching item consider of a series of item, called
- **"Premises (or) statements"**
- Series of alternative answer called **"responses (or) options"**
- The premises should be larger than responses.

Examples

Level - 3

External thread cutting by die

Match the causes with the defects given below while forming the external thread with split die and die stock.

Causes

1 Die is blunt

2 More force without reverse

3 Die holding screw not properly tighened

4 Split screw is not correctly tightened

Defects

a Die slip

b Hard to rotate

C Die get heated

Key

1 **B** 2 **C** 3 **A** 4 **B**

Criteria for matching answer

- Description / stem is not compulsory unless if it is necessary.
- Matching condition should be compulsory and should clear (what to be matched with what).
- Premises and responses should have clear heading.
- Premises should always be named with numerical and responses with alphabets.

- Longer sentences should always be under premises and shorter sentences should be under response.
- Responses should be one number less than compared with premises.
- Illustration (graphics) should always be under responses.
- Out of all responses one response should be matched correct to two premises.
- Numerical symbol, standard formula should be under responses.
- Number of option should be minimum 3 (or) 4 (ie) 3:4 (or) 4:5
- Work related content only should be asked.

Mutiple choice test item

This type is only used for All India Trade Test, presently it is a selection type question. This is very popular objective type test. In this type, a statement is given and to complete it meaningfully, 4 alternatives are given (one is key, other 3 are distractor).

The student has to select the best answer and complete the statement. Normally the response is given by writing letter of the chosen statement in front of the number of the statement.

Structure of multiple choice

- It consists a statement (or) situation description which is called STEM (if required)
- And then question is present which is followed by number of choices , also called 'Alternative (or) Option's
- The selected answer is known as "KEY" and the remaining ones are called "Distractors"
- Below this direction is given as "Choose the correct (or) best answer"

Structure of Multiple Choice

STEM - Consists of information and question

Answer field consists of

- 3 alternatives and one key
- Direction - Choose the correct answer (or) choose the best answer

Answer field

A	B	C	D

Key

A	B	C	D

Example

1 Holding device for drilling in round bar

Choose the best device to hold and locate a round bar for drilling.

A Adjustable locator

B 'V' block

C Pins locator

D Wedge type location

Choose the correct answer

Key : **B**

Criteria of multiple choice item

- Among the four choice, three should be distractive answers and one should be the correct answer and these three distractive answers should close to the correct answer.
- Distractive answers and correct answer are to be named as A, B, C, D only
- Distractive answers should have close relevance otherwise it is easy to differentiate the correct answer.
- Distractive answers should be in short form and not more than maximum six words.
- If distractive answers are sentences, they should be arranged in a uniform way either bigger to smaller (or) smaller to bigger.
- If distracter are numeric value, they should be arranged in a uniform way either highest to smallest (or) smallest to highest.
- Key should not be different in content (or) wording.
- All the above, none of the above, should be avoided.
- No clues in wording like always/never etc.,
- Both (A & B) or (C & D) to be avoided.
- If the stem is in the form of the question, it should be with the question mark symbol and the alternatives should always start in capital letters.
- If the stems is in the form of an incomplete sentence, the choice must be ended with a period and the stem should not have any punctuation marks.
- If it is an incomplete sentence, the first word in each alternative should start with small letter, and each choice should end with a period. (Except : Noun)

The table shows the all 3 types of test items format for easy to reference

Short answer items

Stem: Situation question

Illustration

Answer field
a _____
b _____

Matching items

Direction: Matching condition of content

Heading: Premises

1
2
3 **Premises**
4

Heading: Options

A
B **Options**
C

Matching Conditions

Only once or more than once

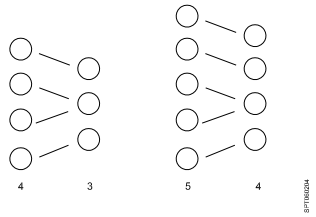
Multiple choice items

Stem: Situation question

Illustration

Answer field
A
B
C **Answer field**
D

Maximum two answers are possible



3 distractors and one answer correct or best

Characteristic of a good test

A good test must have the following characteristics

Validity

The test must be based on the subject matter taught in the course, and valid for a particular situation

Reliability

The test should be able to accurately measure the grasp of the learners to the standards the test is set for the consistency.

Objectivity

The test should be designed to keep out personal opinions of examiners. If the answer papers are checked by different examiners the results should not vary more than 5 to 10%.

Discriminative

The test results should be clearly indicate the best and worst among students. It helps the teacher to classify the students in the class.

Comprehensive

The test paper should spread over the entire syllabus. This enables the teacher to know which topics can be understood well and are not.

Ease of marking

The test should reasonably direct and simple and easy to mark.

Definite

The questions should be such that there is only one single correct answer.

Visibility

The test should be easy to administer and easy to check.

The following points to be considered for a good test

- Statement or problems used in questions must be clear and has a definite meaning.
- Test questions should be prepared to measure the application ability of facts, principle rather then to memorize and recall.
- Test should be valid and reliable at different times and under different situations.
- Test must be easy to use, easy to administer and require minimum time to answer
- Before including a question in a paper, you must answer the same yourself, within the time limit set. If you can not answer, do not include them.
- The correct answer to any question should not be in the form of another question.
- Equal time must be given to all questions having same scores.
- Several number good test can be conducted to have more practice for answering.
- It should be relevant to test and suitable for final trade test.
- Use maximum illustration and should be clear.
- No highlighting of specific facts and asking for some other factor.
- Abbreviation and symbols must be as per BIS.
- Avoid using words such as mostly, frequently, easy, different etc. In question form.
- The ever changing non-standard information are not be asked.
- Key should not be different in content (or) wording.
- If the stem is in the form question. It should be with the question mark symbol and the alternatives should always start with capital letter.

Evaluation of theory and practical test, kirkpatrick evaluation model

Objectives: At the end of this lesson you shall be able to
- **distinguish between test, assessment evaluation and validation**
- **state the importance of analysing the test result**
- **explain the evaluation of theory and practical test**
- **describe Kirkpatrick evaluation model.**

Test, and evaluation assessment

Test

A test is used to examine learners knowledge of something to determine what he /she knows or has learned. Testing is a tool measure the level of skill (or) is a tool knowledge that has been learned.

Assessment

It is the process of documenting knowledge, skills, attributes and beliefs, usually in measurable terms.

The goal of assessment is to make improvements, in an educational content. Assessment is the process of describing collecting, recording, scoring and interpretive and information about learning.

Evaluation

It is defined as the process of making judgements based on criteria and evidence.

Validation

The terms 'validation' and evaluation are important when designing training. The validation is an essential feature, and it will be your responsibility to include appropriate validation measures important, but is often done by management. The validation is furtherly classified as 'Internal' and “external” validation.

Internal validation

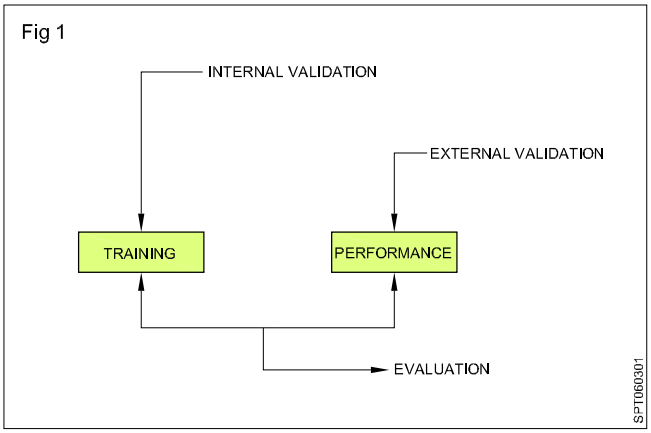
A series of tests and assessment designed to ascertain whether a training programme has achieved the behavioural objectives specified.

External validation

A series of tests and assessments designed to ascertain whether the behavioural objectives of an internally valid training programme were realistically based an accurate initial identification of training needs in relation to the criteria of effectiveness adopted by the organisation.

The relationship between these three terms (Evaluation, Internal and external validations) is illustrated in Fig 1.

Fig 1



Note the essential part, that any system is developed for evaluating training needs to incorporate procedure obtain information about the validity.

The importants of analysis of tests results

- The importance of systematic evaluation of a test.
- It is an acceptable fact that no training programme is completed without evaluation .
- It is not just enough if the teacher conducts a test by designing a question paper well and does not evaluate it.
- After completion of the test it is very much necessary and important to evaluate the test systematically.
- Through evaluation, the achievement of the students can be measured and at the same time the success and failure of the training programme is also measured.
- It shows as a feedback for both the trainer and the trainees.
- Both of them can make improvement if found necessary.
- After evaluating the test paper it is very much necessary and important to analyse the results of the tests. This analysis will help the teacher to inform the students about their progress and improvement.
- It also helps her to decide what course of action is to be taken, in order to bring all the students of class for the required standard. For the students it helps them to know their drawbacks, so that they can take required measures.

Following information can be obtained by analyzing the test result

- The difficult value of question asked in a particular test can be found out.
- If students score good marks in all subjects we can assume that the items are very easy.
- If most of the students not attended a particular question, it can be concluded that part was either away from the syllabus or has not been understood by the students.
- After analysis the test result, classification of the students will be possible.
- It is easy for giving ranks for students.

Types of evaluation

Evaluation is normally divided into two types.

Formative evaluation

This evaluation (internal evaluations) is a method for judging the worth of a programme while the program activities are forming (progress). They can be conducted during any phase ADDIE process.

The formative evaluation are basically done on the fly. It main purpose is to catch deficiencies ASAP, so that the proper learning interventions can take place and allows the learners to master the required skills and knowledge. It is useful in analysing learning materials and achievement of students, and teacher effectiveness.

Summative evaluation

This evaluation (external) is a method of judging the worth of a program at the end of the program activities (summative) it focus is outcome. All assessments can be summative functions (ie) have the potential to serve a summative function that only some additional capability of serving formative function.

The most important feature is the guidance given for the completion. All instruction should be clearly stated.

It concludes formative evaluation is conducted during the development (or) improvement of perform Summative involve making judgments about the efficiency of a program at its conclusion.

Theory based evaluation

It is an approach to evaluation (completed analytical model) and not a specific method or technique. It is a way of structuring and undertaking analyses an evaluation.

Principle of evaluation

It is a systematic process of determining to what extend the instructional objective has been achieved.

Therefore evaluation process must be carried out with effective techniques.

Evaluation method of theory test

A test (or) assignment used for theoretical subjects may consist of a number of objective test items with a few subjective items.

The instructor will allot full marks to the correct answers of objective items and no marks to the incorrect answers.

In the case of subjective items, the instructor has to necessarily make a subjective judgement and consider the range of performance and allot marks accordingly.

An approach of evaluation of practical test (Performance test)

While evaluating trainees performance abilities, the instructors have to take into account not only the final product but also the method of performance and other attributes which will contribute towards the development of correct work habits.

It means, the instructors have to make both objective and subjective assessment while evaluating training jobs.

The practical (performance skill test) tests consists of different features, which are similar to the theory test items. For features which stipulates certain specific standards performance as a given below should be made.

The performance test features are:

- Abilities to handle tools and equipment
- Selection and economical use of materials
- Ability to read drawings
- Observing safety and good work habits
- Speed of work
- Accuracy
- Quality of workmanship
- Attitude towards work
- Correct sequence in performance
- Neatness in workmanship
- House keeping

In the case of the above features and other attributes, the range of performance 'has to be' judged and recorded as they involve subjective measurement.

Method of evaluating practical test as per NSQF syllabus

The method adopted for assessing the trainees performance in exercises is different when compared with practical test.

Keeping in view the requirements of performance skills independently on the job, the following criteria are to be taken into account for evaluation of practical tests.

a Organisational ability (Attitude features) - 20

b Method of doing work (Performance) (Objective feature) - 30

c Quality product making (Subjective feature) - 50

d Time

Method of evaluating each criteria

a Organisational ability (Attitude features)

This is the ability of planning performance in order to accomplish the job as required.

The ability to organise can be tested by asking the trainee to write the procedure for accomplishing a work, name the tools, equipment and materials required for the same, calculation involved, interpretation of symbols and drawing the required result automatic diagram.

b Method of doing work (Performance) (Objective feature)

The method of doing a skill work would include the following aspects.

- Interpreting the schematic to actual connection.
- Selection of tools for specific application.
- Correct use of tools
- Economic use of materials.
- Following the essential steps in skill performance.
- House keeping
- Observation of safety

Evaluation of this factor is made by the instructors for doing this..

c Quality of product (Subjective feature)

The evaluation of the quality of a product is based on it's functional requirements.

The aspects assessed are:

- Dimensional features
- Functionality (correct connection, movement, manipulation)
- Other features of the job which need subjective judgement.

Weightage for each aspects is to be given according to the complexity of the performance, and the critically of the features in respect of the functional aspects of the job.

d Time

The time taken by the trainees during the test has to be taken into account, as speed is an important aspect. The factor to be considered is whether the trainee has taken less or more than the allotted time and it should be expressed as a % of the time allotted for doing the exercise. Weightage or deduction of the marks should be made accordingly.

Awarding marks for time

All exercises included in the programme have the time estimated and indicated in the drawing. These timings are based on the judgement of the media developers and the information supplied, after completing prototypes of the exercises and the feed-back after conducting the trials.

No separate marks are allotted for the time factor. An extra time up to 30% may be given for enabling the trainees to complete the exercise, if necessary. Due weightage should be given by allotting marks for any saving in time or by deducting marks if extra time is taken.

It should be noted that no weightage in marks should be allowed unless the trainee has secured 70% marks for the other aspects of the exercise.

Suggested scale

Extra time taken (+)	Time saved (-)	Marks (for a total of 100)
+10%		-3
	-10%	+3
+20%		-6
	-20%	+6
+30%		-9
	-30%	+9

The marks awarded including the weightage for time should not exceed the total marks allotted. The following scale is suggested for awarding marks for time.

Distribution of marks for practical tests

As an example, In Electrician trade the practical tests result in some products. The capability of learners in performing the skills can be to a greater extent evaluated by the quality of the product and this aspect should be taken into account while determining the weightage of marks for different criteria.

The following weightage is suggested - for the test paper consists of 3 questions.

Organisational ability - Writing the procedure, requirement of tools, equipment and material	20 marks X 3
Method of doing the work - As marked using performance observation criteria	30 marks X 3
Quality - Product making	50 marks X 3
Total	**100 marks X 3**
	300 Marks

Model Practical Examination Question Paper

Total marks : 300

Time : 8 hrs

1 Write the tools, material required into specification and also procedure steps in sequence to make a 'T' (Tee) joint in a 7/20.

2

a Draw the circuit diagram to verify the relation between line with phase voltages and line with phase currents in 3 phase star and delta connection using ISI symbols.

b Write the tools, instruments required with specification and also into the procedure steps.

c Make the connection measure the voltages and currents in the above and verify their relations.

3 Verify the characteristics of Series and Parallel Circuit.

a Draw the circuit diagram for the Series and Parallel Circuit.

b Write the required tools, instruments and materials with specification.

c Verify the characteristics of both circuits.

Model practical examination evaluation scheme

1 **(100 Marks)**

S.No	Objective Features	Marks 30	Score of marks for roll no.
1	Tools and material requirement	10	
2	Drawing the object	10	
3	Procedure	10	

S.No	Subjective Features	Marks 50	Score of marks for roll no
1	Dimension	10	
2	Skinning	10	
3	Making joints	10	
4	Uniformity and closeness of furns	10	
5	Finishing and workmanship	10	

S.No	Attitude Features	Marks 20	Score of marks for roll no.
1	Safety	5	
2	House keeping	5	
3	Initiative	5	
4	Co-operation/(Viva)	5	

2 **(100 Marks)**

S.No	Objective Features	Marks 30	Score of marks for roll no.
1	Tools, instruments and material requirements with specification	10	
2	Proper usage of materials	10	
3	Circuit diagram and procedure	10	

S.No	Subjective Features	Marks 50	Score of marks for roll no.
1	Handling of tools	10	
2	Correct connection with harnessing	20	
3	Measure the reading	10	
4	Verification of relationship	10	

S.No	Attitude Features	Marks 20	Score of marks for roll no.
1	Safety	5	
2	House keeping	5	
3	Initiative	5	
4	Co-operation/(Viva)	5	

3 **(100 Marks)**

S.No	Objective Features	Marks 30	Score of marks for roll no.
1	Tools, instruments and material requirements with specification	10	
2	Economic usage of materials	10	
3	Circuit diagram and procedure	10	

S.No	Subjective Features	Marks 50	Score of marks for roll no.
1	Preparation and draw layout	10	
2	Fixing of accessories	10	
3	Making connection	10	
4	Reading and recording the measured value	10	
5	Observing the characteristics	10	

S.No	Attitude Features	Marks 20	Score of marks for roll no.
1	Safety	5	
2	House keeping	5	
3	Initiative	5	
4	Co-operation/(Viva)	5	

Kirkpatrick evaluation model

Kirkpatrick model

It is probably the best known model for analysing and evaluating the result of training and educational programme.

It takes into account any style of training both informal (or) formal to determine aptitude based on four levels criteria.

Kirkpatrick four levels model:

The Kirkpatrick four level training evaluation model helps trainers to measure the effectiveness of their training in objective way.

This model was originally created by **Donald Kirkpatrick** in 1959, and since has gone through several updates and revisions. This model was then updated in 1975, and again in 1993.

The four levels are:

- Reaction
- Learning
- Behaviour
- Results (Impact)

Level 1 - Reaction

The level measures how your trainees reacted to the training. Its important to measure reaction because it helps you understand how well the training was received by your trainee and it improves.

The training for future of trainees, including identifying important areas or topics that are missing from training.

Obtaining feedback from trainees about the quality of training they have received is important. Their opinions about the content, pace, methodology, tutorial support, learning material and the facilities available are essential components in monitoring and improving the 'quality' of training. The basis for obtaining this information is by using 'Immediate Reaction Questionnaires'.

Level 2 - Learning

You measure what your trainees how much has their knowledge increased as a result of the training.

It is important to measure, what your trainees are learning and what they are not knowing and it will help you to improve future training.

The purpose of training is to organise learning on the behalf of a person so that they can achieve specified objectives. The outcome of this process is to assess the person's acquisition of knowledge, skills and attitudes relevant to their needs. This can be done using formal tests or with a less intrusive form of assessment. Examples of assessment techniques include:

- Objective tests
- Simulations
- Performance tests
- Assignments and projects
- Checklists
- Interviews
- Observation

Level 3 : Behaviour

In this level, you evaluate how for your trainees have changed their behaviour based on the training they received, (i.e.) how trainees apply the information. They are:

- Current job description
- Specific tasks or competences
- Standards of performance
- Performance targets
- Categories of knowledge - principles, concepts, facts, procedures, etc.
- Categories of skills - manual, interpersonal, keyboard, problem solving, etc.
- Indicators of attitudes

Level 4 : Results (Impact)

At this level, you analyze the final result of your training. This includes outcomes that you (or) your organization have determined to be good for the employees (or) good for the employers (or) good for bottom line.

Fig 2 shows the Kirkpatrick model of 4 steps of evaluation steps of learning (earlier approach)

Fig 2

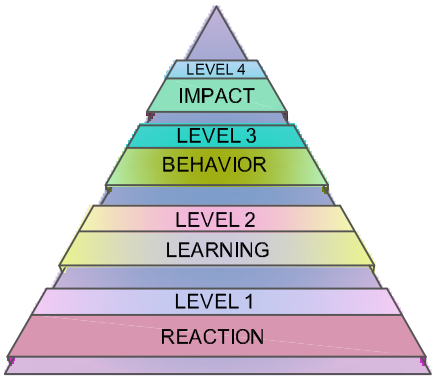


Fig 3 shows the Kirkpatrick revised current apporach of Kirkpatrick 4 steps evaluation steps of learning with chain links.

Fig 3

CURRENT APPROACH: CHAIN OF EVIDENCE

LEVEL 1 REACTION | LEVEL 2 LEARNING | LEVEL 3 BEHAVIOR | LEVEL 4 IMPACT

SPT060303

Use of the Kirkpatrick model for training evaluation

Level 1 : Reaction

Objective : At this level, the focus is to determine the learner's reaction to the training. Today, we have wide-ranging options through Learner Analytics to identify if the learners liked the training if they found it useful and if they would be able to apply the learning.

From an evaluation perspective, this feedback enables L & D (Learners and Development) teams to assess if they are on track or if any further changes are required.

Level 2: Learning

Objective : At this level, the focus is to determine what was learned or gained (this should be attributable directly to the training). It includes

- Knowledge gain
- Acquisition of a new skill
- Further proficiency gain on an existing skill
- Behavioural change

The pointers from this stage of evaluation would point to:

- The need for further training
- The need to supplement formal training with other measures that could include performance support intervention or mentoring/coaching.

Level 3 : Behavior

Objective : At this level, the focus is to determine if the learner behaviour changed (again, this should be attributable directly to the training).

From an evaluation perspective, this feedback enables L & D teams to assess if there was a demonstrable change in the learner's behaviour.

Often, this is can be tricky. Although, learners had successfully cleared the assessment, yet there is no demonstrable change.

This may need re-assessment to determine why this is not happening.

Sometimes, it could be because learners have no opportunity to demonstrate what they learned, and often, it may point to the need for reinforcement.

There may be a need to have refresher programs to be offered over an extended period of time till the required gain is observed.

Level 4 : Impact (Result)

Objective: At this level, the focus is to determine if the business saw the gain and if the required impact was created on account of the training.

From an evaluation perspective, this feedback enables L & D teams to review if the expected impact identified during the TNA phase indeed happened.

Model Questions

Theory 6.3

9 Which term is defined as the process of documenting knowledge and skills?

A Evaluation
B Assessment
C External validation
D Internal validation

10 What is evaluation?

A The process of making judgement with evidence
B Series of test and assessment to ascertain the achievements
C Examine learners knowledge of something
D The process of describing collecting information about learning

11 What is principle of evaluation?

A Systematic analysis of test results
B Systematic process of determining to the instructional objectives achivements
C Way of structuring and undertaking analysis
D Process of analysing learning objectives

Principles of Teaching Test and Evaluation — Theory 6.4

Rules for preparation of objective type tests

Objectives: At the end of this lesson you shall be able to
- **distinguish between subjective and objective test**
- **state the advantages and disadvantages of objective type test**
- **list out the types of objective type test**
- **explain the structure of multiple choice test item**
- **enumerate the rules for preparation of objective type test item**
- **explain the use of test profile and mind map preparation.**

The main classification of tests are -

- Oral
- Practical (or) performance
- Written test

Written test is further classified into two

- Subjective and
- Objective type test.

Subjective test

The subjective type is also called as 'essay type test'. Normally the questions are few, and short. But the answers are length. Setting of question papers is easy, but evalution takes more time.

Performance and expression of the student, is affected by personal views and ideas of the teacher.

Objective test

An objective test is a test that has right or wrong answers and so can be marked objectively.

Objective tests are popular because they are easy to prepare and take, quick to mark and provide a quantifiable and concrete results.

There is no need to have command over language etc.,

Every question has one definite answer, so scoring is easy and uniform. But it requires great skill on the part of the teacher to design the test.

Advantages of objectives test

- Scoring is uniform as personal opinion in grading is eliminated.
- There is only one correct answer to every question.
- Grading is easy with the help of a key prepared in advanced.
- A wide range of subject matter can be covered.
- The students have to study the entire syllabus in great detail.
- Quality of language, handwriting etc., does not affect the marks obtained.
- Checks exactness of knowledge and quick thinking.
- Easy for student to score high marks.

Disadvantages

- Answers are open to guessing.
- Difficult to design. The teacher has to be very careful in designing the paper. there should be no repatition, no clues to the answer and no doubt of correctness of the answer.
- Chances of copying are more.
- Quality of knowledge cannot be tested.
- Not useful for advanced students.
- Not useful to show personality traits.

Types of objective test items

- Matching test
- Multiple choice test
- True or false test
- Correct/ incorrect test
- Simple recall test
- Best answer test
- Completion test
- Identification test

Among the above objective test items, **The multiple choice** test item is widely conducted for measuring skill and knowledge of the students/ trainees.

The multiple choice tests are best adapted for testing well defined (or) lower order skills, problem solving and higher order reasoning skills are better assessed through.

The purpose of a multiple choice item is to measure candidate ability with regard to a specific content area.

Structure

Multiple choice item consists of a problem, known as stem, and a list of suggested solution, known as alternatives. The alternatives consists of one correct (or) best in the answers (key) and incorrect alternative is known as distractor.

The student has to select the best answer and complete the statement.

The four alternatives includes key are represented by the alphabet A,B,C and D.

- Stem - consists of informations and questions.

Answer field consists of .....

A ----------
B ----------
C ----------
D ----------

3 alternatives and one key

- Diection - choose the correct answer (or) best answer

Answer field

A ☐ **B** ☐ **C** ☐ **D** ☐

Key

A ☐ **B** ☐ **C** ☒ **D** ☐

In All India Trade Test conducted by Directorate General Training (DGT), for all ITI's, the above structure of multiple choice question are prepared for written exam, such as Trade theory, Workshop Calculation and Science, Engg.Drawing and Employability skill papers.

The criteria's for multiple choice questions are already explained in Lesson 6.2 in detail.

Rules for preparation of objective test

Preparation for objective type test, the two important steps are involved.

- Planning
- Preparation

Planning: The test must be planned in advance by considering the following points.

- The class for which the test is to be prepared
- The convenient time/ date available for the test
- The subject and the units for which the test is intended
- The types of questions and items to be planned
- The scoring procedures to be adopted
- The nature of analysis and interpretation of score.

Preparation

An objective test to be prepared by an instructor. It is a testing of trainees ability to assess the desired behaviour in related subject (or) content (or) performance. There are two important aspects for the end of term tests are .....

- The type of things the trainee should be able to do (abilities)
- The subjects matter in which he should be able to do them (i.e. content)

By analysing both the above for a particular situation, a chart/ table can be prepared.

Content

To arrive at the important areas of syllabus and the weight to be given to that area in the examination, the points given below can be considered.

- What extent this area is necessary for understanding the other areas and the syllabus.
- Whether the students/ trainees make use of the material in this area in his job / day life economically.
- How many periods have been allotted for teaching the particular unit?

Preparation of Good Question Paper

Preparation of a good question paper requires proper planning. The question paper must be prepared on a multi dimensional basis are ....

- Objective to be tested
- Content to be covered
- Types of questions to be used
- Number of items to be included

The last two factors are interdependent. The number of questions must depend upon the kinds of questions to be used.

The number of questions in a paper must be divided with different levels of complexity (3 levels).

Now, multiple choice questions only asked. For engineering trades 50 questions are asked in 3 levels, and each question carriers 3 marks.

In a theory question paper, 3 levels are distributed in all topics as follows

Level -1	-	30%	(i.e.)	15 Questions
Level -2	-	50%	(i.e.)	25 Questions
Level -3	-	20%	(i.e.)	10 Questions
		Total		50 Questions

Before preparation of question paper the paper setter must consider and keep in their mind, the points given below.

- Numbers of compulsory questions to be answered
- If you give choice, specify in easy understandable language
- Give the scores for each questions and parts of questions
- Provide time for the paper
- Never ask tricky questions
- Prepare a key before the test conducted.

Test profile

For preparing objective type test question paper, test profile must be prepared.

Functions of test profile

- It guides and monitoring of test item development
- Ensuring content coverage of test paper (validity, reliability)
- Ensuring paper setting as per predetermined profile
- monitoring and balancing at question bank development as per profile
- Providing uniformity and transparency in paper setting procedure.

Fig 1 shows the sample test profile for preparing question bank in NIMI. It gives idea about profile.

Previously upto 2012, before introducing semester system in ITI's the objective and subjective type of question papers are prepared and tested in All India trade test.

In that Trade theory questions paper includes,

- Short answer
- Multiple choice
- Multiple type
- Calculation and

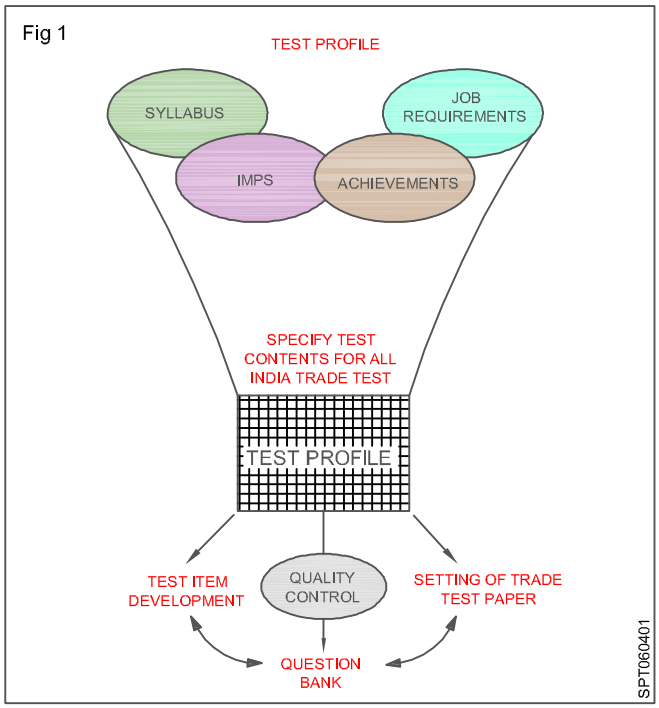
} objective (70%) type

- Essay (subjective) - 30%
- For objective type

Level - 1	-	25%
Level - 2	-	50%
Level - 3	-	25%

In 2013, semester system introduced, the syllabus are revised, the objective types test is conducted only with multiple choice test item of 50 questions 3 marks allotted for each questions.

Fig 1



For considering, the below average, average and above average trainees, the question papers are prepared with 3 levels of complexity to cover all categories of trainees, even the equal marks (3) are allotted for each levels.

In 50 nos of questions, the levels are considered as follows.

Level -1	-	30%	(i.e.)	15 Questions
Level -2	-	50%	(i.e.)	25 Questions
Level -3	-	20%	(i.e.)	10 Questions
		100%		50 Questions

Before Preparing questions for question bank (or) question paper, for multiple choice objective test, test profiles must be prepared for module weightage and topic weightag and considering the future and practical relevance, along with testing compulsory question weightage for the total number of question. All types should be covered in the question paper.

Test Paper profiles	
Feature	
Module / Topic	8-10 modules weightage based on time and relevance
Time	90 minutes
Level of complexity	Level : 25% Level : 50% Level : 25%
Test item type	Short answer : (30%) Multiple choice: (50%) Matching items : (20%)
Illustration	50%

Mind map

Before taking question in a practical topic, **mind map** can be prepared for covering all content with level of complexity.

Mind map helps to prepare the questions in each level with flow of contents in the topic like tree branches.

Mind map is a diagram used to visually organise information. It is hierarchical and shows relationships among pieces of the whole topic. (Fig 2)

It is often created around a single concept, draw as an image in the center of a blank page to associated representation of ideas as images, words and parts etc.

A sample mind map is shown in Fig 3 for a drilling machine topic for making question.

Fig 2

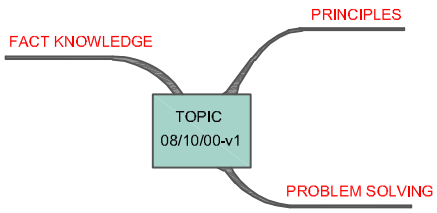
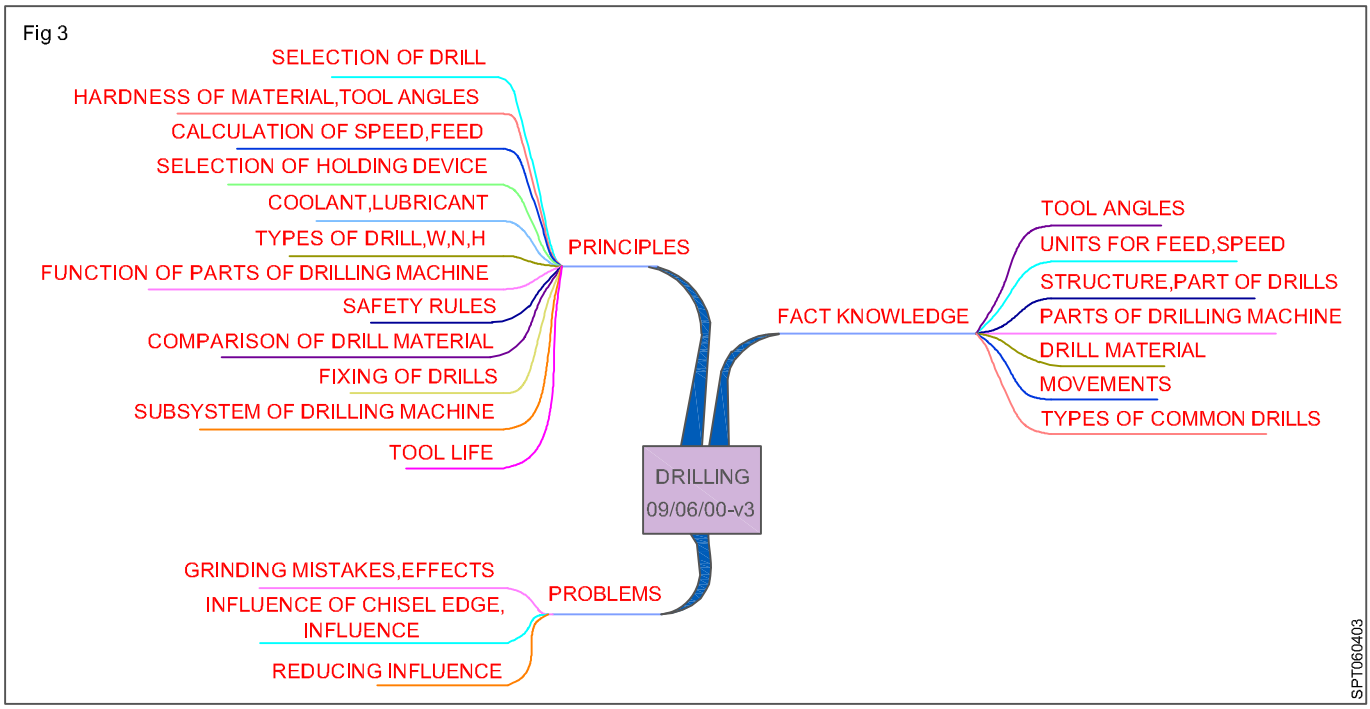


Fig 3



Model Questions

Theory 6.4

12 What is the advantages of objective type test?

A Chances of copying is less

B Easy for student to score high marks

C Quality of knowledge can be tested

D Useful for advanced students

13 Which type of objective test item is adapted in All India Trade test theory question paper?

A Short answer type

B Subjective type

C Matching type

D Multiple choice type

Principles of Teaching Test and Evaluation — Theory 6.5

Plan assessment activities and assess competence

Objectives: At the end of this lesson you shall be able to
- **define the assessment activities**
- **state the 3 types of learning assessment**
- **state the principle and purpose of assessment of learning**
- **state the implementation of formative and summative assessment**
- **state the assessment components and assess competence.**

Assessment activity

Assessment is defined as the action (or) an instance of making a judgement about something. (the act of assessing something).

The term "**Assessment**" refers to all those "Activities undertaken by the instructors/ teachers and their trainees/ students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged.

Types of learning assessment

There are three types of Learning assessment

- Assessment **for** learning (formative assessment)
- Assessment **of** learning (summative assessment)
- Assessment **as** learning (summative assessment)

Assessment for learning

It comprises-

- It creates self regulated learners, even left out they can able and have confident to continue learning throughout their lives.
- Assessment can be based on a variety of information sources such as work in progress, observation of teachers and conversations.
- Verbal (or) written feedback to the students initially descriptive and identifies challenges to next steps.
- Teachers can check on understanding and adjust their instruction to keep students on track.
- No grades (or) scores are given keeping records in descriptive.
- It occurs throughout the learning process from the outset of the course of study to the time of summative assessment.

Assessment of learning

- Assessment of learning is accompanied by a number or letter grade (summative)
- Compares one students/ trainees achievement with standards.
- Results can be communicated to the student/ trainee and parents.
- Occurs at the end of the learning unit.

Assessment as learning

- Assessment as learning begins as students / trainees become aware of the goals of instruction and the criteria for performance.
- Involves goal setting, monitoring progress and reflecting on results.
- Implies students/ trainees ownership and responsibility for moving his or her thinking forward.
- Occurs throughout the learning process.

Formative assessment

- Assessment made to determine a student's/ trainee's knowledge and skills, including learning gaps as they progress through a unit of study.
- Used to inform instruction and guide learning
- Occurs during the course of a unit of study
- Makes up the subsequent phase of assessment for learning.

Summative assessment

- Assessment that is made at the end of a unit of study to determine the level of understanding the student has achieved.
- Includes a mark or grade against an expected standard.

Principles of assessment for learning

This principle focus is on crucial aspects of assessment for learning, including the assessment as central to class room practice and that all teachers must regard assessment for learning as a key professional skill.

The big 5 principles of assessment for learning

- The provision of effective feedback to students/ trainees.
- The active involvement of students/ trainees in their own learning.
- Adjusting teaching to take account of the results of assessment.
- Recognition of the profound influence assessment has on the motivation and self - esteem of pupils, both of which are critical influences on learning.
- The need for students to be able to assess themselves and understand how to improve.

Purpose of assessment for learning

The purpose of AFL (Assessment For Learning) is to provide feedback to both teacher and learner regarding the learner's progress towards achieving the learning objectives.

This feedback should be used by the teacher to revise and develop further instruction.

Formative and summative assessment activities of learning is implemented in NSQF syllabus is illustrated.

Assessment as per NSQF

Body/ Bodies which will carry out assessment

National Council for Vocational Training (NCVT)

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptions. These five descriptions are:

- Process
- Professional knowledge
- Professional skill
- Core skill
- Responsibility

The NSQF level -5 descriptor is given below:

Level	Process required	Professional Knowledge	Professional Skill	Core skill	Resposibility
Level -5	Job that reqiures well developed skill, with clear choice of procedures in familiar context	Knowledge of facts, principles, processes and general concepts in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication	Responsibility for own work, learning and some responsibility for other's work and learning

Assessment guidelines

The trainer/ assessor should ensure appropriate arrangements for assessment and appropriate resources are available for undertaking such assessment. The nature of special needs should be taken into account while undertaking assessment.

The following marking pattern to be adopted while assessing:

- Weightage in the range of 60 -75% to be allotted during assessment under following performance level:

In this work there is evidence of:

- demonstration of good skill in the use of hand tools, machine tools and workshop equipment
- below 70% tolerance dimension/ accuracy achieved while undertaking different work with those demanded by the component/ job.
- a fairly good level of neatness and consistency in the finish
- occasional support in completing the project/ job.

Weightage in the range of above 75-90% to be allotted during assessment under following performance level:

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- 70 -80 % tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/ job
- a good level of neatness and consistency in the finish
- little support in completing the project/ job

Weightage in the range of above 90% to be allotted during assessment under following performance level:

In this work there is evidence of:

- high skill levels in the use of hand tools, machine tools and workshop equipment
- above 80% tolerance dimensions/ accuracy achieved while undertaking different work with those demanded by the component/job
- a high level of neatness and consistency in the finish.
- minimal or no support in completing the project.

Final assessments - All India trade test (summative assessment)

- There will be single objective type examination paper for the subjects Workshop Calculation and Science and Engineering Drawing.
- There will be a single objective type examination paper for the subject Trade Theory and Employability Skills.
- The two objective type examination papers as mentioned above will be conducted by National Council for Vocational Training (NCVT), whereas examination for the subject Trade Practical will be conducted by the State Government, NCVT shall supply the question for the subject Trade Practical.

Marking Pattern

Sl.No	Subject	Max subject marks	Max sessional marks	Minimum pass marks
1	Practical	300	100	240
2	Trade theory	100	20	48
3	Employability Skills	50	-	17
4	Workshop calculation & Science	50	10	24
5	Engineering Drawing	50	20	28
	Total	**550**	**150**	**-**
	Grand Total	**700**		

Format for Internal assessment

Name & Address of the Assessor :									Year of Enrollment :				
Name & Address of ITI (Govt./ Pvt) :									Date of Assessment :				
Name & Address of the Industry :									Assessment Location : Industry / ITI				
Trade Name:			Semester :						Duration of the Trade/ Course:				
Learning Outcome:													
Sl. No	Maximum Marks (Total 100 Marks)		15	5	10	5	10	10	5	10	15	15		
	Candidate Name	Father's/ Mother's Name	Safety consciousness	Workplace hygiene	Attendance/ Punctuality	Ability to follow Manuals/ Written instructions	Application of Knowledge	Skills to handle tools & equipment	Economical use of materials	Speed in doing work	Quality in workmanship	VIVA	Total Internal Assessment Marks	Results (Y/N)
1														
2														

Assessment Components

Components of an assessment during an assessment may be constructed with different components. Most assessment are largely similar and consist of the same components. An IQ (Intelligent Quotient) and personality test are almost will be the part of assessment, as well as practical simulations.

The most frequently used assessment components

- Aptitude tests.
- Personality tests
- Psychological assessment
- Role playing
- Two way interview
- Fact - finding
- Presentation
- Group discussion

Aptitude tests

Almost every type of assessment includes aptitude tests. This tests assess the capability or aptitude for a specific task in structured way. The different types of aptitude tests are available usually focus on correlations between words, numbers and or images.

Personality tests

Personality tests are normally conducted via a questionnaire by propositions are put forward to the candidate. These tests range between 30 and 300 question; depending on the type of assessment.

This type of testing is not based on correct or wrong answers. These tests may include control questions, that are asked several times, but phrased differently each time.

Psychological assessment

During the assessment, one or more psychologists will carry out a psychological test in combination with an interview. During the interview, the psychologist will ask you specific questions to create your profile. This profile may consists of the following sections:

- Work history / education
- Ambitions and plans for the future
- Strength and weakness analysis (SWOT_ analysis)
- Hobbies and leisure activities

Role playing

Role play is practical stimulation is used to assess how you handle specific situations. A number of situations are generally played out in order to provide a good picture of you. The roles offered to you may relate the position you are applying for or they may be linked to potential future positions.

Two way interview

The two way interview is the most common role play used during an assessment. During this interview you will be judged on your oral communication and assessed on whether you are result focused, motivated and purposeful in your work.

There are various types of two way interviews, the following are the most important:

- Manager
- Colleague
- Customer discussions
- Post & letter writing
- **Fact - finding:** It allows an assessment to be made of your method of working. How do you approach a problem? How did you go about finding the missing information? And most importantly what solution(s) can you offer?
- **Presentation :** The presentation role play is also sometimes called' the management case where you must give a successful presentation with limited information and a short preparation time.
- **Group discussion :** This type of role play is a well-known assignment positions. A problem is presented to the group which after a short preparation time yow will discuss with the group. In this type of role play, unlike in previous role plays, no clear division is made between roles. An important tip for these types of role play is to remain calm. Remain calm at all times using a self- assured tone. Try and ascertain the problem in order to maintain control of the situation.

Assess competence

Assess competence in the workplace is necessary to ensure that staff are both confident and competent in their work.

Individuals are considered competent when they are able to consistently apply their knowledge and skills to the standard of performance required in the work place.

Competency standards

Competency standards are a set of bench marks used to assess the skills and knowledge that a person must demonstrate in the workplace to be seen as competent.

This bench marks are packaged into combinations to form units of competency consists of unit codes.

Competency assessment term

This is valid and reliable tests that measure knowledge and skills required for a job competency that describe the knowledge and skills required to develop competency tests.

Competency based assessment is a process where an assessor works with a trainee to collect evidence of competency using the unit standards bench marks which comprise the national qualification.

It is not about passing (or) failing a candidate and evidence collection is more than just setting a test.

Model Questions

Theory 6.5

14 How many types of learning assessment activities are under taken by the teacher?

A 6

B 4

C 3

D 2

15 What does the assessment of learning comprise?

A Compare one student/trainees achievement with standards

B No grades or score cover are given keeping records in descriptive

C Involves goal setting, maintaining progress and training on result

D Occurs through out the learning process

Training on NSQF implementation manual

Objectives: At the end of this lesson you shall be able to
- **define the terms applicable to NSQF**
- **state the features of national skills qualification, its level descriptors and key elements**
- **explain, how NSQF in implemented in ITI/CTS and instruction for trainees**
- **describe the assessment guidelines in training process**
- **describe the ten levels of NSQF and their explanation.**

Few terms are used very frequently in this manual. They are clarified from NCVT point of view.

- **Competence** means the proven ability to use acquired knowledge, skills and personal and social abilities, in discharge of responsibility roles in a given environment/situation.
- **Learning Outcomes** represent what a learner knows, understands and is able to do on completion of a learning process, and which would be expressed in terms of knowledge, skills, and competence.
- **Assessment criteria** state what is to be assessed and the required level of performance of the activities. These are defined against each Learning Outcome.
- **"Credit"** is recognition that a learner has successfully completed a prior course of learning, corresponding to a qualification at a given level.
- **"Knowledge"** means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. Knowledge is described as theoretical and/or factual.
- **"Learner"** refers to an individual undergoing skill development training, whether in a formal or informal setting.
- **"National skills qualifications committe"** or **"NSQC"** refers to the committee set up in accordance para14. (i).
- **"Qualification"** means a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards.
- **"Recognition of prior learning"** or **"RPL"** is the process of recognising previous learning, often experiential, towards gaining a qualification.
- **"Sector"** means a grouping of professional activities on the basis of their main economic function, product, service or technology.
- **"Skills"** means the ability to apply knowledge and use know-how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, initiative and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments);
- **"Trainer"** means someone who trains, instructs, teaches or otherwise enables the learner(s) to acquire the appropriate knowledge and skills
- **"Training provider"**, **"Institute"** and **"Institution"** refer to any organisation providing knowledge and skills to learners.

Introduction of NSQF

Government of India has notified establishment of National Skill Qualification

The NSQF shall be anchored by the National Skill Development Agency (NSDA)and will be implemented through the National Skills Qualification Committee (NSQC).

NSQC shall approve qualifications and maintain Qualification Register.

What is the national skills qualification frame-work?

The National Skills Qualification Framework (NSQF) organizes qualifications according to a series of levels of knowledge, skills and core skills and responsibility.

The levels of a framework indicate different degrees of complexity of the learning outcomes.

The lowest level often define the basic generic or vocational skills for people who can work effectively under supervision.

The central levels typically define the expected requirements for professional who can act independently,.

The highest levels emphasize the capacity to analyses and innovate, create new knowledge and may include the ability to lead and manage people and processes.

Level descriptors

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors.

These five domains are:

a Process

b Professional knowledge

c Professional skill

d Core skill

e Responsibility

The key elements of the NSQF provide

- National principles for recognising skill proficiency and competencies at different levels leading to international equivalency.
- Multiple entry and exit between vocational education, skill training, general education, technical education and job markets.
- Progression pathways defines within skill qualification framework.
- Opportunities to promote lifelong learning and skill development.
- Partership with industry/employers
- A transparenet, accountable and credible mechanism for skill development across various sectors.
- Increased potential for recognition of prior learning.

The NSQF level descriptors along with explanation are detailed in the link http://www.NSQF implementation manual

NSQF Implementation in ITI/CTS

It has been decided to introduce NSQF in all courses under CTS. The details of NSQF aligned curricula are available at www.cstaricalcutta.gov.in/syllabi.axpx. The training activities will be outcome based. It is the responsibility of the concerned trainer, principal, State Directorate/ Management to ensure that students achieve the learning outcomes and demonstrate competency according to assessment criteria.

Assessment would be carried out according to minimum assessment criteria as prescribed. Assessment criteria shall evolve with learning, must be transparent and known to trainees in advance. Indicative role & responsibilities of the stake holders are given below:

A NCVT

1 Facilitate Horizontal and Vertical mobility by interacting with other regulatory institutions/ organizations.

2 Monitor & Coordinate with the State Govt. the implementation of courses

3 Ensure timely fair, valid, reliable assessment and certification.

4 Formulation and updating testing procedure on continuous basis.

5 Promote conducive & competitive environment in ITIs.

6 Notification to all stake holders and govt. agency, prospective employers about the implementation of NSQF alignment of NCVT courses for market acceptability.

B Role of the state

1 Creation of NSQF implementation cell in the state and intra-regional level for effective and timely implementation

2 Providing infrastructure (if already short) and man power support to go ahead with the scheme for effective implementation

3 Effective monitoring by suitable MIS mechanism

4 Organizing and supporting of training of trainers and officials through various programmes in coordination with DGT.

C Role of CFIs

1 All the Principals/Directors/HODs must ensure that their faculty is clear in concept and understanding of NSQF. They are equipped to support the implementation of NSQF if any state Directorate/ ITI approach them.

2 All the ITOT programs, which are starting from August 2018, will be run and evaluated in NSQF format.

3 Each CFI located in the particular region shall identify the entire requirement for initiating the implementation.

4 A nodal officer and a team of officials at every CFI will coordinate with the concerned State Directorate to provide all possible support to all the stake holders in the region.

5 CFI shall conduct awareness training programme to all stake holders like ITIs, industries, industry association, and State govt. officials through special training methodology including DLP.

6 CFIs in which studios and hubs are located viz. NSTI Chennai and Mumbai shall organize and coordinate with others hubs and spokes in support with CSTARI and NIMI for dissemination of all information connected with NSQF.

Instruction for trainers

The Principal of the concerned ITI shall act as the chief coordinator of the training programme and will ensure effective implementation of the course.

He/ She shall ensure that trainers/ faculty are able to deliver the learning objectives. The Trainer/ Instructor will impart knowledge of the Professional Knowledge, Professional Skill and Core Skill in their respective trades. The performance appraisal of Trainer/ Instructor shall be linked to delivery of quality output.

The Learning Outcomes of each trade are broadly categorized in two parts. They are Generic Learning Outcome and Specific Learning Outcome. The Generic Learning Outcomes are generic in nature covering components of Workshop Science & Calculation, Engineering Drawing & Employability Skill and are not trade specific whereas Specific Learning Outcomes are trade specific.

The lesson plan/ demonstration plan may be drawn with respect to the each Learning Outcome. The training on skill and knowledge components must be planned and imparted in such way that the trainees are able to execute each Learning outcome as per defined Assessment Criteria.

The delivery of the training shall be planned in such a way that at the end of the training all the trainees are in a position to demonstrate competencies as per assessment criteria defined. The assessment of trainees shall be continuous process and on completion of each learning outcomes necessary records / evidence to be preserved by the concern instructor.

Internal assessment of the performance of students will be done by the instructor of concern ITI in a continuous comprehensive manner. The NCVT will conduct external competency based assessment/examination of skills & knowledge of the trainees.

The examination will be conducted by NCVT to test basic skills on Workshop Science & Calculation, Engineering Drawing and Employability Skills as per NCVT guidelines apart from Professional Skill and Professional Knowledge. However, their applications will also be assessed during execution of specific learning outcome.

Conducting training

In order to achieve defined learning outcome by the trainee, the trainers may adopt following flow chart: Refer page No. 5.

Note: As indicated by arrow lesson plans would be developed from top to bottom but training will be conducted from bottom to top.

Types of assessment to be adopted

A Formative Assessment

B Summative Assessment

A Formative Assessment

The Trainer shall prepare a report for every assessment observation and a copy of this will be placed as evidence in the candidate's portfolio. The types of evidence such as:

- Assessor's Observation reports
- Job piece/ output of the Practical exercise/ Assignments/Project Reports along with their appropriate Evaluation documents/Check list.
- Theory written test.
- Result of written or oral Questioning/Viva-voce, conducting interviews and questionnaires.
- Direct Performance Observation
  - At the work place/Laboratory/Workshop
  - Simulated Work Environment
- Participation in Group activity/competition
- Trainee Portfolio maintained by trainee (to include collection of work samples, written documents, Photograph/video of trainee doing actual work in the institute.)

Evidence of internal assessment to be preserved until forthcoming examination for audit and verification by examination body.

B Summative Assessment

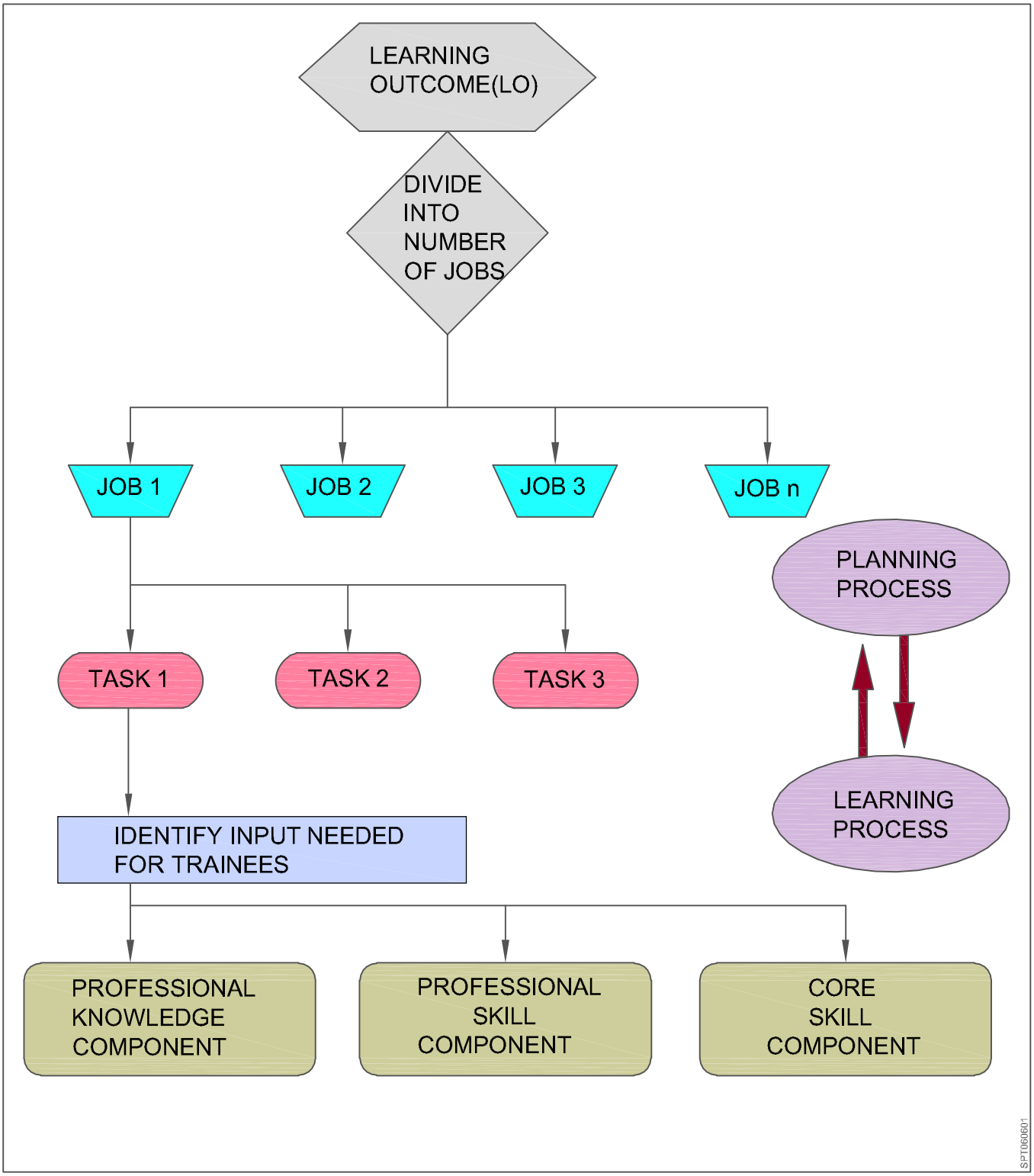
The Summative Assessment is to be carried out for Theory & Practical as prescribed by NCVT. The Trainee will be eligible for summative assessment after completion of all the formative Assessments, in addition to requirement of 80% attendance.

Assessment Guidelines

Principles assessment

Assessment is central to the recognition of achievement and the quality of the assessment is therefore important to provide credible certification credibility in assessment is is assured through assessment procedures and practices being governed by certain principles

Analysis of Training process



The AITT examination is to take place as per notification issued from NCVT time to time. The each examination encompasses such skills as are listed for that period of training and also includes theoretical knowledge, Core skills & Employability Skills. The Employability Skills will be covered in first year only.

Theory tests

Much of theoretical knowledge will be tested in its application in practical. However, the theory test is considered necessary to assess the knowledge, which is essential for a person to do the job. The examination pattern and marks will be as NCVT guidelines issued from time to time.

Practical tests

- Trainees will carry out the assigned exercises as per question papers supplied by NCVT.
- The External Examiner/assessor will verify the *trainee portfolio* of every Trainee and the Marks Awarded against them.
- Evaluation of the practical test will be carried out by the External Examiner/assessor according to the Marking Instructions/guidelines issued by NCVT.
- Evidence of external assessment would also be preserved by Institute/State Director, which can be verified by NCVT representative.

Broadly candidates are to demonstrate that they are able to

1 Read & interpret technical parameters/documentation, plan and organize work processes, identify necessary materials and tools;

2 Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;

3 Apply professional knowledge, core skills & employability skills while performing the task.

4 Check the job as per drawing/assembly for functioning, identify and rectify errors in job/assembly.

5 Document the technical parameters related to the task undertaken.

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50 % weightage is applied to each examination for two years courses. The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%.

The following marking pattern to be adopted while assessing

a Weightage in the range of 60-75% to be allotted during assessment under following performance level

For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.

In this work there is evidence of

- demonstration of good skill in the use of hand tools, machine tools and workshop equipment
- below 70% tolerance dimension / accepted limit achieved while undertaking different work with those demanded by the component/job.
- a fairly good level of neatness and consistency in the finish
- occasional support in completing the project/job.

b Weightage in the range of above 75% - 90% to be allotted during assessment under following performance level

For this grade, the candidate, with little guidance and showing due regard for safety

procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.

In this work there is evidence of

- good skill levels in the use of hand tools, machine tools and workshop equipment
- 70-80% tolerance dimension / accepted limit achieved while undertaking different work with those demanded by the component/job.
- a good level of neatness and consistency in the finish
- little support in completing the project/job

c Weightage in the range of above 90% to be allotted during assessment under following performance level

For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.

In this work there is evidence of

- high skill levels in the use of hand tools, machine tools and workshop equipment
- above 80% tolerance dimension/ accepted limit achieved while undertaking different work with those demanded by the component/job.
- a high level of neatness and consistency in the finish.
- minimal or no support in completing the project

Recording the Assessment: All the relevant evidence to be preserved till the examination is over and marks allotted to each trainee against the Learning Outcomes are to be recorded.

Refer module 3.1 for the NSQF Levels with descriptors.

Theory 6.1

I Multiple Choice Question items

Choose the correct answer:

1 Which is the lowest level of cognitive domain of Bloom's Taxonomy old version?

A Analysis

B Evaluation

C Synthesis

D Knowledge

2 Which is the highest level of cognitive domain of Bloom's Taxonomy new version?

A Create

B Remembering

C Analysis

D Understand

3 How many levels in the affective domain of Bloom's Taxonomy?

A 4 levels

B 5 levels

C 6 levels

D 7 levels

4 What changes in terminology in revised Bloom's Taxonomy at cognitive domain?

A "Knowledge" was renamed as "Remembering"

B "Comprehension" was changed as "Applying"

C "Synthesis" was changed as "Understanding"

D "Application" was renamed as "Analysing"

Theory 6.2

5 Which test item is the selection type?

A Multiple choice

B Short answer

C Essay type

D Direct question type

6 Which action verb belongs to level-2 complexity question?

A Formula

B Purpose

C Specification

D Values

7 Which test is the objective type test?

A Performance skill test

B Essay type

C Matching type

D Oral test

8 Which question is the example of level-1 complexity?

A What is the function of choke in tube light?

B What is the use of try square?

C What is the S.I. unit of work done?

D Why the fan is running slowly?

Theory 6.6

16 How many learning out come domains (level descriptors) are described in NSQF?

A 3

B 4

C 5

D 6

17 Which is 4th domain of learning outcome in NSQF?

A Responsibility

B Core skill

C Professional skill

D Professional knowledge

18 What is the full form of NSQC?

A National Skills Qualification Council

B National Skills Qualification Committe

C National Skills Qualification Consultant

D National Skills Qualification Control

UNIT - VII

ORGANIZATION AND MANAGEMENT OF INSTRUCTIONAL FUNCTIONS

Learning Outcomes to be achieved from this unit:

- **Manage the training facilities and follow the concept of 5S in housekeeping**

Principles of Teaching Theory 7.1
Organization and Management of Instructional Functions

Teaching and managerial responsibilities of classroom and its management

Objectives: At the end of this lesson you shall be able to
- **define the terms teaching and training**
- **list out the responsibilities of a teacher/trainers**
- **state the features of a planning**
- **define management**
- **list out the points on class room management**
- **brief the key elements management of class room**
- **list out the characteristics of organised workshop**
- **explain the steps involved in workshop layout.**

Teaching and training is a complex activity involving knowledge, skill and techniques of instruction of a higher order. Teaching has its specialised techniques that are not characteristic of other professions.

The teacher/trainers has the responsibilities of planning organising and preparation for teaching, assigning lessons, directing study activities, demonstrating skills, guiding skill practice, conducting group discussions, reviews and progressive tests and discussions, and providing diagnostic and remedial work. Throughout his activities the teacher has to plane, prepare, explain, question and direct.

Planning

Planning is one of the important attributes of educational/ training management. To achieve the aims and objectives of education; effective planning with organising, staffing directing and controlling are required.

Features of a plan

- Planning is a process rather than behavior at a given point of time. The process determines the future course of action.
- Planning is primarily concerned with looking into future, which requires forecasting of the future situation.
- Planning involves selection of suitable course of action.
- Planning is undertaken at all levels of management and is concerned with the future course of action.
- Planning is flexible as commitment, is based on future conditions which are always dynamic.
- Planning is a continuous managerial function involving the process of perception, analysis, conceptual thought, communication, decision and action.

A good plan should aim at the improvement of physical facilities, teachers, library services, curricular, co-curricular activities, participation in community programmes and the like.

Organisation is a means to bring the plan into existence. Organisation is directly connected with planning and efforts of the people. It is a medium, through which goals and the objectives enlisted by the administration are achieved.

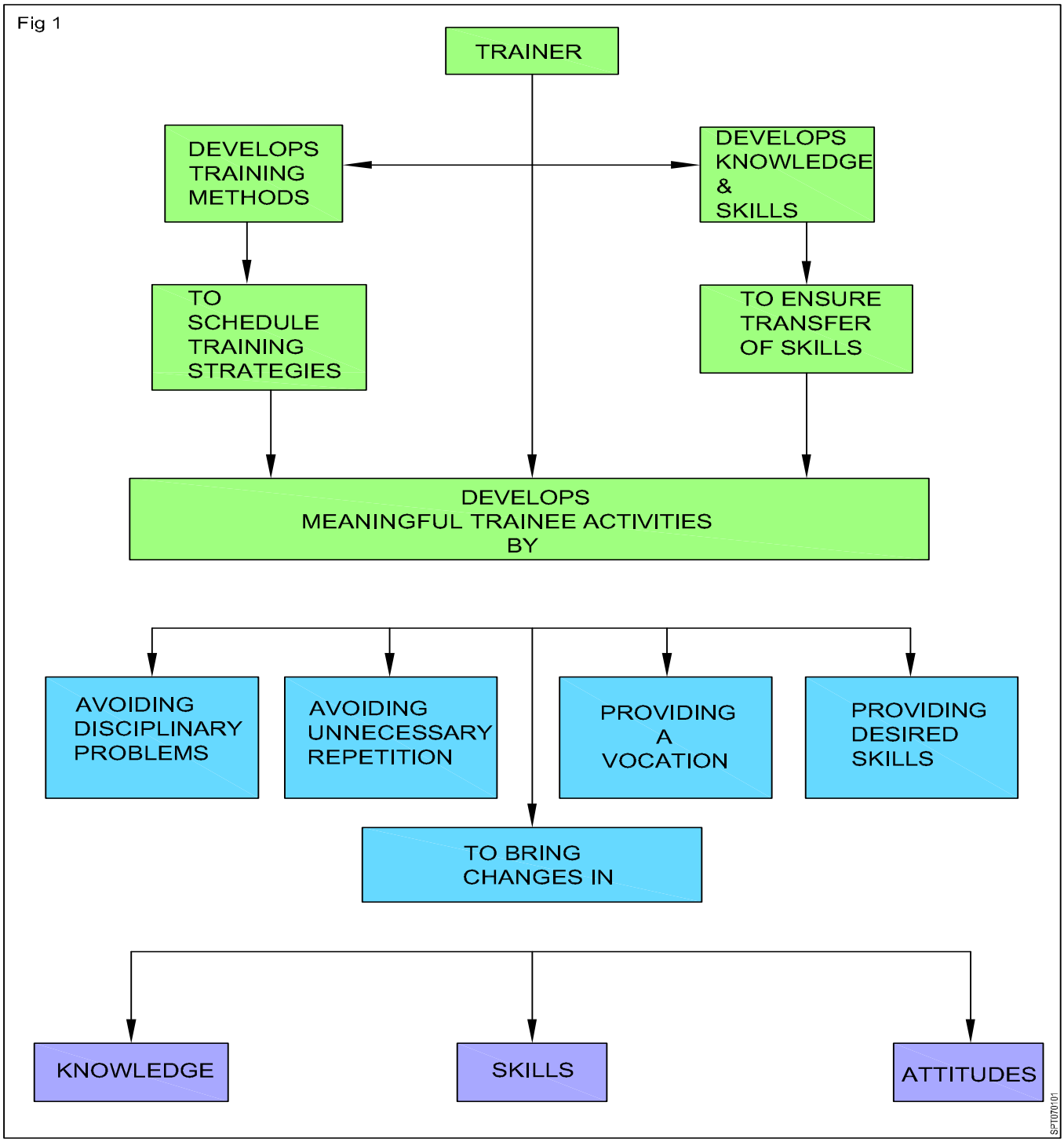
The points to be considered for preparing a good plan for organising classroom processes.

- The purpose of the plan must be determined. The objectives to be achieved must be clearly identified.
- Planning, organisation and management of classroom activities must be formulated on clearly defined vision and mission.
- Plans for catering to the varied needs and interests of students must be organized.
- Standards to be achieved by the planning, organizing and management must be set and performance monitored.
- Plans must be flexible to allow for modification/ innovation in light of experiences.
- Full communication of all concerned in operating the plan.
- Plans must be achievable.

The organising role expects teachers to make arrangement and develop an orderly structure to combine all elements in classroom processes into a unified whole. Well organising is closely associated with systematic planning. Further, planning is concerned with identification of appropriate activities, organising is concerned with making arrangements and structuring the classroom to implement classroom activities. The role of teacher as an organiser is to link planning with all other roles of communicating, motivating and controlling.

Management is an art and a science; it is an art as it involves application of skills and it is a science as it is a body of systematic body of knowledge developed through experimentation and observation.

Fig 1



Classroom management is a process of leading the school towards development through not only the optimum use of the human resources, physical sources, principles and concepts that help in achieving all the objectives and also the proper coordination and adjustment among all of them.

Thus, classroom management

- Is a process
- Is a social process
- Involves group effort
- Aims at achieving pre-determined goals
- Is a distinct entity
- Is system of authority
- Is required at all levels of orgnisation.

The classroom management undoubtedly depends upon the teachers managerial skills. The teachers are to be trained in various aspects related to classroom management like

- organising meaningful learning process,
- creating a platform for the students to come out with their potentialities,
- knowing the students,

- motivating the students,
- appraising every student's accomplishments,
- creating a stimulus environment congenial for learning and the like.

Therefore, it is very necessary, the student teachers being trained in these skills so that they can become effective classroom managers.

Management gains importance in the light of achieving the objectives and planning for the same. It involves varied activities and co-ordination among all the stake holders.

Management is that function of an organisation concerned with the co-ordination and cooperation necessary for attaining the goal with reference to classroom processes.

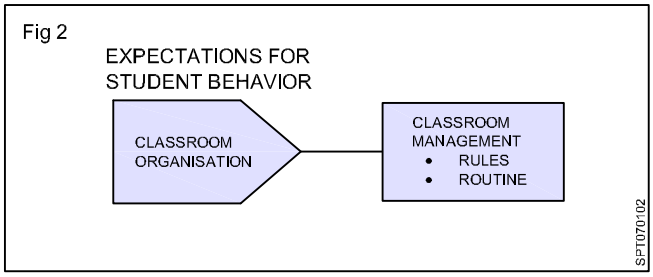
Classroom management entails three basic functions viz.,

Planning, by which objectives, procedures are selected.

Control, by which the conformity of performance to plans is assured.

Communication, by which information is transferred both internally and externally.

Fig 2



Objectives of class room management

- To determine the objectives of the processes involved in the school organisation and the management.
- To formulate a system of co-ordinated activities for classroom processes.
- To determine the quality index for the processes involved in the school.

Time management

"Well arranged time is the surest mark of a well-arranged." - Pitmen. The success of a classroom processes depends on the inputs that are given to the students in a period of time, in a pre-set environment. The time management is one of the important aspects of classroom management. The program of work and time table provides a path for the time management and smooth going of the classroom processes. It is the time table that supplies the frame work of the processes.

Significance of the time-table

- It provides / brings system in the school / classroom processes.
- Facilitates regular and even programs.
- Eliminates wastage of time and energy.
- Ensure equitable distribution of time to different subjects and activities.
- Ensures efficiency.
- Leads of even and regular school / classrooms processes.
- Facilitates advance planning by the teacher and students.
- Creates a psychological environment.
- Helps to maintain discipline.

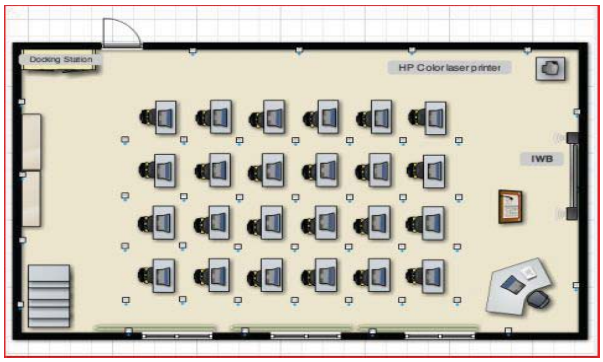
Apart from the above the following are also some of the suggestions in effective planning, organisation and management of classroom process.

- Emphasis on qualitative improvement.
- Emphasis on practical aspects of educational planning and organsation with reference to curriculum planning, planning co-curricular areas, personality development, evaluation and the related aspects.
- Organizations of activities related to quality improvement are focused on clusters and the blocks. There is a need for both the planners and the participants at the cluster/block level to understand the components of planning and organisation.
- Monitoring and supervision of the educational activities.

The size and layout design of the class room will vary depending upon the number of students and the designer.

Example of class room layout is shown in Fig 3.

Fig 3



Managerial Responsibility in Instructional area Fig 4

Training workshop as the name itself indicates that it is a place where practical training is imparted. When we say practical it is obvious that the training imparted is more skill based. So when we obtain machinery and equipments for a particular trade, it is the responsibility for a concerned instructor to arrange it in an orderly manner. Therefore trainer should adopt the principle of a good housekeeping.

Before actually placing the machines in a workshop, an instructor has to prepare a rough layout of a workshop indicating proper places for the machines. When the actual arrangement is been done it should be seen that there is sufficient space in-between the machines so that there is no overcrowding. There must be sufficient free space for operating the machine and also for operators. Care should be taken to see that part of the machines should not cause inconvenience for men and material.

Maintenance of floor also is an important factor without which accident may occur. It should also be seen that proper facilities are there for storage of materials. If materials are kept all over the workshop it will be inconvenience for proper working. Apart from these factors an instructor while designing workshop should take care to see that other facilities like proper ventilation, light, use of proper colors, availability of first aid boxes, and fire extinguishers, cleanliness, etc. are made available at workshop.

Hence good housekeeping is an important factor while designing a workshop.

Fig 4

Managerial Responsibilities

Workshop Layout and Organization

Workshop layout is a process of carefully distributing the available floor, one word space for each activity or component of a workshop.

Characteristics of well - organized Workshop

- Favorable atmosphere
- Safety
- Convenience
- Tools, equipments and machinery
- Organisation of available space
- Lighting and ventilation

Following are the steps to be followed to prepare a workshop Layout.

- Actual available floor space of workshop to be measured and scale drawing must be prepared.
- Exact location of windows, doors, pillars, and columns must be shown clearly.
- List of all machinery equipment furniture required in the workshop must be prepared.
- Sequence of the items as per the importance must be prepared. After sequencing floor space. For other facilities like storage drinking water must be provided.
- Sufficient open space in and around the heavy machinery must be provide.
- After completing the above steps care must be taken to see that floor space needed for each item has been properly estimated and represented floor space area occupied by each individuals requirement is on and the same scale.
- Provision must be made for future expansion of the workshop.

By following the above steps, one can prepare a good workshop layout.

Workshop Management (Fig 5)

A well-equipped workshop is essential for imparting training. Everything in the workshop must be properly arranged in such a way that they are available easily, but it is not sufficient if things are arranged at once and later on ignore it. Hence to become successful instructor mere planning a workshop is not sufficient. But maintaining it with good management is import and important.

Fig 5

Tool Board

Factors that an instructor should keep in mind for efficient management of training activity are as follows

- Cleanliness: Floors must be free from oil, grease, water and other slippery things. Before leaving the workshop premise the evening care should be taken to check if everything is in order for the next day. Individuals must keep their work area clean and tidy.
- Tools and Equipments: Tools and Equipments must be cleaned and kept in their respective places.
- Scrap and waste materials: Scrap and waste materials should be collected and disposed immediately.
- An Instructor: An Instructor should be the best example by keeping the workshop neat and tidy.

Advantages of workshop Layout (Fig 6)

Fig 6

Shop Floor

- Floor space can be used economically.
- Possible convince and inconvenience problems can be seen before and solve.

Care and Maintenance of Materials

Tools and equipments must be cleaned and checked regularly. Stock registers are also necessary. There should be proper arrangement for storage of tools and equipments. Everything must be replaced in their own and respective place after use. Generally tools will be displayed in a board called tool-board.

Maintenance and Repair of Tools and Equipments: Maintenance of equipments are classified into two types.

Before Going Out of Order

This is known as Preventive Maintenance of equipment. The equipments must be checked regularly. By doing this, some minor defects caused during practical can be rectified immediately without any delay. A maintenance schedule must be made and instructor should see that it is being followed properly.

After Going Out of Order

This is known as Corrective Maintenance. When equipment goes out-of-order, it is a foremost duty of an instructor to report it to the concerned authorities. Experts from the related field should be called and get rectified. Remedial action taken to rectify the same should be recorded in the history sheet provided along with the machine. This will also serve as a source of reference for future.

Tool Crib

A designated area in a workshop where extra tools and accessories are kept. The tool crib is also typically where tools can be serviced or repaired.

Model Questions

Theory 7.1

1 What is the name of the term that is flexible as commitment and is based on future conditions which are always dynamic?

A Planning

B Management

C Workshop layout

D Organised workshop

2 What is the name that is facilitates regular and even programs

A Planning

B Management

C Significance of time table

D Organisation

3 Which one of the followings is class room management?

A Helps to maintain discipline

B Distinct quality

C Ensures efficiency

D Favourable atmosphere

4 Which one of the followings is the characteristics of well-organised work shop?

A Facilities regular and even programs

B Is required all levels of organisation

C Creates a psychological environment

D Lighting and ventilation

Concept of 5S and its application, housekeeping and safety

Objectives: At the end of this lesson you shall be able to
- **explain 5s concept and its application**
- **define workshop safety**
- **define housekeeping and explain its importance.**

5S for workplace organization

5S is a systematic approach to workplace organization. This 5S concept quality parameters of workplace organization methodology uses a list of five Japanese words which are;

Seiri, Seiton, Seiso, Seiketsu, and **Shitsuke**.

Translated in English, they all start with the letter **'S'**.

The list describes how items are;

Sorted, Stabilized, Systematically cleaned, Standardized, and **Sustained.**

5S is the brainchild of Hiroyuki Hirano of Japan, is widely considered as being the basis for Lean Manufacturing as it is concerned with stability and standardization to bring about improved safety, quality, delivery performance and cost control.

Lean Manufacturing is a methodology derived from the Toyota Production System (TPS) which originated in post World War II.

The fundamental principle of TPS is to increase productivity and generate product flow through the value stream by a disciplined and focused effort on eliminating waste.

The foundation for TPS is stability, i.e. minimal process variation, this being achieved by standardization of work practices.

The 5S Quality Parameters are

1 Sort (Seiri) -

sort out what is needed and get rid of what isn't

2 Set (Seiton) -

a place for everything and everything in its place

3 Shine (Seiso) -

clean and maintain so always looks like new

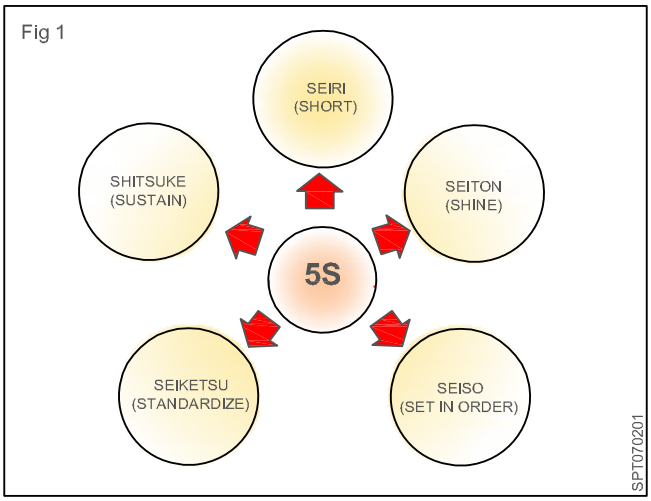
4 Standardise (Seiketsu) -

make it the standard and follow discipline

5 Sustain (Shitsuke) -

Audit the system and improve it

Fig 1



Workshop Safety and Causes of Accidents

Trainees are required to work on machines, which are power-driven and runs at a high speed. While working on such a machine there is a possibility of accidents.

There are various causes for accident like ignorance, carelessness, fatigue, improper clothing, etc. So an instructor must take all steps possible to see that accident do not occur. If trainees are made to work in an atmosphere, which is unsafe, their performance will not be good and they always have the fear of accident.

Hence safety is a very important factor in a training workshop.

Common causes of accident in an industrial workshop are generally presumed as:

- Human causes;
- Machinery Causes; and
- Other types of causes.

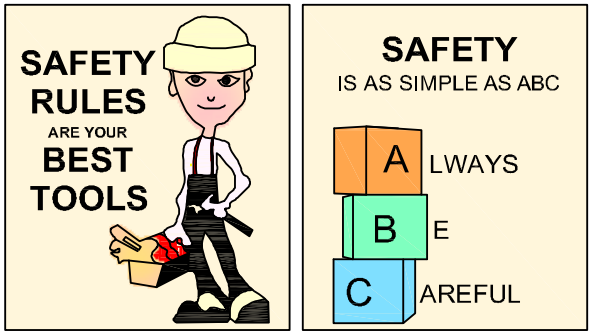
Safety is an important factor which has to be given importance while preparing workshop layout. Accidents can be avoided by

- Providing sufficient knowledge of the workshop safety the training.

- By creating an atmosphere where people work and feel safe.

Along with the heavy machinery a poster containing important safety precautions can be displayed. Fire extinguisher, first aid box must be kept in a proper place.

Fig 2



Safety Slogans:

Whether you are at work, or at home or at play, safety should always be in the front of our minds. Following are few safety slogans which you can remember:

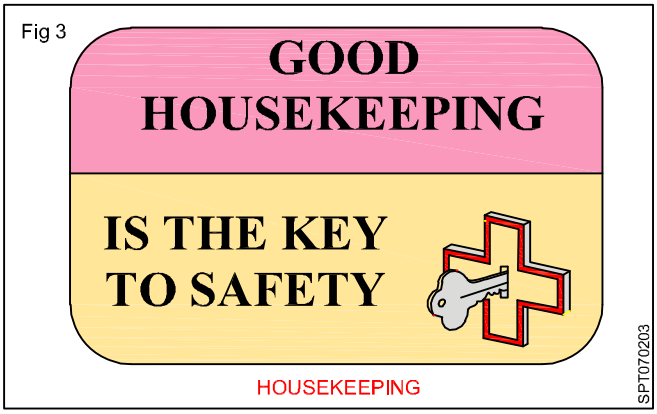
- "A casual attitude towards safety = CASUALTY"
- "Accidents hurt - Safety doesn't."
- "A wound neglected is a wound infected"
- "Do your work with pride, put safety in every stride."
- "Don't be a fool, use the proper tool."
- "Safety starts with 'S' but begin with 'U'!

Housekeeping

Importance of Good Housekeeping

People can live in any kind of environment but for a decent environment it is important to follow a habit of 'good housekeeping'. In the same way training can be imparted under any conditions. But when the training is imparted in an environment, which creates better students, then teaching will be effective. Hence it is the responsibility of an instructor imparting training to create a positive atmosphere for learning. This is possible only when the trainer adopts the principle of good housekeeping. Good housekeeping is creating a favorite environment and providing sufficient facilities for positive and active learning. Someone in a house arranges the furniture and other items of a house properly and accessed easily when they are required, then we can say the person has very good knowledge of housekeeping. So good housekeeping means proper placement of everything in proper way.

Fig 3



Elements of Good Housekeeping

Cleanliness:

The first and foremost thing of housekeeping, which has to be taken care is cleanliness. If the place of work or the place where the training is imported is untidy trainees will not have interest to undergo training in such environment.

Maintenance of Floor:

Floor must be maintained properly. It must be free from oil, grease, water and other slippery things. Floor level must be uniform so that it will not be difficult for fixing machines and also for the movement of men and material.

Placing of Machines:

Machinery items must be placed properly. In running condition, the machines should not cause any sort of damage to the person moving around the machine. Care should be taken to see that heavy equipment has proper foundation. Overcrowding in one place to be avoided.

Gangways:

For the movement of men and material proper gangways and storage space should be provided. It should have minimum width as required and should be marked with suitable color (ex. Yellow or white printed lines for walking).

Storage of Materials:

After obtaining the training materials from the stores the instructor has to store in a proper place. Explosives and Inflammable items should be kept at a distance in order to avoid accidents. Storage must be in such a manner that the material could be available for use at a right time.

Scrap and Waste Materials:

It must be collected before disposing it. For metal scraps, enquires must be made to find out if they can be purchased by some agents, which may be useful for them. Waste items must be disposed-off in a proper manner.

Lighting and Ventilation:

Without proper ventilation and lighting it will not be possible for doing any kind of work at the workshop. Lighting can be made available by using tube lights but care should be taken to see that brightness is not too much and it should not be too dull. Natural lighting is always preferred. Proper lighting avoids accidents and enhances the speed of work. Ventilation must be provided by the use of fans and natural ventilators.

Colour Dynamics:

Colour plays important role in workshops. Proper use of colours in work place, equipments are important. Light colours give or create pleasant atmosphere. Ceiling must be in white, walls must be with light colours, machinery equipments normally in olive green. By looking at the colours we can make out what it exactly means. For example: When the red bulb glows it means 'stop' and when the yellow bulb glows it means 'be ready or alert' and when the green bulb glows it means 'proceed or go'.

Fire Extinguishers and First Aid:

As per the Factory's act every institution is required to have fire extinguishers. Students must be trained to use them if fire break out. Carbon dioxide is normally used as a fire extinguisher agent. Some other agents used are Carbon tetra chloride, soda acid foam and sand.

Even after taking all kinds of preventive measures there is a possibility of an accident in case of which all the sections must be able to help themselves without waiting for a doctor. There must be a first aid box, which contains all essential materials by which an injured person can be treated immediately.

Teacher must also train the students how to use it when it is needed. It is absolutely necessary to locate the box in a place where pupil can have easy access. Finally it can be said that a training workshop should be designed keeping in view all the above aspects will be an ideal place for imparting training.

Fig 4 FIRE SAFETY EQUIPMENT

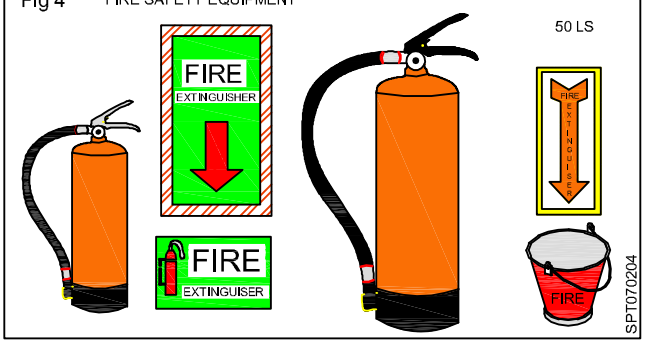
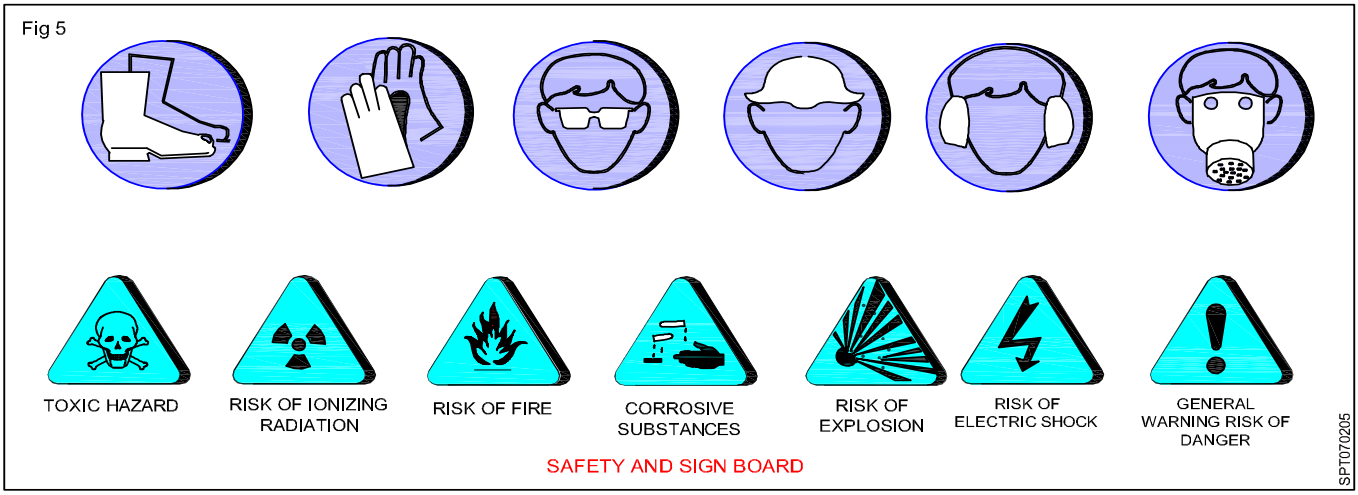


Fig 5



SAFETY AND SIGN BOARD

Model Questions

Theory 7.2

5 Why 5S is provided?

A It is 5 safety slogans

B It is for class room management

C It is for workplace organisation

D It is for first aid

6 In the 5S quality parameters of the japanese word seiri refers what in the english language?

A Shine B Set

C Sort D Sustain

7 What is the equivalent in japanese word for shine?

A Shitsuke B Seiketsu

C Seiso D Section

8 Which one of the following is the elements of good house keeping

A Colour dynamics B Shine

C Sustain D Sort

9 What is the equivalent english work for seiketsu?

A Sustain B Shine

C Sort D Standardise

Leadership traits, functions and styles

Objectives: At the end of this lesson you shall be able to
- **define the term leadership**
- **list the duties of the leader**
- **explain the various types of leadership style**
- **list the characteristics leadership**
- **list the traits of an effective leader.**

The word “leadership” can bring to mind a variety of images. For example:

- A political leader, pursuing a passionate, personal cause.
- An explorer, cutting a path through the jungle for the rest of his group to follow.
- An executive, developing company’s strategy to beat the competition.

Leadership

Leadership is the ability of an individual or a group of individuals to influence and guide the followers or other members of an organization.

An effective leader is a person who does the following

Creates an inspiring vision of the future.

Motivates and inspires people to engage with that vision.

Manages delivery of the vision.

Coaches and builds a team, so that it is more effective at achieving the vision.

Creating an inspiring vision of the future

Vision provides direction and sets priorities.

To create a vision, leaders focus on an organization’s strengths by using tools such as porter’s five forces, PEST analysis, USP analysis, core competence analysis and SWOT analysis to analyze their current situation. They think about how their industry is likely to evolve, and how their competitors are likely to behave. They look at how they can innovate successfully and shape their business and their strategies to succeed in future market places. And they test their visions with appropriate market research, and by assessing key risks using techniques such as scenario analysis.

Analysis : Therefore, leadership is proactive - problem solving, looking ahead, and not being satisfied with things as they are.

Motivating and inspiring people

Leaders ability to motivate and inspire people that helps them to deliver that vision.

For example, when you start a new project, you will probably have lots of enthusiasm for it, so it’s often easy to win support for it at the beginning. However, it can be difficult to find ways to keep your vision inspiring after the initial enthusiasm fades, especially if the team or organisation needs to make significant changes in the way that it does things. Leaders recognise this, and they work hard throughout the project to connect their vision with people’s individual needs, goals and aspirations.

One of the key ways they do this is through Expectancy Theory. Effective leaders link together two different expectations:

- The expectation that hard work leads to good results.
- The expectation that good results lead to attractive rewards or incentives.

This motivates people to work hard to achieve success, because they expect to enjoy rewards - both intrinsic and extrinsic - as a result.

Leaders can also motivate and influence people through their natural charisma and appeal, and through other sources of power, such as the power to pay bonuses or assign tasks to people. However, good leaders don’t rely too much on these types of power to motivate and inspire others.

Managing delivery of the vision

Leaders must ensure that the work needed to deliver the vision is properly managed - either by themselves, or by a dedicated manager or team of managers to whom the leader delegates this responsibility - and they need to ensure that their vision is delivered successfully.

To do this, team members need performance goals that are linked to teams overall vision. Leader also need to make sure the vision are implemented smoothly and thoroughly, with the support and backing of the people affected.

Coaching and building a team to achieve the vision

To develop a team, leaders must first understand team dynamics. Several well-established and popular models describe this, such as Belbin's team roles approach, and bruce Tuckman's Forming, Storming, Norming, and Performing theory.

A leader will then ensure that team members have the necessary skills and abilities to do their job and achieve the vision. They do this by giving and receiving feedback regularly, and by training and coaching people to improve individual and team performance.

Leadership skills

- Communication : One of the most important skills of a leader is the ability to communicate effectively...
- Awareness : A strong leader should also have an eye on the business process to learn which ideas are effective and which less so...
- Honesty and integrity...
- Inspire others...
- Commitment and passion...
- Good communicator....
- Decision-Making capabilities...
- Accountability...
- Delegation and empowerment.
- Creativity and innovation.

Types of leadership style

Positive and negative leaders or bosses. There are different ways in which leaders approach people to motivate them. They are..

- Autocratic or authoritarian leadership.
- Paternalistic leadership.
- Democratic or participative leadership.
- The laissez-faire or free-rein leadership.

Autocratic leadership or authoritarian leadership

The authoritative leadership style keeps main emphasis on the distinction of the authoritarian leader and their followers. These types of leaders make sure to only create a distinct professional relationship. Direct supervision is what they believe to be key in maintaining a successful environment and follower ship. Authoritarian leadership styles often follow the vision of those that are in control, and may not necessarily be compatible with those that are being led. Authoritarian leaders have a focus on efficiency, as other styles, such as a democratic style, may be seen as a hindrance on progress.

Examples of authoritarian leadership : A police officer directing traffic, a teacher ordering a student to do his or her assignment, and a supervisor instructing a subordinate to clean a workstation. All of these positions require a distinct set of characteristics that give the leader the position to get things in order or get a point across.

Authoritarian traits: sets goals individually, engages primarily in one-way and downward communication, controls discussion with followers, and dominate interaction.

Paternalistic

The way a paternalistic leader works is by acting as a parental figure by taking care of their subordinates as a parent would. In this style of leadership the leader supplies complete concern for his followers or workers. In return he receives the complete trust and loyalty of his people. Workers under this style of leader are expected to become totally committed to what the leader believes and will not strive off and work independently. The relationship between these co-workers and leader are extremely solid.

The workers are expected to stay with a company for a longer period of time because of the loyalty and trust. Not only do they treat each other like family inside the work force, but outside too. These workers are able to go to each other with any problems they have regarding something because they believe in what they say is going to truly help them.

Democratic leadership

The democratic leadership style consists of the leader sharing the decision-making abilities with group members by promoting the interests of the group members and by practicing social equality.

The boundaries of democratic participation tend to be circumscribed by the organisation or the group needs and the instrumental value of people's attributes (skills, attitudes, etc). The democratic style encompasses the notion that everyone, by virtue of their human status, should play a part in the group's decisions. However, the democratic style of leadership still requires guidance and control by a specific leader. The democratic style demands the leader to make decisions on who should be called upon within the group and who is given the right to participate in, make and vote on decisions.

Research has found that this leadership style is one of the most effective and creates higher productivity, better contributions from group members and increased group morale. Democratic leadership can lead to better ideas and more creative solutions to problems because group members are encouraged to share their thoughts and ideas. While democratic leadership is one of the most effective leadership styles, it does have some potential downsides. In situations where roles are unclear or time is of the essence, democratic leadership can lead to communication failures and uncompleted projects.

Democratic leadership works best in situations where group members are skilled and eager to share their knowledge. It is also important to have plenty of time to allow people to contribute , develop a plan and then vote on the best course of action.

Laissez-faire leadership

The laissez-faire leadership style is where all the rights and power to make decisions is fully given to the worker. The is was first described by Lewin, Lippitt, and White in 1939, along with the autocratic leadership and the democratic leadership styles.

Laissez-faire leaders allow followers to have complete freedom to make decisions concerning the completion of their work. It allows followers a self-rule, while at the same time offering guidance and support when requested. The laissez-faire leader using guided freedom provides the followers with all materials necessary to accomplish their goals, but does not directly participate in decision making unless the followers request their assistance.

This is an effective styles to use when:

- Followers are highly skilled, experienced, and educated.
- Followers have pride in their work and the drive to do it successfully on their own.
- Outside experts, such as staff specialists or consultants are being used.
- Followers are trustworthy and experienced.

This style should not be used when:

- The leader cannot or will not provide regular feedback to their followers.

XYZ Leadership

In 1960, MIT professor, Douglas MCGregor, published a famous book, The human side of enterprise, in which he contrasted two theories of motivation- Theory X and Theory Y. Theory X is based upon the premise that people are lazy, unambitious, and dislike work. These workers either need some form of reward or threat of punishment in order to perform their job. In contrast, Theory Y, describes people who are self-motivated, self-regulated, and find satisfaction in personal achievement. These workers are those who desire to contribute to organisational success. In the 1980's, Dr. William Ouchi offered a third thesis referred to as Theory Z in which the emphasis is on long-term stable employment and total well-being for the worker. The idea was that by providing these incentives, the result would be outstanding employee loyalty and achievement.

Though these theories are decades old since their introductions, they are descriptive of the kinds of people we find in our organisations. The question is, how do you lead your organisation with people who are representative of all three theories?

Characteristics of a good leader

Strong communication : Without a doubt, being an effective communicator is a top attribute of a strategic leader.

Passion & commitment : Enthusiasm for your mission or project will get others excited because they can see and feel your dedication.

Positivity : A positive attitude is contagious innovation.

Collaboration

The traits of an effective leader include the following:

- Emotional stability : Good leaders must be able to tolerate frustration and stress.
- Dominance....
- Enthusiasm....
- Conscientiousness....
- Social boldness....
- Tough-mindedness....
- Self-assurance....
- Compulsiveness.

Emotional intelligence is key to successful leadership.. People who take initiative, who have a vision, and who can strategies, plan, and accomplish goals to achieve their vision are considered good leaders.

Model Questions

Theory 7.3

10 Which one of the followings is traits of a effective leader should have?

A Self-assurance

B Creativity and innovation

C Commitment and passion

D Strong communication

11 What is the name of the leadership style which keeps main emphasis on the distinction of professional relationship with their follower?

A Democratic leadership

B Laissey-faire leadership

C Guide to the following

D Autocratic leadership

UNIT - VIII

INSTRUCTIONAL TECHONOLGY

Learning Outcomes to be achieved from this unit:

- **Plan and use modern training aids to make the communication between trainee and instructor more effective**

Theory 8.1

I Multiple Choice Question items

Choose the correct answer:

1 Which one of the factors below is used in instructional technology

A Interaction

B Standardise

C Set in order

D House keeping

Theory 8.2

2 What is the name of the in teaching that to provide essential date for answering questions?

A Development phase

B Introduction phase

C Organisational phase

D Summary phase

3 In which phase the trainees can present their knowledge or skill in the subject?

A Development phase

B Introduction phase

C Organisation phase

D Summary phase

4 What is the name of the phase in which to provide integrated review of studies to fill gaps in under obtaining, presentation of findings in the summary phase

A Development phase

B Introduction phase

C Organisational phase

D Evaluation phase

5 What is the name of the phase in which for the purpose of conclusion major ideas, generalisation or principles developed through the study?

A Development phase

B Introduction phase

C Summary phase

D Organisation phase

6 What is the name of the term in that the present information which may be through explanation of demonstration?

A Instructional strategies

B Expository strategy

C Discovery strategy

D Information strategy

Theory 8.3

7 What is the name of communication in which the transfer of information from sender to receiver using words and at times visual aids?

A Verbal

B Oral

C Written

D Intro three way communication

8 What is the name of the communication which need commonly accepted meaning for sound to be understand by other and also needs a persons who knows the language and content?

A Verbal communication

B Oral communication

C Written communication

D Intro three way communication

9 Which is the three way communication?

A Verbal

B Oral

C Teaching and learning

D Written

10 In the following which is the physical barrier communication?

A Environment, external

B Science of development of a symbols

C Sounds-bye, ear, hear

D Spelling same, meaning different

11 In the following which is the honour graph communication?

A Spelling same and meaning different

C Sounds

C Value emotion

D Environment

Introduction to instructional technology

Objectives: At the end of this lesson you shall be able to
- **define instructional technology**
- **list the key components of the instructional technology.**

Science is a body of tested knowledge, which may be experienced in the form of a set of general principles. Technology is the process of creatively applying certain known and tested principles to a given practical problem. Thus it is a scientific method for a practical solution/ purpose.

Instructional Technology is a planned innovative activity in instruction. Technology is a product and not a process. We hear "high tech." "low tech." - which means whether they are highly sophisticated / mechanised, little mechanised, or labour intensive - that is between automation and low mechanisation.

Experts have suggested that 'technology of instruction' is the hardware - product type and the software - process type. The former is the use of appropriate equipment in the teaching process, and the latter is concerned with the development of learning experiences through the application of the science of learning.

At the low tech - end of the spectrum are the Chalkboard, wall charts, simple models and real objects. At the intermediate - tech level we have the overhead projector, slide, film projectors, teaching machine and other presentation hardware that are under the control of the instructor.

At the "high tech" end we have a packaged instructional materials, such as instruction through radio, television, Computer Assisted Instruction, dial access information system and multimedia instructional packages utilising computer.

The progress from 'low tech' to 'high tech' is marked by the increased complexity and the sophistication of the hardware and increased need to pre-program, pre-prepare the software content needing specialists for the methodology, content and media packages.

This leads to a progressive role of the human element in the system - the instructor - from planning and executing, selecting or managing the learning situation. From the simple teacher presentation techniques, low or intermediate technology to a 'high sophisticated technology' requires new conditions for learning.

The strong influence of science and programmed instruction in the early sixties was the starting point for the instructional technology. Though the earlier concepts on programmed techniques have undergone considerable change, the instructional technologists adopt the process concept inter-wind with the product concept of "Step - by step learning' and production of learning material for mass consumption.

Do we really have a usable technology of training at the present moment? Instructional technologists should develop and apply methods, which are appropriate to the instructional purpose and situation for solving problem under study.

There are experienced teachers and administrators, who think even today, that instructional technology means audio - visual aids, and technology means equipment. It is high time that the wrong notions and concepts are corrected and for this there is necessary to know in depth the components of instructional technology.

Instruction is a development process to produce certain changes in the behaviour of a learner. Thus instruction to be effective must achieve some stated objectives in behavioural terms.

The process of development must utilize a variety of principles and techniques to develop desired changes of behaviour in order to provide instruction. The instruction thus produced must be of high quality, and therefore quality control is necessary.

Thus instructional technology is a set of principles and procedures used to 'Analyse instruction, Design instruction, instruct, and provide quality control'. This is an approach to produce effective instruction. There are three key components in this approach. They are 1. Instructional Objectives, 2. Interactive Instruction, and 3. Evaluation.

- **Objectives** are precise descriptions of performances the instruction is to produce, stated in terms of the final behaviour of the trainee (we have already discussed about this in detail)

- **Interactive instruction** provides two way communications between the instructor and the trainee. During interactive instruction the trainee is kept active, both the instructor and the trainee to give immediate remedial instruction or correction. Thus interactive instruction is instruction in which the trainee is required to respond frequently to the instruction just like in a tutorial setting, there is continuous exchange of information between the instructor and the trainee, and requires immediate response and feedback that could be easily evaluated is interactive instruction.

- **Evaluation** is the process of testing the trainee and instruction, in order to validate the instruction and ensure the attainment of the objectives by the trainees interactive instruction is easy to validate because the trainee's progress can be checked continuously. When the instruction is not effective, it must be revised.

Different types of Media & its impact in teaching and learning

Objectives: At the end of this lesson you shall be able to
- **explain Instructional media and learning**
- **describe Integration of media in teaching learning sequence**
- **explain Instructional strategies**
- **state the terminologies and describe them.**

Instructional media and learning

Technology helps in choosing appropriate methods, strategies and media for making instruction a congenial process, learning easier, faster and with a purpose and remember longer. All this leads to planned systematic use of media for learning. Thus teaching-learning modes and media gets the top priority in the instructional process. The information furnished below gives various learning media which helps to provide a variety of learning experiences.

Media for Learning

- Text books
- Supplementary books
- Reference books
- Magazines, Newspapers
- Documents, Clippings
- Duplicated materials
- Programmed mateirals
- Motion picture films
- T.V. Programmes
- Radio programmes
- Recordings (tape & disk)
- Flat pictures
- Drawings & paintings
- Slides
- Transparencies
- Film strips
- Micro films
- Stereographs
- Maps, globes
- Graphics, charts, diagrams
- Posters
- Cartoons
- Puppets
- Models, mockups
- Collection, specimens
- Flannel-board materials
- Chalkboard of materials
- Magnetic board materials
- Construction materials
- Drawing materials
- Display materials
- Multi-media kits

Media for Learning

How many of the above are essentially visual in nature?

How many involve the element of sound?

Which of them are combined chiefly of representational visual elements, sound plus visual representation in combination?

Which of them are elements from real things?

How many will be created by the instruction or trainees?

The above chart is titled Media for Learning, not Learning Aids or Audio Visual Aids. The nomenclature is intended to emphasise that these medias are basic essential ingredients for effective, dynamic instruction, rather than tacked-on aids to the process.

Instructional Media is an instructional input in the teaching-learning sequence. The instructional technology approach emphasises that media and learning experience of many kinds are used in various ways for different purposes in five phases of the teaching-learning sequence.

They are

- Introduction
- Development
- Organisation
- Summary
- Evaluation

General principles that apply to uses of media in each of the five stages just mentioned are

- No one medium is best for all purposes.
- Media use should be consistent with objectives.
- Users must be familiar with the content of media selected.
- Media must be appropriate for the mode of instruction.
- Media must fit trainee learning styles and capabilities.
- Media are neither good nor bad simply because they are concrete or abstract in nature.
- Media should be chosen objectively, rather than on the basis of personal preference or bias.
- Physical conditions, surrounding uses of media may affect significantly.

Integration of Media in the Teaching-Learning sequence

A further element of key importance in the process environment for the systematic instructional technology approach for instructing and learning involves integration of media in the teaching-learning sequence. We will now examine the five phases of the teaching-learning sequence and the function of media in each of the above five phases.

Introduction phase (motivational, exploratory), materials especially which raise questions, excite interest, provide interesting overview and which allow trainees to demonstrate their present knowledge or skill in the subject.

Development phase (goal setting, location and study of informational materials, individual and group work toward solution of problems) : Materials especially sought during the phase to provide essential date for answering questions as they arise.

Organisational phase (pooling of results of research and study; presentation and integration of findings) : Materials needed here to provide integrated review of studies to fill in gaps in understanding, to prepare for presentations of findings during the summary phase, which follows.

Summary phase (a series of unit culmination activities): Sometimes involves individual and committee presentations, visual display, dramatisations, discussions for the purpose of summarising major ideas, generalisation or principles developed through the study.

Evaluation phase (appraisal of results) : Conducted regularity, but especially necessary at the conclusion of a unit of study. Testing of trainees, evaluations of learning products, expressions of trainee opinions with regard to the continuing value of various activities and approach used in the study; determinations of changes and improvements needed if a similar study is undertaken with another group; special attention to used of non-verbal materials in evaluating understandings, appreciation, skills.

These five phases of the learning sequences are discussed in more detail in the lesson planning earlier. Here it is emphasised that the media is not to be considered as a separate aid or adjunct in the learning process, but an input in the learning strategy, to be integrated in the teaching-learning sequences.

Instructional Strategies

We have discussed this is training methods. We also discussed in this chapter various planning methods. The discussion will be incomplete without the integration of plans with tracks and strategies. Let us examine these aspects and link them with the theories of instruction.

Overall instructional strategies are the translation of philosophies or theories of instruction into a statement of the way in which instruction should be carried out in specific types of circumstances. Chapter 2 and Methods in chapter 3. Let us now examine some of the process of the learning forming part of the instructional strategies.

Model of Instruction decision

Reception learning also called information processing, is the process by which much of institutional learning takes place. Its main steps are

- Reception of information, concerning a general principle or rule and using specific examples as illustrations.
- Understanding of the general principle. This can be tested by tests requiring restatement of the principles or giving examples.
- Particularising is ability to infer a particular application from the general principle, tested by explaining how a general principle, applies in a particular instance or what general principle applies to the particular instance
- Acting is moving from the cognitive and symbol processing sphere to the spheres of action. It involves the use of the information received by reception, applying it to real problems.

Application of	in the light of	to determine
1 Philosophies and theories of instruction	• Final objectives • Target population • Wider population	Instructional strategies
2 Instructional strategies	• Specific objectives • Entry skills • Resources and Constraints	Instructional Plans (methods, sequencing)
3 Instructional plans	• Content • Enabling skills • Skill & knowledge taxonomies	Instructional tactics (each step for each lesson)
4 Instructional tactics	• Actual practical exercises in applying them to specific learning-teaching problems	Specific instructional exercises (in any medium)

Experience processing (or experiential learning) follows a reverse sequence.

- Acting in a particular instance. One carried out the action and then sees the effects. The effects may act as rewards punishments as in operant conditioning or may simply supply information about cause effect relationship that exists.
- Understanding the particular case, so that if the same set of circumstances reappeared, one could anticipate the effects. The person has learned the consequences of the action, thus has learned how to act in order to obtain his goals in this particular case.
- Generalising an issue from the particular instance to the understanding of the general principle under which the particular instance fails. This may require action over a range of instances before the general principle does not necessarily imply an ability to express it in a symbolic medium such as writing.
- Acting in a new circumstance, to which the principle applies and anticipating the effects of the action.

The two strategies that spring from these processes of learning would be an Expository strategy and would have the following steps.

Expository strategy

- Present information. This may be through explanation (symbol) or demonstration (practical).
- Test for reception, recall and understanding. Repeat or rehearse the message if it proves to be necessary.
- Present opportunities for practice for applying general principle to a range of examples. Test for correct application. Modify the quantify and difficulty of the examples as necessary, to ensure correct performance.
- Present opportunities for the application of the newly learned information to real situations and problems.

Discovery strategy

- Present opportunities to act (do) and observe the consequences of one's action.
- Test for understanding. This may be done by questioning or simply by observation of the reactions of the learner. Present further opportunities to act (do) if this proves necessary
- Enter by questioning or by observing the further activities, test for the formation of the general principle underlying the cases presented. Present further actions until the general principle has been learned.
- Present opportunities for the application of the newly learned information to real situations and problems.

Variations

Thus we have continuum of discovery/expository strategies ranging from a totally free discovery to a totally controlled rote learning.

Impromtu discovery	Unplanned learning - involved - use of library or resource centre
Free expository	Learner is free to choose from resource centre or library from broad goals that are fixed. (Bruner's approach)
Guided discovery	Objectives fixed. Learner guided to appropriate methods. (Gagne's approach)
Adaptively programmed discovery	Guidance and feedback correctly given on individual basis (Computer assisted learning systems).
Intrinsically programmed discovery	Guidance and feedback according to a Preplanned programmed, based on the typical learner (Programmed materials)
Inductive exposition	The teacher talks through discovery process. Reflecting lecturing.
Deductive exposition	The meaningful reception learning process (Ausubel) Mainly lectures.
Drill and practice	Rote reception learning: Instruction demonstrates what to do and provides practice. No conceptual understanding is necessary (memorisation)

Instructional Technology

Many methods have been discussed in Chapter - 3. Most strategy decisions depend on the test and control sub systems. These interact with the instructional process. The output is controlled normally by the strategic decision between norm-referenced and criterion referenced measures of evaluation. Do we compare trainees with each other or to a quantified standard or criterion of terminal performance? Another important strategy decision concerns what we should do if trainees fail to perform to required standard. Do we adopt the mastery learning strategy or the individual development strategy of output control? This later decision is closely bound to one's choice of instructional strategy. The mastery learning strategy is quite incompatible with the principles of free exploratory discovery (Bruner's) but quite compatible with guided discovery strategy (Gagne's). Finally about the control, we should decide as to who is to exercise the control over inputs. The teacher, the learner, the mediated system or some combination of these. The decision interacts with instructional methods and media. Bruner advocated a free discovery approach whereas Skinner and Ausubel argues for an expositive guided discovery approach.

Education and Training must develop the learning skills of the learner and should make specific planned efforts to do so. In developing an instructional system aimed specially at the development of cognitive skills, one may select content which is particularly suitable as a vehicle for the development of these skills, but which has no special value to the learner as knowledge. It is therefore considered in the interest of proper development of trainees, that a combination of expositive and discovery strategies are used.

The strategy to be adopted depends on

- Whether you are dealing with information or performance?
- Whether, the knowledge is factual information, concepts, procedures or principles or combination?
- Whether the skill is basically a reproductive skill or a complex productive skill or a combination of these?
- What resources you have, what is the target population like and what are the special pressures that affect the trainees and the system as a whole.

Considering the restriction these constraints impose on your selection of specific instructional methods and select a method or several alternatives, that is (are) both appropriate and viable, in the light of the consideration outlined above.

Terminologies

We have used in various parts of this book, used terms instruction, instructional system, technology, objective, media, method, strategy, plan, tactic, exercises and process to describe various aspect of 'what the instruction will do during instruction'. It has now become necessary to recapitulate and discriminate the meanings described to these terms.

Instruction is a goal directed teaching process which is pre-planned. It is always necessary to identify the pre-determined goals and objectives.

Instructional system: The presence of precise goals and objectives and the presence of careful pre-planning and testing out shall be taken as the main characteristic of instructional system.

Instructional system design is a three phase process of establishing precise and useful objectives, planning viable routes to achieve the same and testing them out.

Instructional Technology is a term which has been used in so many contexts by many. It can mean in a sense any planned instructional activity incorporating innovative scientific principles. It is a set of principles

and procedures used to analyse instruction, design instruction, instruct and provide quality control. It is a system approach to instruction. It is a development process that utilises a variety of principles and techniques in order to develop instruction that achieves its objectives.

Instructional objective is the description of the form of the behaviour that instruction is to produce, state in terms of what the trainee (student) is to be able to do (explain, describe, discuss, solve, manipulate, etc.,) the conditions under which the action is taken and where appropriate, a standard of accuracy or speed. The behaviour described or its consequences should be observable and measurable.

Instructional Media: Media is the carrier of message from transmitting source to the receiver of the message (may be learner). Instructional Media are direct instructional inputs and essential ingredients in the teaching-learning process. They are not mere aids. All media teach and are part of instruction.

Instructional Methods: This is a term used to mean, ways of doing something for the purpose of instructing. There are some commonly recognised methods of instruction, such as the lecture method, lesson method, the discussions method, the tutorial method, the demonstration method, etc. One can invent many methods of instructing depending on the situation and necessity. It is a decision making process and application of creativity.

Instructional Strategies are general view points and line of action that one adopts in order to choose the instructional methods. Decision of strategies are taken quite early in the instructional design process. A strategy which advocates, active participation of the learner in the lesson, will tend to minimise the use of the lecture method, wherein the learner in relatively passive and promote the choice of more learner active methods, such as group discussions and seminars, project work, tutorials and self-instructional packages. It is the mix of the methods for the particular objective resulting in differentiated strategy that ends up with a good instructional plan.

Instructional plans are the specific combinations of methods that one decides to adopt in a given course of instruction. The plan incorporates the different objectives for the necessary content, strategies and media.

Instructional Tactics are the specific ways that one chooses to implement a particular case. There is some problem of adopting tactics without knowing the styles of learning of the students/trainees. Methods are ways of getting the students to do a particular course by organising lessons or lectures, whereas tactics are detailed steps of instruction in a lesson. Instructor training is more concerned about tactics. Tactics must be matched to detailed objectives by means of some type of classification, taxonomy. The matching takes place at a time level and the lesson plan must specify in depth what will occur or should occur at each step of the lesson. The instructional plans fail because the instructors have not learnt to match tactics to objectives or they are poor in specifying objectives and/or in lesson planning. It is a dangerous practice to have no lesson plan at all.

Instructional Exercises are the actual activities and events that occur when a particular tactic, or a set of tactics that make up a lesson, are put into practice. Thus the tactics suggested for the teaching of concrete concepts will give rise to quite a different concept to be taught. The choice of the examples, their sequencing, how many and so on, are all decisions that are made at the exercise design level. It is necessary to present example of a variety, them test with different examples, in order to measure the analysis and synthesis level. Exercises are what the learner gets involved with. He may never be conscious of the strategic planning and tactical decision that lie behind the actual exercises. But all those prior decisions are made in order to ensure that the learner does actually learn from the exercises. The success of instruction, depends on the measure of the success that the learner has with the exercise finally developed. The quality of instruction depends on the thorough or deep analysis of the learning elements, followed by the application of appropriate instructional tactics in efficient practical ways.

Instructional process is a very complicated one. In order to maximize the instructional outcome, the instructional process must be designed effectively. During the process, a trainee is faced with the learning situation from the various planning strategies and the environment, to exhibit different behaviours when the instruction is complete. This change in behaviour is measured by the test and control. In order to be successful, one should have answers to the following questions.

- What should be achieved? (desired outputs or objectives)
- With what? (inputs-content, learners, resources)
- In what context? (the environmental climate and constraints)
- When? (the sequence of events that should occur)
- How? (the strategies, methods and tactics that should be used)
- Who? (the structure and grouping to be used)
- With what? (media to be used)
- How well? (the tests and controls)

We will discuss in the following chapters in detail, the Analysis of knowledge and skills, sequencing, evaluation, planning for instruction and organisation of physical facilities and resources and management of training area.

A companion volume is planned which will deal in detail the function of Instructional Media and essential process of training-learning aids.

Principles of Teaching Instructional Technology — Theory 8.3

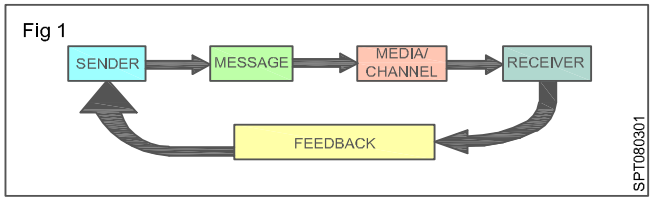
Class room communication

Objectives: At the end of this lesson you shall be able to
- **define communication and list the elements**
- **classify the communication and explain each of them**
- **describe the 7C's of communication**
- **explain the listening skill and their tips for improving**
- **brief the requirement for effective presentation/ communication in classroom.**

Classroom communication

Communication is defined as the process of sending and receiving understandable information from one person to another. A significant point about communication is that it always involves minimum of two people - that is, a sender, and a receiver, a message, a medium (channel) for the communication to take place and of course a feedback for the sender as a response from the receiver, as shown in Fig 1.

Fig 1



Elements of communication

Media are the carrier of message / information. There are four types of media used for the communication. They are

- Audio (verbal communication - spoken language, sound, signals)
- Visual (written - printed - picture, graphics, symbols etc.)
- Audio visual (both sound and visual information - like motion pictures)
- Action (non - verbal, signs/ signals - audio visual, television)

Communication can be classified as:

- One way communication
- Two way communication
- Verbal communication
- Non - verbal communication
- Inter personal communication
- Inter - communication
- Intra - communication
- Mass communication
- Formal communication
- Informal communication

Two way communication is effective communication method in general as shown in Fig 2.

Interaction between the Instructor and the trainees is the core of the teaching learning process. This interaction through effective communication the Instructor is able to deliver the subject matter to trainees; by processing the received information the trainee gives the feedback though verbal and performance testing. This results in behaviour changes in learners as shown in Fig 2.

Verbal Communication

Unlike non - verbal communication, verbal communication needs commonly accepted meanings for sounds to be understood by others. In order to communicate it needs a person who not only knows the language but also the cultural context, underlying relationships between the people involved in communication and other relevant details. Verbal communication could either be oral or written. Not all verbal communication is planned and systematised. Animals and birds too use verbal communication, but they have their own language of sounds, grunts, barks, chirps etc., each having its own meaning.

We can also further divide communication as formal and informal communication. A meaning of a sentence changes depending on the context. If a sentence spoken in an informal set up means one thing, would probably mean something else in a formal context.

Oral and written communication

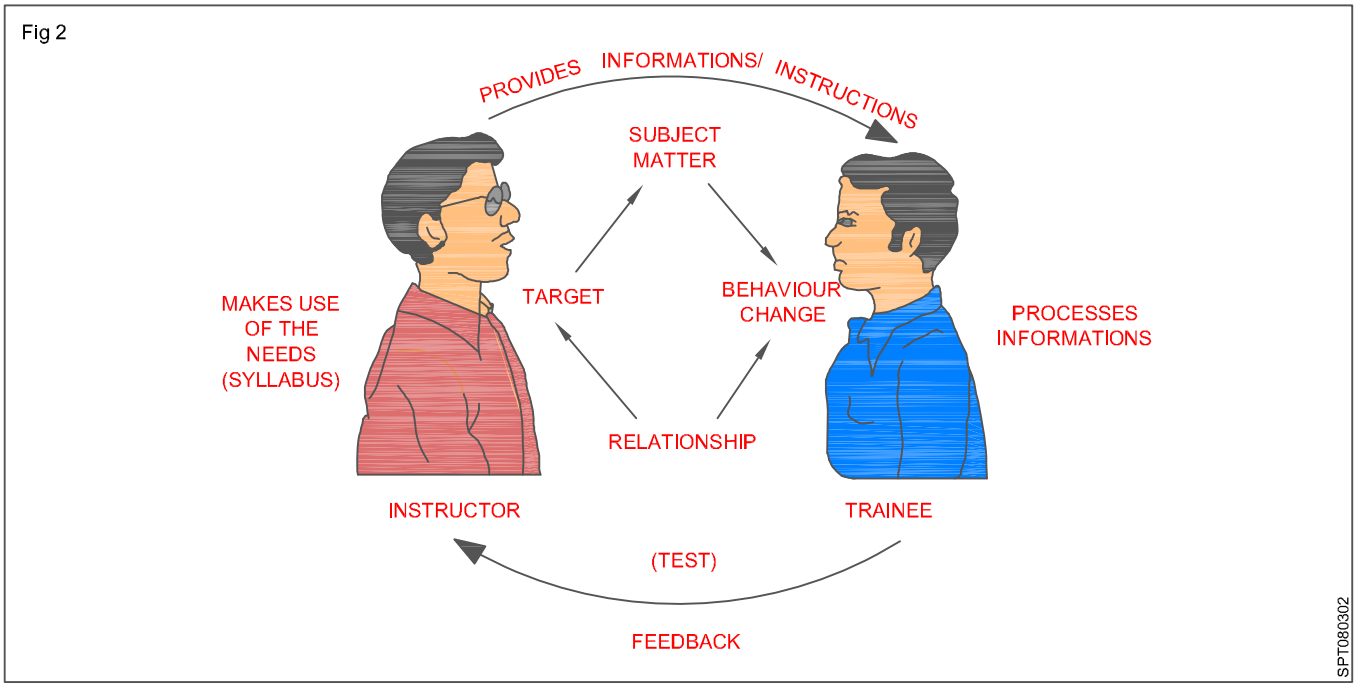
Oral communication is the transfer of information from sender to receiver using words and at times visual aids. Examples of oral communication include discussions, speeches, presentations and face interaction. For effective oral communication, we need to have clarity, brevity (using few words) and precision in our communication.

Benefits of oral communication:

- It is quick and direct method
- Feedback is immediate be it praise or criticism

One problem with this communication is that it cannot be used for documentary evidence.

Fig 2



Written Communication

Any form of communication that is written and documented from the sender to the receiver is known as written communication. Examples of written communications are letter, memos, academic research paper, reports, newspaper etc.,

Written communication has the advantage of providing records, references and legal evidences. It should have clarity, correctness and logical continuity. In this communication we will not get immediate feedback.

It has its own limitations as it does not have additional help from body language and tone of voice.

Choosing the right words in verbal communication

“Good words are worth much and cost little” by George Halic Herbert

In order to communicate our message to our listeners, we need to choose the right words that clearly express our thoughts. Very often in both informal conversation and public speaking, we make statements that are not very clear. For example:

- Unclear: Let’s go to a place where they sell those things we need for the office.
- Clear: Let’s go to the bookstore that sells books and school supplies.
- We should use simple words and phrases rather than the complex or difficult ones.

Simple Words	Difficult words
dislike	abhor
increase	abound

- We should use precise words that expresses our thought and feeling accurately. Avoid using vague words. It confuses the listener and does not clearly expresses our intended meaning.

  Vague: We had a bad meeting yesterday.

  Precise: We had a disorganized meeting yesterday.
- We should use specific words- these identify items within a category while general words refer to an entire category. Specific words help our listeners to form a picture in their minds of the exact images we want them to see.

  General word: The purchasing officer bought a lot of THINGS at the book store.

  Specific word: the purchasing officer bought pencils, brown envelopes, white board pens, and bond paper at the bookstore.
- Avoid repeated use of ‘filler’ and favourite’ words in your conversation some people have an habit of using them all the time. They add nothing to the conversation, are completely unnecessary and can be very distracting and annoying.

  Filler words are words like ‘you know’, ‘sort of’

  Favourite words are words like ‘obviously’, actually’, basically’.
- Avoid using jargons, acronyms, abbreviation, Jargon is familiar to the people who are in the same group and not outsider.

Email

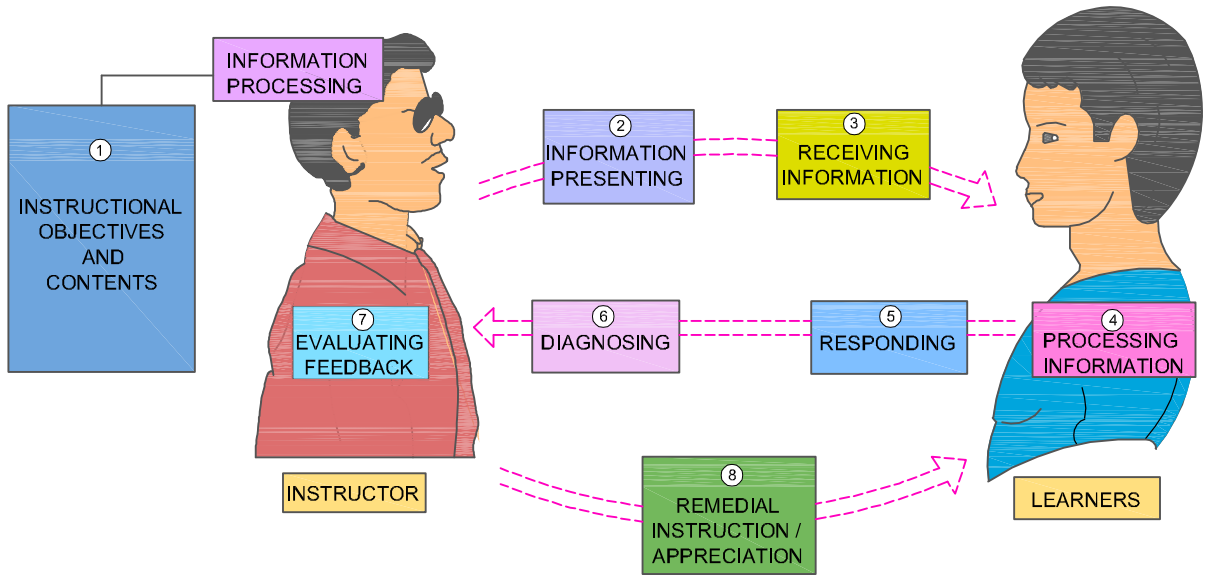
Electronic mail or email is an important means of communication in the modern world. Using e-mail one can have a message delivered within minutes to anyone in any part of the world. By the use of encoding and decoding process at both the ends it can carry audio, visual or actions converted into electronic signals. The only condition is that both the sender and the receiver should have an Internet account or at least access to an internet connectivity.

Three - way communication for teaching learning

The three-way communication model is shown in Fig 3. Teaching learning process using the three-way communication process consists of eight steps of activity.

A learner needs the help of the Instructor when he wants to learn any new subject and to solve any problem. The process of guiding the trainee for learning is explained below:

Fig 3



A THREE WAY COMMUNICATION MODEL

In step-1 and step-2 the Instructor is processing the content as per the instructional objectives and present the information to the learners (trainees).

In step-3 and step-4 the learner receives, processes the information and responding (step-5) to the Instructor accordingly.

The Instructor diagnoses (step-6) the learner's response and evaluates the feedback (step-7). Depending upon the response, the Instructor appreciates the learner for correct understanding or gives the remedial instruction (step-8) in case of misunderstanding.

The formative evaluation in step-7 and step-8 are important to conduct the effective teaching learning process. The feedback information which has many types.

The formative evaluation in step 7 and step 8 are important to conduct the effective teaching learning processes.

The feedback information which has many types. For examples, in responding to his behaviour, teacher, say: “good.” “wrong”, “no”, “well”, “humm”, “wonderful”, “interesting” and some times repeats and summarizes learners opinions. Sometimes teacher gives many non-verbal communication like nodding, smiling, winking and making gestures.

The barriers of communication

- **Physical barriers** (Environmental, external)
- **Semantic barriers** (science of development of symbols)
- **Multi valued words**: **Homo phases** (sounds - Eye, I; ear, hear)
- **Homograph** (spelling same, but gives different meaning different) slip, fan
- **Psychological/ personal/ social barrier**s - Value, emotion, judgement, feeling, zonal etc.,

The expectation of communication

The usual communication at work involves more than receiving, there is also an expectation of **understanding, acceptance, assimilation and action.**

A communication may make others to hear him, but he cannot make them to understand him. **"Understanding"** is required for effective communication. Understanding is personal and objective and it can occur only in the receiver's mind.

Communication aspects

- **Physical aspects:** Voice modulation, Eye contact, standing posture, Gestures (body languages).
- **Academic aspects:** How to introduce the subject, Objectives/ developments, giving examples whenever necessary and conclusions.
- **Understanding the receiver:** I know type, Emotional type, understanding social, economical status and responsibility.

Classroom communication

To make the classroom communication more effective the instructor should ensure that the receiver (trainees)

- Receives the message
- Understands the message
- Accepts/ assimilates the message
- Uses/ applies the message
- Gives the feedback.

7Cs of communication are as follows:

- **Clear:** Choose short, familar and conversational words, construct effective sentences using simple languages.
- **Complete:** Answer all the questions, give examples and use illustrative visual aids. Give something extra whenever required. check for 5W's and 1H. (What, Why, When, Which, Who, How)
- **Correct:** Use correct level of language, relevant figures. Use and show non- communal, religious, regional matters.
- **Concise (Brief):** omit confusing message, Avoid unnecessary repetition, Include related facts only. Organise more effetiveness.
- **Courteous:** Be sincere, appreciate, tactful and thankful. (Omit irritating words which will hurt others.)
- **Concrete:** Use specific facts and figures. Put action in verbal communication. Choose image building words. Grant and apologize whenever necessary.
- **Candid:** Feel to speak and frank to accept the trainee's view point.

Major barriers in organising communication are as follows:

- Badly expressed message
- Failure to select proper medium
- Loss by transmission and poor reception
- Treating inferences as facts.
- Premature evaluation
- Boss conscious and fear
- Feeling of insecurity
- Disturb/ lack of faith on communication
- Insufficient adjustment period
- Inattentive
- Listening to grapevine
- Misinforming with facts
- Failure of communication

Listening Skills

Listening skills play a major role in the success of one's communication skills. Only a good listener can be a good speaker.

Nobody is born with good speaking skills at the time of birth. A baby starts speaking, only by listening to the words spoken by his family members.

It is assumed that when the teacher is teaching, students listen. But this is not true. Students do hear, but they don't really listen.

All students do not listen in the same way. But this is not very obvious to the teacher who continues to lecture to students who hear the lecture, but not actually listen to it.

Hearing Vs Listening

Hearing is simply the act of perceiving sounds by the ear. Hearing is just a physical activity. Listening, however, is something you consciously choose to do. It requires concentration so that your brain processes meaning from words and sentences. Listening leads to learning.

Listening

Listening is an active process by which students receive, construct meaning from, and respond to spoken or nonverbal messages. (Emmert, 1994) Listening makes the other person feel worthy, appreciated, interesting, and respected.

Ordinary conversations become more meaningful, as do our relationships. When we listen, we foster the skill in others by acting as a model for positive and effective communication. We always learn more when we listen than when we talk. Listening skills fuel our social, emotional and professional success, and studies prove that listening is a skill we can learn.

Active Listening

Active listening is not just decoding of words but considering other factors when interpreting message - context, personal experience and feelings, facial cues, pitch, loudness and rhythm. A simple verbal message will not give complete meaning. The context, the personal relationship, facial cues, the way the message is delivered colours the meaning of the verbal message.

Triple-A-Listening

Good listening is built on three basic skills: Attitude, Attention and Adjustment. These skills are known collectively as Triple - A - Listening.

Attitude: A constructive attitude is to be maintained for good listening. It paves the way for open mindedness and prepare for mental reception of orally presented material.

Attention: Attention is to encourage persons to be active in their attempts to concentrate. When you actively listen, words enters into the memory where they are processed into ideas.

Adjustment: Adjustment in listening helps to obtain the desired information no matter what the presentation style or distraction might be. Adjustment encourages students to ask questions if they don't understand it.

Tips for Active Listening

1 Face the speaker. Your body language should reflect your interest in the message you are listening to. Sit up straight or lean forward slightly to show your attentiveness through body language.

2 Maintain eye contact to the extent to which both the listener and the speaker remain comfortable. If there is no eye contact, it reveals your disinterest in talk/ conversation.

3 Minimize external distractions. Turn off the television and mobile phones. Put down the magazine or book which you are studying.

4 Respond appropriately to show that you understand. Responses like 'umm', 'really', 'oh', 'what happened then' etc show that you are listening.

5 Focus solely on what the speaker is saying. Try not to think about what you are going to say next.

6 Minimize internal distractions. If your own thoughts keep intruding, simply let them go and continuously re-focus your attention on the speaker.

7 Keep an open mind. Do not make any assumptions about what the speaker is thinking.

8 Engage yourself. Ask questions for clarification, but, once again, wait until the speaker has finished. That way, you won't interrupt their train of thought. After you ask questions, paraphrase their point to make sure you didn't misunderstand. For example, 'So you are saying…'.

9 Wait for the speaker to complete what he wants to say. Even if he is complaining against you, wait for him to finish. Then you can defend yourself.

10 Do not give advice unless the speaker asks for it.

Types of Listening

- **Comprehensive (Informational) Listening**

  In this type, we listen for getting some information. Listening to railway or flight announcements or listening to the teacher's lectures, listening for any kind of information will come under this category. The content of the message is very important.

- **Critical (Evaluative) Listening**

  As you listen to the message, you don't just get the information, you also judge the message. You evaluate using your own critical thinking skill and understand the message based on your thinking. Listening to questions in an interview fall under this category.

- **Appreciative (Aesthetic) Listening**

  This type of listening is basically listening for pleasure. Listening to songs or some kind of pleasure falls under this category.

- **Therapeutic (Empathetic) Listening**

  Sometimes we listen not for getting information or pleasure. Being social beings, we need to interact with other people. At times, we end up listening to other people's problems.

Skills Associated with Listening

- Listening for the main idea - students listen to identify the overall ideas expressed in the whole speech/ talk/ conversation/ recording.
- Listening for details - students listen for groups of words and phrases at the sentence level.
- Listening for specific information - students listen for particular information at the word level.
- Predicting - students try to guess key information contained in the speech sample before they listen.
- Inferring meaning - students listen to identify the difference between what the speaker says and what they actually mean.
- Identifying emotion - students listen to identify the mood of certain speakers.
- Listening for opinions - students listen to identify the attitude of certain speakers.
- Inferring relationships - students listen to identify who the people speaking are and what the relationship is between them.

- Recognizing context - students listen to audio/ background and contextual clues to identify where the conversation takes place, who is speaking, etc.
- Retaining chunks of language - student are able to retain language so that it improves their speaking skills too.
- Recognising stress patterns, rhythmic structures, functions of stress, intonation to help in their pronunciation
- Recognising grammatical word classes - improves their knowledge of grammar structure
- Detecting key words
- Identifying coherence in discourse
- Knowing the difference between literal and applied meaning
- Detecting sentence constituents

There are many more sub skills involved in listening skills. But they are in a way connected with the above skills/ sub- skills.

Benefits of developing good listening skills

(i) Successful Time Management

Learners with good listening skills generally follow directions correctly the first time they are given. This means they spend more time on the task, not on asking for clarifications. Active listening skills enable Learners to use their time more judiciously.

(ii) Educational Success

Learners who are active listeners use new information more productively. They are better equipped to access their prior knowledge, which allows them to make connections with new information. It also enables them to decide how to use this information. Active listeners filter information, connect to what is important, use it and store it in a meaningful way. In consequence, they often seem to have a better grasp on academic content than their friends who listen more passively.

(iii) Interpersonal success

Active listeners tend to have more successful interpersonal relationships. Their active attention supports the speaker and helps build his confidence. As the speakers feel that they are genuinely listened to, they feel they are valued. This promotes feelings of trust and respect which in turn makes the speaker more likely to co-operate with the listener in even future endeavours.

Tips for improving communicative skills

- Find out what your listener wants. (Plan your communication well)
- Think before you talk. (Know what you want to say)
- Write a purpose statement. (Believe in your message)
- Select proper channel (Sound, picture, Action) and follow.
- Tell it right. (Get to the point quickly)
- Use mind mapping. (Explain abstract words)
- Control fear (Encode and decode properly)
- Ask questions. (Avoid daydreaming)
- Summarize. (Repeat major points)

Classroom techniques for communication

Voice

- Speech must be clear and free from grammatical errors.
- Always use simple language.
- Pronunciation must be clear.
- Speech must be forceful and purposeful.
- Voice must be well modulated and must be pleasant.
- Delivery of speech must be such that everyone feel that you are addressing him personally.
- Important points must be emphasised by raising the pitch of voice.
- Do not shout, Mumble or whisper.
- Adjust the speed with which you cover the subject matter to the level of the learners.
- There should not be undue pauses and unnecessary repetition of words while speaking.

Gesture

Purposeful movement of body to convey an idea to supplement oral statement. It may be the movement of Eyes, Head, Hands, Facial expressions with purpose to convey or emphasise the message. Over done becomes mannerism; be cautious.

Posture

- Always stand in front of the class while teaching.
- Supervise the learning activity.
- Never stand showing your back to the class.
- Break monotony and make use of humour.
- Always make the trainees laugh with proper learning.

Principles of Teaching Instructional Technology — Theory 8.4

Different types of teaching - learning aids (projected and non projected aids)

Objectives: At the end of this lesson you shall be able to
- **explain classification of various aids**
- **state the principle selection and utilization of aids**
- **explain integration of aids in teaching, learning situations.**

Introduction: Instructional media is an Instructional input in the teaching - learning sequence. The Instructional technology approach give more prominence that media and learning experiences of many kinds are employed in various methods for different purpose of the teaching and learning.

The different purposes are as follows:

- Introduction
- Development
- Organization
- Summary
- Evaluation

The general concept that apply to uses of media in each of the steps shown above are:

- No media is best for all purposes
- Use of media should be consistent with objectives
- Trainees / user must be formulation with the content of media selected.
- Media must be appropriate for the mode of instructions
- Media must fit trainee learning styles and his capabilities
- Media are neither good not bad simply because they are concrete or abstract in nature.
- Media should be chosen objectively, rather than on the basis of personal preference or basis.
- Physical conditions, surroundings uses of media may affect significantly the results obtained.

An instructor conventionally teaches through a lecture or demonstration and dictates notes. He may also use a chalk board and some times refer books. As this allows learning to take place, there are other methods to improve learning. That is instructor can use aids during instruction, to transmit skill to learners, attitude, knowledge facts, understanding and application.

The training aids are classified as per their applications.

Classification of various aids are as follows.

1 Visual projected aids
- a Film strip projector
- b Over head projector
- c Opaque projector
- d Multimedia projector
- e Interactive/Smart board

2 Visual non projected aids
- a Models
- b Mockup
- c Graphic aids
- d Field trips
- e Industrial visits

3 Audio aids
- a Radio
- b Tape recorder
- c CD/DVD players

4 Audio visual aids
- a Sound films
- b Television

Selection and utilization of aids

" We remember 20% of what we hear

we remember 30% of what we SEE

We remember 50% of what we SEE & HEAR

We remember 90% of what we SEE & DO"

"I hear something, I do not remember"

"I See something, I understand something"

"I do something, I LEARN something"

Teaching aids are the tools that instructor use them in the classroom such as flash cards, maps, cassette and chalk board.

A teaching aids is a tool used by the instructors to help learners improve reading and other skills, illustrator or reinforce a skill, fact or idea, and since many teaching aids are like games.

Table 1 shows the classification of audio visual aids.

Table 1

CLASSIFICATION OF AUDIO VISUAL AIDS						
PROJECTED & NON PROJECTED AIDS						
NON PROJECTED					PROJECTED	
picture, charts, maps, graphs, puppets, flash cards poster	DIPLAY BOARDS- bulletin board, flannel board, magnetic/ White board specimens	3-D AIDS- globes, models, objects, field trip	AUDIO AIDS-radio taperecorder language laboratory	ACTIVITY AIDS-CAI demonstra-tions dramatics experiments, Programmed instruction	SILENT- slides film strips OHP Interactive/ Smart Board	SOUND- films

Fig 1 The cone represents the strategy of activity of learning.

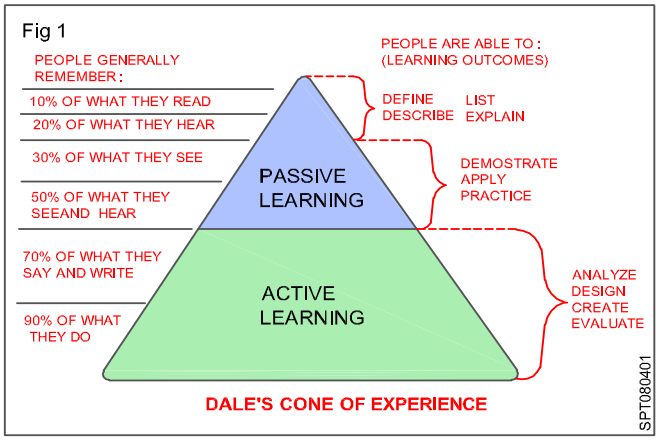
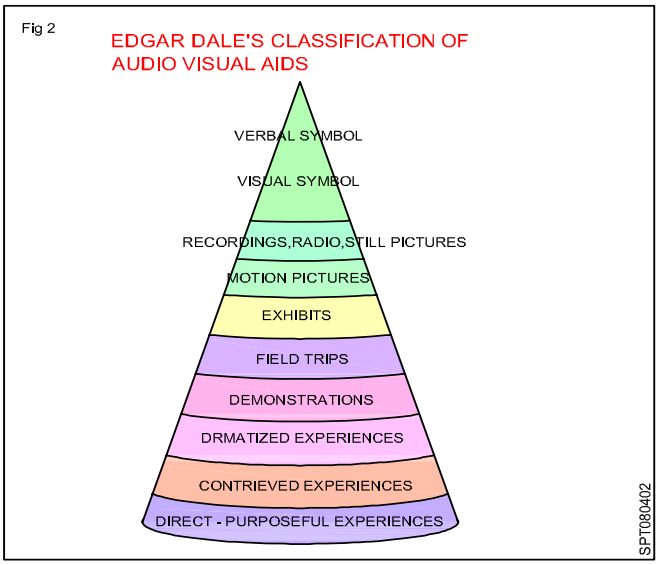


Fig 2 shows Edgar Dale's classification of audio visual aids.



Need and importance

- Clarity
- Attention and interest
- Best motivators
- Use of maximum senses
- Saving time & effort
- Fixing and recalling the knowledge
- Meeting the individual differences
- Encouraging activities
- Introductory variety
- Development of scientific attitude
- Direct experiences
- Promotion of international understanding

Principles of selection & effectiveness in use

Principle of selection

- Educational value
- Realization of objectives
- Learner centeredness
- Interest and motivation
- Simplicity
- Relevance and suitability
- Accuracy
- Encouragement
- Well preparedness
- Avoiding too many aids

- Means to an end
- Integration
- Availability of resources - size of classroom, finance, facilities, experienced teachers

Principle of use

- Preparation - awareness, teacher's preparation, learners participation
- Proper presentation - handling, checking, timely presentation, avoiding distraction
- Protection and preservation
- Action
- Follow up
- Evaluation

Chart

A chart is a useful way to present and display information or instructions, especially in a classroom or other educational situation. It can range in size from a large wall chart to a single piece of paper.

According to Edgar Dale, " a chart is a visual symbol summarizing or comparing or contrasting or performing other helpful services in explaining subject matter"

Types of Charts

- Picture chart
- Time chart
- Table chart
- Graphic chart
- Flow chart
- Tree chart
- Pie chart

Flash cards

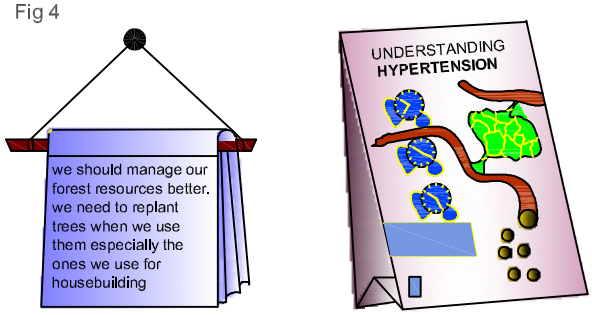
- Flash cards are useful for drilling new letters, words, and other information. They are normally used in a classroom, but can also be used more informally.
- A flash card is part of a set of cards on which are written items to be studied. They are 'flashed' (shown quickly) one by one to a learner to elicit a quick response.
- Flash cards are sets of cards printed with information to be studied, such as
  - definitions
  - formulas
  - letters
  - multiplication tables
  - prefixes
  - words.
- If there is an answer or solution to what appears on the front of the card, it is printed on the back so that the person showing the cards can see if the learner's answer is correct.

Flip charts (Fig 3 & 4)

- Flip charts are useful in teaching situations where you need to teach a number of people at a time. They are used when books are unavailable, scarce, or too expensive for individuals to have their own copy when other media such as overheads and slides are not available, and where group learning is most culturally appropriate.
- A flip chart is a collection of large pages which are bound together at the top. The pages are "flipped" or brought up and to the back as they are used.
- The pages can be easily turned and lie flat.

Fig 3 FLIP CHARTS

Fig 4



Flannel board (Fig 5)

It consists of a piece of flannel or felt made from wool, stretched tightly over a strong backing of plywood. Pictures, cards and similar material can be made stick on it.

Fig 5

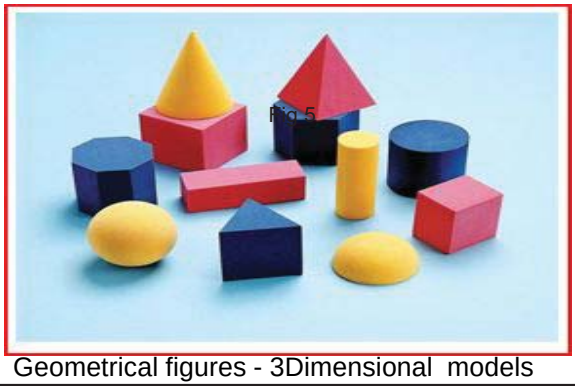
Model (Fig 6, 7 & 8)

Models are replicas or copies of real objects with suitable change in size, complexity, timing, safety and cost factors.

Classification

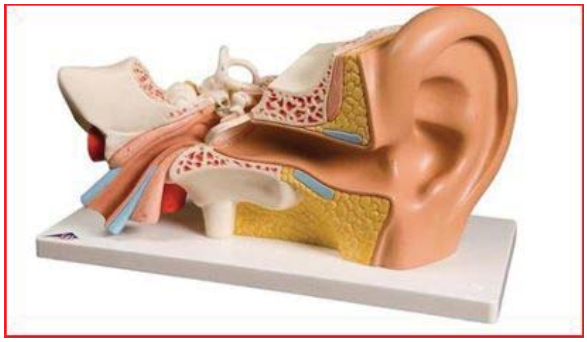
- Simplified
- Scale
- Working
- Cross - sectional
- Mock-ups

Fig 6



Geometrical figures - 3Dimensional models

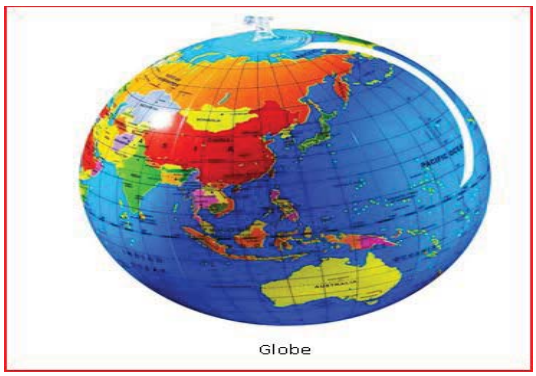
Fig 7



Sectioned model - Human ear

Globe is a spherical model of earth.

Fig 8



Globe

Graphs (Fig 9 & 10)

- Flat pictures which employ dots, lines or pictures to visualize numerical and statistical data to show statistics or relationships.
- Graphs are by nature a summarizing device.
- Effective tools for comparisons and contrast.

Fig 9

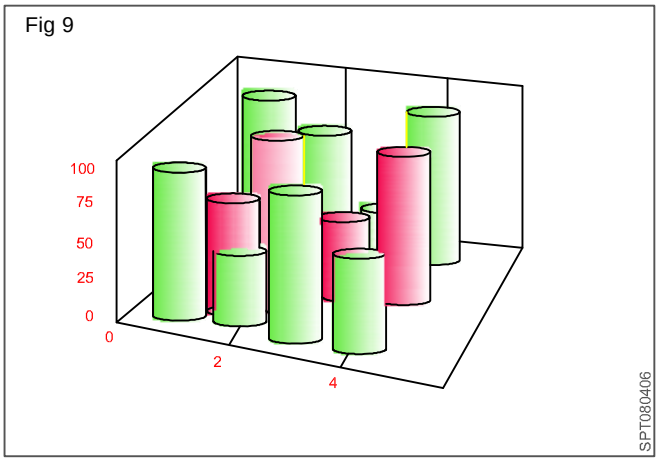
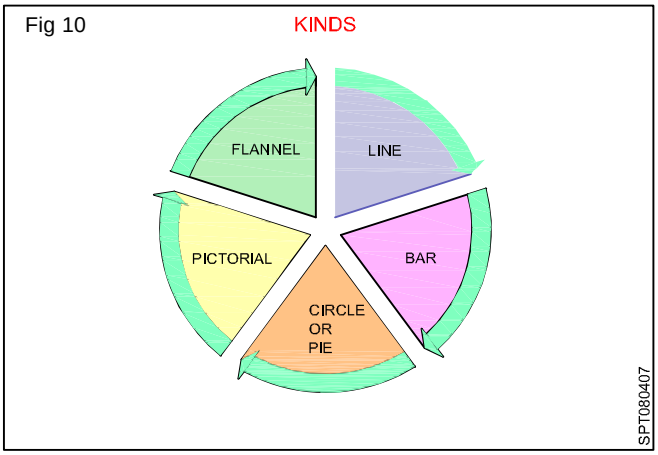


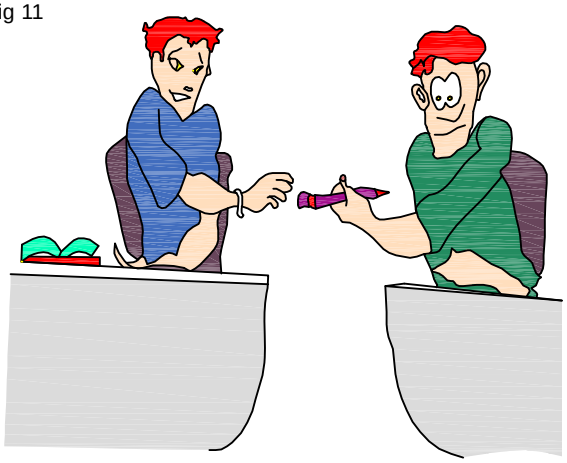
Fig 10



Cartoons (Fig 11, 12, 13, 14 & 15)

- A cartoon is an interpretive picture, usually a drawing, intended to convey a message or point of view about things, events or situation; may make free use of exaggeration and symbolism.
- Graphs
- Cartoons
- Projected aids

Fig 11



MAY I BORROW A PENCIL?

SPT080408

Fig 12

CARTOONS

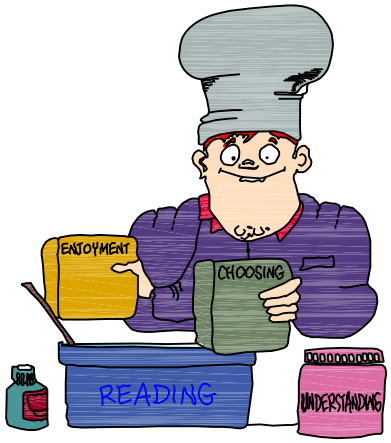


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Fig 13

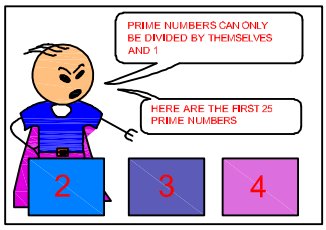

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Fig 14

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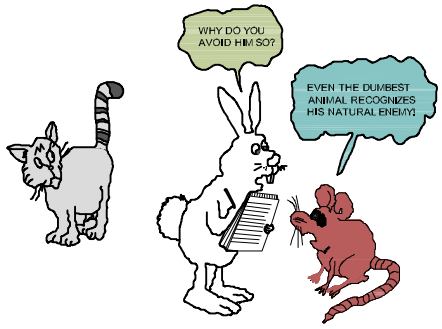
Fig 15



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Projected aids

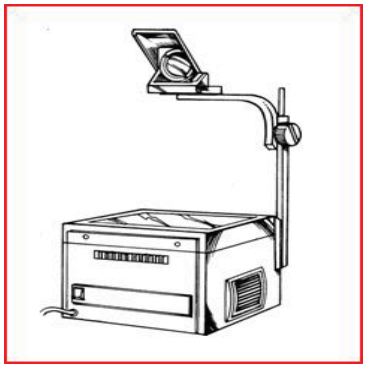
1 Film strip projector

- The projector is light, portable simple to use and easy to repair.
- It can be setup in a short time.
- The film strip frame can be stopped at any point for discussion.
- As they are manually operated it can be moved forward or backward
- Learners can be trained to operate it as instructor is conducting the class.

2 Over head projector (Fig 16)

- It is a method of projection for projecting transparencies.
- Overhead projectors are the very fore - front of the visual aid in class room teaching.
- The product is very simple in design and easy to operate
- The very important aspect of the over head projector is large bright illuminated picture/image.
- It provides a focal point for concentration compelling attention of learners.

Fig 16

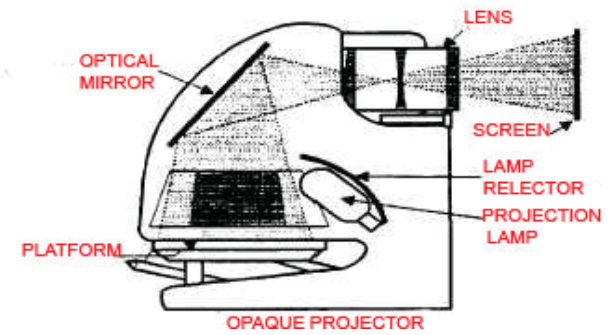


3 Opaque projector (Fig 17)

- Opaque projector is valuable because of its abundance of material available

- Magazine or book illustrations snap shots or news papers clipping may shown by opaque projector
- It requires a completely darkened room for its efficient operation.

Fig 17



Slide projector

- Projector of 50 mm x 50 mm slides are more convenient to use.
- It can be hold are slide at a time.
- It can also hold series of slides in sequence with a circular disc or rectangular rack.
- This device is quick and easy to operation
- Lesson can be presented interrupted.

Multimedia projector

- A multimedia projector is also called as video projector.
- It is a full projector with high resolution.
- Capable of projecting text, images, video, audio contents.
- The projector has input provision to accept signals from CD/DVD player, VCR, Digital camera and also from flash memory storage devices.
- Multimedia projectors are best suitable for class room teaching and training purpose.
- This is portable, can be operated on table top or as a celing-mounted arrangement for projection.
- This is operated using a remote control.

Audio aids

CD/DVD/USB player these are the state-of-the-art technology devices used for playing audio information as well as video contents used as teaching aid.

Radio

Radio and recording enable to bring full range of sound in all its variations. With its proper utilizations with media could be impressive and realistic.

Characteristics of radio and recording

- Immediacy
- Emotional impact
- Authenticity
- Conquest of time and space
- One way communication
- Audition

Use of radio

- Develop skills in listening
- To provide interest and varied sources of new knowledge
- Helps to inform the public about any informations
- To call attention for social problems
- Develops critical thinking

Principles and procedure for effective utilization of radio

- Preparation of the instructor
- Develop student readiness
- Listening to program
- Discussion and application
- Follow up

Limitations

- No concentrated attention
- One way communication
- Adjustment
- No reusability
- No pre-hearing and reusability
- Administrative problems

Educational recording

Teacher should listen to the records from various sources and select those most useful for the subjects and the topic they are going to teach. The use of recorded piece has a great value in language learning.

Types of recording

- Disc recording
- Tape recording
- Digital recording

Use of recording

- To mend speech defects in ones own language
- To teach good pronunciation in a foreign language
- For co-curricular activities in the institute

Type of teaching aid and uses	16mm sound motion picture films	Filmstrips	Slides	Flat pictures and tack board	Posters and Charts	Maps	Chalkboard	Filed Trips	Radio	Recordings and transcriptions	Language labs and tape recorders	Models and specimens	Television and Kinescopes	Teaching Machines
Visual Visual re-creates situations involving motion which occur anywhere	x							x				x	x	x
Visually re-creates the past	x	x	x	x	x		x					x	x	x
Visualizes theoretical ideas and microscopic life	x	x	x	x	x		x					x	x	x
Visualizes with natural color	x	x	x	x	x			x				x	x	x
Visualizes natural dimensions (three – dimensional)	x	x	x	x			x	x				x	x	
Audio Re-creates characteristics or environmental sounds	x	x[a]						x	x	x	x		x	x
Re-creates events through dramatization	x	x[a]							x		x		x	x
Utilization Sequence fixed	x	x											x	
Flexible organization permits rearrangement			x	x	x	x	x	x		x	x	x		x
Permits restudy	x	x	x	x	x	x	x	x		x	x	x	x	x
Permits leisurely examinations, discussion, etc.		x	x	x	x	x	x	x		x	x	x		x
Control of time and place of use	x	x	x	x	x	x	x	x		x	x	x	x	x
Can usually be produced locally	x	x	x	x	x	x	x	x	x	x	x	x	x	

* Sound filmstrips only

* Models in which slides, tapes, filmstrips, motion-picture films, etc. are used.

Advantages of recording

- It eliminates the time adjustment problems of radio
- Played according to desire and teaching need
- Recording offer a wide range of helpful material
- The institution can have their own recording

Tape recording

Tape recording are not easily damaged and can be replayed many more times.

Uses

- It enables one to listen and hear recording previously made.
- Provides for the pupil to hear their voice and events which occur in their own school
- Language learning is facilitated by use of tapes
- Class can tape their own singing or discussion programmer and listen into then in order in order to improve them later.

The sound film

A motion picture can be very valuable in the training programme especially where motion such as that found in any operation. If properly used, they can increase learning save time and provide desirable variety to the training programme.

Purpose of films

- To motivate the class
- To show an industrial process, material method of performing an operation or manufacturing.
- To show how skills of the trade are developed
- To explain scientific principles
- To introduce variety in teaching
- To bring distant and past things to the class - room
- To supplement the training programme

Sizes : 8 mm, 16 mm, 35 mm, 70 mm films are used for class room. A reel of film, if are in used for class - room is generally 400 ft in length and runs for about 10 to 12 minutes, with 24 frames per second.

When a sound film has to be used in the class - room the following steps should be followed:

a Selection

b Preview

c Discussion

d View

e Review

f Questioning

g Evaluating

1 **Selection :** Great care must be taken in the selection of a training film if it is to be effective and fit for the lesson. Try to maintain a list of films available for your particular subject, so that you can choose the proper film for the required topic.

2 **Preview :** Preview the film by showing it or viewing if for yourself. Make notes on its contents with following questions in mind.

   a Does the film content meet the objective of the lesson?

   b Which points need re emphasis or clarification?

Preview is necessary for following reasons:

- To know sequence of presentation
- To determine time required for show
- To note important points that trainees should look for
- To observe controversial points that need further clarification
- To see whether the film is pertinent to the lesson
- To frame questions on the matter shown in the film
- To determine the language used in the show

3 **Discussion :** The teacher leads a discussion on the film. The student should be informed about the title of the film salient or important points in the film, which the students should make special note, of a and what the students should expect of the film. Clear any doubts, give a short introduction. In the mean time, arrangement of the screen, projector and seating should be done.

4 **View :** "Show" the film to the students. Make sure that the screening sound etc. is free from defects. Remain with the students during the screening, as the presence of the teacher creates more interest. Help the students to see the film and learn.

5 **Review :** After the show is over, have a discussion on the material shown. List the important steps of procedure. Revise them, solve difficulties, if any. Let students discuss salient point amongst themselves.

6 **Questions :** Ask a few oral question to find how far the students have understood questions should be brief and specific. They should provide a ready summary of the film just seen. They should be helpful in clearing doubts.

7 **Evaluation :** To find how much the film show has been effective what the students have learnt by oral questions, and if required by a written or performance test.

To make the learning more perfect and permanent show the film once more, immediately after the review and questioning.

Remember any aid that is used out of step with the presentation of material tends to lose its effectiveness. Film shown as and when the film or auditorium is available are almost useless in terms of training objectives

Audio - visual aids

Educational televisions

Television has invaded INDIA in a big way: it is the most unique and dramatic of all media war devised by men for communications. It is complex of all the instructional materials that have been developed and used through the years.

Definitions

Television is the electronic means by which sound and light energy are transmitted from one place to another. It is the electronic black board of the future which is brought back to life.

Types

- Commercial stations
- Educational stations
- Instructional TV
- CD/DVDs

Advantages

- It combines sight and sound together
- Offers uniformity of communications
- Directly show the correct happenings and live shows
- Easy and convenient to handle
- Helps to update the knowledge

Role of teacher in educational television

- Planning and preparation
- Presentation
- Production
- Utilization
- Evaluation

Limitations

- One way communication
- Financial problem

Video tape recorder/DVD/USB players

Video is an electronic motion picture from CD/DVD or flash memory card or magnetic tape. This is actually video CD/DVD playing device with provision for playing from flash memory cards.

Advantages

- Operation is very simple
- No dark room facilities are required
- It captures attention and arouses interest
- It can bring away far away experiences
- It can impact emotional experiences
- Helps in developing social and moral values
- Enhance the rate of learning and retention

Limitations

- Costly to buy a TV and video
- It is expensive
- One way to communicate
- No personal contact with the teacher
- Encourages passive form of learning

Mobile learning

Objectives: At the end of this lesson you shall be able to
- **state the mobile technique is learning purpose**
- **explain the value of mobile learning.**

Mobile Technology

- Internet and Wi Fi
- Touch screen
- Games and quizzes
- Mobile applications
- Any time & anywhere

The value of mobile learning

- It is important to bring new technology into the classroom.
- Devices used are more lightweight than books and PCs.
- Mobile learning can be used to diversify the types of learning, activities students (or a blended learning approach).

- Mobile learning supports the learning process rather than being integral to it.
- Mobile learning can be a useful add-on tool for students with special needs. However, for SMS and MMS this might be dependent on the students specific disabilities or difficulties involved.
- Mobile learning can be used as a 'hook' to reengage disaffected youth.

Benefits

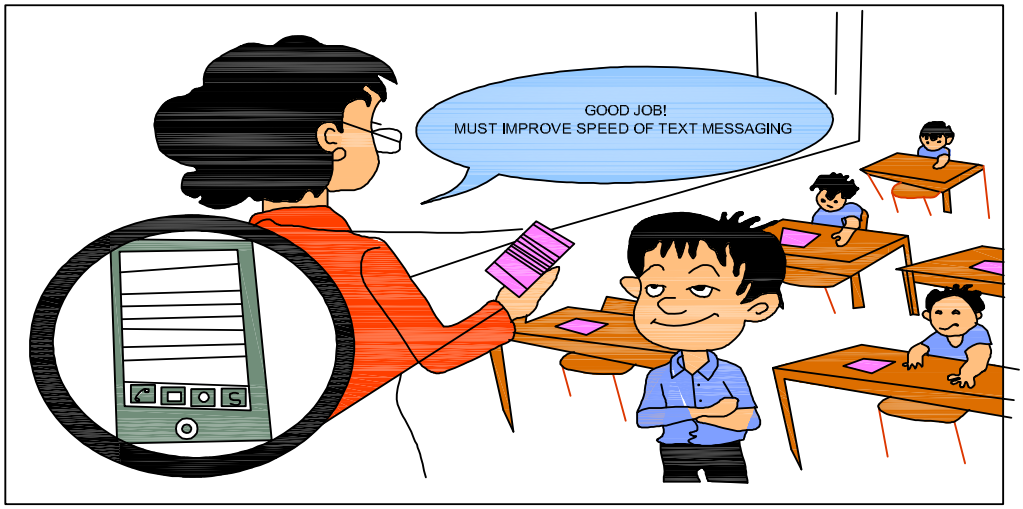
- Relatively inexpensive opportunities, as the cost of mobile devices are significantly less than PCs and laptops
- Multimedia content delivery and creation options
- Continuous and situated learning support
- Decrease in training costs
- Potentially a more rewarding learning experience

Technical challenges include

- Connectivity and battery life
- Screen size and key size
- Meeting required bandwidth for nonstop / fast streaming
- Number of life/asset formats supported by a specific device
- Content security or copyright issue from authoring group.
- Multiple standards, multiple screen sizes, multiple operating systems.
- Limited memory
- Risk of sudden obsolescence

Social and educational challenges include

- Accessibility and cost barriers for end users
- How to assess learning outside the classroom
- Content's security or pirating issues
- Frequent changes in device models/technologies/ functionality etc
- Developing an appropriate theory of learning for the mobile age.
- Design of technology to support a lifetime of learning
- No restriction on learning timetable
- Personal and private information and content
- No demographic boundary
- Disruption of students personal and academic lives
- Access to and use of the technology in developing countries
- Risk for distraction



Integration of aids in teaching

Objectives: At the end of this lesson you shall be able to
- **state the learning objectives**
- **explain type of learning structures.**

Integration of aids in teaching

For integration of aids in teaching, one must have clear concept or idea of different learning objectives and types of learning structures. An efficient trainer must take into account these aspects while integrating aids in teaching. These aspects in short, are therefore dealt herewith.

Cognitive objectives are concerned with information and knowledge, as such, realizing cognitive objectives in basic activity of most educational and training programmes.

Affective objectives on the other hand, emphasizes attitudes and values, feelings and emotions accordingly they are proper concern of education.

Psychomotor objectives involve muscular and motor skills or manipulation of material or objects, or some activity which requires neuromuscular coordination. Realising psychomotor objectives is, of course, the primary concern of a good deal of industrial vocational training.

Types of learning structures

Every task, by definition, must posses a unique structure or organization. However, five basic classes of learning structure are recognizable as being useful and meaningful to the trainer and leaner.

- Signal structure or stimulus response structure
- Chain structures
- Multiple discrimination structures
- Concept structures
- Principle structures

These five learning structures are defined in Fig 4, where examples of each are also given.

Learning structure	Definition	Examples	Pre-requisites
Signal	A signal involves a specific response to a secific stimulus	Learning definition in science. Warning light in a car dash-board.	-
Chain	A chain involves a fixed sequence of verbal or motor responses.	Carrying out checks in a car. Setting up a lathe or tying a shoe lace.	Each of the links or signals making up the chain must already have been acquired by the trainee.
Multiple discrimination	A multiple discrimination involves distinguishing one category of phenomena from another.	Distinguishing between longitude and latitude. Distinguishing between different wave forms on an oscilloscope.	Each of the chain or signals making up the set to be discriminated between must have already been acquired by the trainee.
Concept	A concept involves making a generalisation about a whole class of related phenomena.	Classifying or making generalisation about objects or events eg. resistance, magnetism, leadership and morale.	Each of the Chain or signals making up the class or set to be generalised about must have already been acquired by the trainee.
Principle	A principle involves a chain of concepts.	Fundamental truths or laws eg. Joules law, theory of conservation of energy.	Each of the concepts making up the principles must have already been acquired by the trainees.

Model Questions

Theory 8.4

12 What is the percentage of remember when we hear

A 20% B 30%

C 50% D 90%

13 What is the percentage of remember when me see & hear

A 20% B 30%

C 50% D 90%

14 What is the name of the term which is useful way to present and do play information or instructions used an educational institution

A Chart B Flash card

C Paster D Flannel board

15 What is the name that it is a collection of large number of pages bound together at the top such away that the pages can be easily turned and lie flat also it is used when other media & like over head and slides are available?

A Chart B Flash card

C Flannel board D Flip chart

16 What is the name that it is a effective tool for comparison and contrast?

A Chart B Flip charts

C Graphs D Cartoon

Role of various display board in instruction

Objective: At the end of this lesson you shall be able to
- **explain various types of display board.**

Introduction

A **display board** is a board - shaped material that is rigid and strong enough to stand on its own, and generally used paper or other materials affixed to it. Display board may also be referred to as poster board. Along with quad charts, display boards were an early form of fast communication developed by the National Weather Service of the United States Department of Commerce's National Oceanic and Atmospheric Administration.

Types of display boards:

- Folded display boards
- Tablet interactive display board
- Bulletin board

Folded display boards

Traditional tri-fold display boards are single sheet corrugated boards divided into three panels by score marks. Typically, the two outside panels are half the width of the center panel. Generally placed on a table, they are more stable and able to stand while still giving a theatre like view. Header boards can be added to the top display board and an easel stand can be attached to the back.

Outside institute, display boards are used for business trade shows, marketing, genealogy, life celebrations, arts and crafts, and memorials.

Science fair display boards are required to follow published guidelines. Board contents include Project Title, Abstract, Question, Hypothesis, Background, Research, Materials, Procedure, Results, Conclusion and Future Directions. Such display boards usually contain images and figures in addition to text.

Tablet interactive display board

An interactive display board may be made by attaching an electronic multimedia device such as a tablet to a display board. Methods for attaching tablets to display boards include cutting a window into a display board and fixing a pocket behind the window to insert and hold the tablet. Psyching pins into the face of a display board with the tablet resting on the pins, attaching a lanyard to the tablet in order to hang it on the display board, or using dual sided adhesive tape to attach the tablet to the display board. Projex Boards manufactures a display board for tablets, with a pocket, easel and header board. The purpose of tablet display boards is to hold the tablet at eye level on the display board to facilitate better communication between audience and presenter. Some tablet interactive display boards have apertures for electrical cords in the form of openings at the bottom of the display board.

Bulletin board : It is also called as pin board, notice board. The surface of the board is intended for the pasting of public messages.

Bulletin boards are used to display more or less on a semi permanent basis in a prominent place, materials for supplementing learning experiences outside the class hours. This can incidentally be brought to the classroom also.

Bulletin boards are particularly prevalent at universities. They are used by many sports groups and extracurricular groups and anything from local shops to official notices. Dormitory corridors, well trafficked hallways, lobbies, and freestanding kiosks often have cork boards attached to facilitate the posting of notices. At some universities, lampposts, bollards, trees, and walls often become impromptu posting sites in areas where official boards are sparse in number.

Internet forums are a replacement for traditional bulletin boards. Online bulletin boards are sometimes referred to as message boards. The terms bulletin boards, message board and even internet forum are interchangeable, although often one bulletin board or message board can contain a number of internet forums or discussion groups. An online board can serve the same purpose as a physical bulletin board.

Magnet boards, or magnetic bulletin boards, are a popular substitute for cork boards because they lack the problem of board deterioration from the insertion and removal of pins over time.

The following items can be displayed:

- Hand tools (may be actual or sketches)
- Sample materials or materials to represent the original.
- Circuits drawn on cardboard, or actual circuits.
- Literature available, or new arrivals.

- Cut outs from news papers/bulletin, or other information material.
- Process layout of various stages in the preparation of a job.

The display board can be used with advantage by asking the students to display any theme, concept or jobs which they have prepared, and provides direct experience in the learning process. This will give a competitive spirit among the different learners.

Materials

Bulletin boards are made of wood, soft board, or similar material. It should be soft enough to allow pins and tacks to be easily fixed. Usually the base board is provided with a frame, painted and hung at a convenient place. Sizes must be convenient as to be portable, to facilitate easy handing. Other materials required are:

Colour paper, Scissors, Gum or paste, Brushes, rubber cement or a solution of petrol or spirit and rubber, pins and tacks, letters, cut outs, pictures of various sizes, colour cloth or paper of attractive shades.

The bulletin board

Advantages	Disadvantages
1 Possible to make available to the learners, those materials for which there is only one copy.	1 Preparation consumes more time
2 It stimulates interest.	2 Visuals are likely to be lost.
3 It saves time.	3 Not usually fit for discussion sessions.
4 It encourages participation among learners outside the classroom.	4 Learners participation sometimes difficult or impossible inside the classroom.
5 It provides review and recapitulation.	5 Pre-prepared presentation, tends to reduce versatility
6 It helps to visually communicate ideas better.	6 Chances of distraction are there.

Model Questions

Theory 8.5

17 What is the name of the board which is single corrugated sheet divided in to the parts by score marks?

A Bulletain board

B Folded display board

C Tablet interactive board

D Flannel board

18 What is the name of the board which is popular and substiture is substitute is core board?

A Bulletain board

B Folded display board

C Flannel board

D Magnetic board

UNIT - IX

COMPUTER AIDED TEACHING

Learning Outcomes to be achieved from this unit:

- **Make an effective presentation using power point and other IT tools.**

Theory 9.1

I Multiple Choice Question items

Choose the correct answer:

1 Testing hypothesis and construction objects provided by

A Computer Games

B PowerPoint

C Images

D Simulations

2 Without the following, CAL is just a question bank

A Multimedia

B Lectures

C Assessments

D Study Material

Theory 9.2

3 Which one is provides the ability to equip your presentations with different types of media including images, sounds and Animation?

A PowerPoint

B Paint

C Paint 3D

D Graphics

4 Which one of the following is one of the main advantage of the PowerPoint presentation ?

A Attractive Background effects

B Increasing visual impact

C Increasing concentration

D Clear sound effects

Theory 9.3

5 What is the full form of LCD ?

A Liquid Crystal Display

B Light Crystal Display

C Liquid Crystal Diode

D Light Crystal Diode

6 Who was invented LCD projector:

A John Smith

B David Fernandez

C Gene Dolgoff

D Peter stephen

7 Which one is produces digital images that can be stored in a computer and displayed on screen?

A LCD projector

B Digital Camera

C Analog Camera

D Scanner

Theory 9.4

8 In which Technology work with Electronic white board(smart board)?

A Electromagnetic Technology

B Nano Technology

C Bio Technology

D Magnetic Tape Technology

9 Electronic board requires

A Computer only

B Computer and projector

C Projector only

D Display unit only

Theory 9.5

10 DARPA Stands for

A Defense Automobile Research Projects Agency

B Defense Automobile Research Programming Agency

C Defense Advanced Research Programming Agency

D Defense Advanced Research Projects Agency

11 Which of the following is a global system of interconnected computer Networks?

A Internet

B Intranet

C WorldWide Web

D TCP/IP

Importance of computer aided learning and teaching

Objectives: At the end of this lesson you shall be able to
- **describe computer-aided learning**
- **list the advantages of CAL.**

Computer-aided learning

Historically, it was in the early fifties during the last century that human beings used any kind of electronic device to perform a mathematical calculation. As soon as this was realized a series of developments took place and soon the computer came into being. People realized the immense potential computers had and started to use it in almost every field. Researchers openly stated that the use of computer for educational purpose would change the face of education in a very short span of time. Computer had the potential to stimulate and support various educational goals. The crucial question at that time and even now is that which goal/s should be selected? It was very important to select the goals appropriately as the choices made would have an immense effect on the children's minds, their learning styles and on the education process overall. The educational goals that could be achieved using computers 20 years back were limited due to technological barriers. With an exponential growth in technological breakthroughs and growing experience in using these computers for education the statements made during the last quarter of the 19th century makes a lot of sense now. Technology is no more a barrier today and it is up to the academicians to use it appropriately to meet the desired educational goals. Today a number of CAL programs available on the market.

Computer in Education

Game-based learning

Generally, games satisfy the basic requirements of learning environments identified by Norman (1993) and can provide an engaging environment for learning. Games should provide possibilities for reflectively exploring phenomena, testing hypotheses and constructing objects.

Computer simulations

Grimes et al studied the effects of a textbook-based software package in two classes of the Introductory Macroeconomics course. Their results indicate no statistically significant difference in learning between the experimental (software users) and control (non-users) groups. Finally, Grimes and Wiley conducted an experiment using a textbook-based simulation package in the Introductory Macroeconomics course. Their results indicate a statistically significant difference in overall attitude and performance between students who did and did not use the simulation software.

Animations

One particularly promising capability of computer based learning is the ability to integrate animation as part of instruction. Authoring application programs have made animation readily accessible to any educator who has the patience to learn how to use the application. Some other forms of Computer based instruction include Virtual Seminars/ Video conferencing, Drill and Practice and Problem Solving.

In its infancy CAL was used as a knowledge bank of questions and the students could self-assess themselves. Apart from this other computer related activities were not really adding to the 'learning' process of the students. With the advent of multimedia the role of CAL was extended and it was used to display simulations and animations to the students which were otherwise not possible for the students too see in real-time. This was seen as one of the most important reason to include computers in the classroom lecture as far as the teachers were concerned.

Providing study material in computer format can improve knowledge on the subject. Ideally the role of CAL in education lies in the hands of the academicians. The role that these Educators give to CAL will determine the limits of its achievement.

Some of the main pedagogical and economical forces that have driven the push for universities and schools to adopt and incorporate computer aided learning include: Greater information access – The World Wide Web has made it possible for people to access primary sources of information on demand. Mastery of this tool has become essential in order to gain access to an ever-growing body of recent and up-to-date knowledge available electronically.

Greater Communication facilities – Interaction between academic staff, colleagues and students can be structured and managed through electronic communications to provide greater access and flexibility.

The quality of teaching – New technologies have gained much attention from academic staff as they perceive, their use, will lessen their problems of high workloads, increased student to teacher ratio and use of inexperienced staff to teach. There is ample evidence, that well designed multimedia software can be more effective than traditional classroom methods, where students are able to interact with the software and learn at their own pace. Integrated effectively into the classroom environment, ICTs can facilitate higher order thinking skills and develop new ways of learning.

Asynchronous learning – This initiative has enabled institutions to cater for a variety of students by removing the barriers of time and distance. Students who are normally, geographically disadvantaged have access to a variety of resources not usually at their disposal.

Pedagogical Improvement and staff renewal – Teaching staff are able to preset information using a variety of tools in order to better relate to the content to the concrete realities of a given field of study. Innovative hands-on learning experiences are also made possible for students through computer simulation software.

Computer Education

Advantages of CAL

One of the main advantages of Computer aided learning concerns the time, the place and the pace with which one can learn. A few more advantages of CAL identified by the researchers and authors are listed below:

- **Provision of alternative teaching techniques**. The computer can utilize a number of teaching methods and materials that may not be viable to use in a traditional setting. For example, a graphics display terminal using animated characters on a screen is a stimulating tool.
- **Individualized instruction**. Learning is significantly more effective and efficient when instruction can be tailored to the unique needs of each learner. CAL enables students to go through specific lessons at their own pace.
- **Ability to conduct simulations**. In a National survey on the use of CAL in Dutch institutions of higher education found, that the most popular form of CAL was simulation. One of the reasons that simulation is so popular, could be that it is the only type of CAL in which the program adds something to the curriculum that a teacher cannot offer.
- **Providing instructions on demand**. The computer can provide virtually unlimited accessibility to educational material. The computer's availability is not constrained by the same factors that place a limit on a teacher's time. Whereas a teacher is available only during specific hours, in a specific place, and usually for group lessons, a computer is available for use at all times and on an individual basis and in many places.
- **Flexibility** is another reported strength of CAL it was easier to work in collaborative groups in an online course without rearranging everyone's schedule as one might do in a traditional face-to-face course.

Power Point presentations

Objectives: At the end of this lesson you shall be able to
- **explain the usage of power point as a teaching aid.**

Using Power Point as teaching aid

As technology enters the classroom more and more each year, there are always new innovations being brought into the fold that can help teachers to get their points across better, and help students learn more efficiently. One such tool that has been utilized in the classroom for some time now and continues to be used heavily is the Microsoft PowerPoint program.

This program is one that enables teachers and students alike to prepare presentations. When used effectively, PowerPoint can really enhance teacher presentations and the overall comprehension of students. It is a program that allows teachers to present their lessons in a more dynamic way than simply lecturing and writing on the blackboard.

Power Point has become very popular because it's easy to learn and widely available. It provides the ability to equip your presentations with different types of media - including images, sounds, animations, and much more. This enhances the students' abilities to retain what they're being taught, especially those who are visual learners. Teachers can focus on the class and interacting with the students instead of writing on a board, because the text and the entire presentation is already there in the form of a Power Point file.

Power Point is not just for the teachers though, another way to use Power Point in an educational setting is to have the students create their own presentations. This is a great way to teach them how to use visual aids while working on their presentation and public speaking abilities.

However, it is also important to note that when used incorrectly, PowerPoint presentations can actually be less effective than regular, old-fashioned teaching methods. Mistakes can be made not only in the way that the presentation is made, but in the way it is presented as well. One common mistake teachers make is that they simply reading the slides to students word-for-word, which is terribly boring to watch, and won't keep their attention or enhance the learning experience in any way. Not using Power Point effectively can render your presentations PowerPoint-less.

Advantages

Potential benefits of using presentation graphics include:

- Increasing visual impact
- Improving audience focus
- Providing annotations and highlights
- Analyzing and synthesizing complexities
- Enriching curriculum with interdisciplinarity
- Increasing spontaneity and interactivity
- Increasing wonder

Challenges

Although there are many potential benefits to Power Point, there are several issues that could create problems or disengagement:

- **Teacher-centered :** Students often respond better when instructors have designed sessions for greater classroom interaction, such as the use of student response clickers, designing Power Point to facilitate case studies, or use the slides as a replacement for paper worksheets.

- **Lack of feedback :** Power Point-based lectures tell you nothing about student learning. Design them to include opportunities for feedback (not simply asking if there are questions, but more actively quizzing your students). This often takes the form of listing questions, not information, on the slide itself.
- **Student inactivity :** Slide shows do little to model how students should interact with the material on their own. Include student activities or demonstrations to overcome this, either before or after the slideshow presentation.
- **Potentially reductive :** Power Point was designed to promote simple persuasive arguments. Design for critical engagement, not just for exposure to a "point."
- Presentation graphics should be about learning, not about presentation.
- Power Point presentations should help students organize their notes, not just "be" the notes. This is a particular danger with students who grew up accustomed to receiving Power Point notes to study from. Some may require convincing notes should be taken beyond what is already on the slides.

Three Possible Approaches

This single presentation about the anatomy of the human eye has been rewritten in three different ways:

- **Text-heavy :** this version offers complete phrases and a comprehensive recording in words of the material. The text-heavy version can be used as the lecturer's speaking notes, and doubles as student notes that can be made available for download either before or after the lecture has taken place. If the information can be accessed elsewhere, such as a textbook, it may be preferable to avoid a text-heavy approach, which many students find disengaging during the delivery.
- **Some images :** this version sacrifices some of the completeness of the material to create space for accompanying images. The mixed approach appeals to more visual learners while keeping some lecture notes visible, though perhaps in a more abbreviated format. This is a common mode of delivery in large classes. However, there are still some challenges. There is enough material already present in text format that some students may feel obliged to write it all down in their own notes, thus paying less attention to the verbal lecture. Conversely, if the slides are available for download, some students may be able to eschew note-taking in class, yet be tempted to consider these fragmentary notes sufficient for studying for exams.
- **Image-heavy :** this version relies almost exclusively on images, with little text. The image-heavy approach signals to students that they will have to take their own notes, as these are plainly insufficient on their own for studying. However, lecturers often need more than visual clues to remind themselves how to propel the lecture forward, and separate notes may be required. One elegant solution is to use "Presenter View" on the speaker's screen (which displays the notes only to you) and project the slides without notes onto the larger screen visible to the audience.

Power Point for Case Studies

Elizabeth Rash (Nursing) provided this sample iterative case study (where parameters evolve over time) given to a midsize class. Students are required to come to class prepared having read online resources, the text, and a narrated slideshow presentation that accompanies each module. The classroom is problem-based (case-based) and interactive, where students are introduced to a young woman who ages as the semester progresses and confronts multiple health issues. Since the nurse practitioner students are being prepared to interact with patients, some slides require students to interview another classmate in a micro role-play.

Problem-based lectures frequently alternate between providing information and posing problems to the students, which alters the entire character of the presentation. Rather than explain and convey information, many slides ask questions that are intended to prompt critical thinking or discussion.

Power Point Interactions: Student Response "Clickers"

Classroom response systems can improve students' learning by engaging them actively in the learning process. Instructors can employ the systems to gather individual responses from students or to gather anonymous feedback. It is possible to use the technology to give quizzes and tests, to take attendance, and to quantify class participation. Some of the systems provide game formats that encourage debate and team competition. Reports are typically exported to Excel for upload to the instructor's grade book. Learn more about how to use this system in your own classes.

Power Point as Worksheet

Instructors who do not have sufficient photocopying opportunities in their departments may be less likely to use paper worksheets with their students, especially in large classes. Power Point offers the ability to approximate worksheets to illustrate processes or to provide "worked examples" that shows problem-solving step-by-step. One valuable technique is to first demonstrate a process or problem on one slide, then ask students to work on a similar problem revealed on the next slide, using their own paper rather than worksheets handed out.

Narrated Power Point Downloads

The Power Point software itself includes built-in functionality to record your audio commentary. In this fashion, instructors can literally deliver their entire lecture electronically, which can be especially useful in an online course. The resulting file is still a standard Power Point file, but when the slideshow is "played," the recorded instructor's voice narrates the action, and the slides advance on their own, turning whenever they had been advanced by the lecturer during the recording. Click here to see a sample.

It is also possible to use AuthorPoint Lite, a free software download, to take the narrated Power Point presentation and transform it all into a Flash video movie, which plays in any Web browser. Here is a sample. To create such a video, you must first record a narrated presentation, and then use AuthorPoint Lite to convert the file. Our tutorial explains the process.

Presenter View

Using this mode of Power Point, your slides are projected as usual on the big screen and fill the entire space, but the computer used by the lecturer displays the slides in preview mode, with the space for notes visible at the bottom of the screen. In this fashion, lecturers can have a set of notes separate from what is displayed to the students, which has the overall effect of increasing the engagement of the presentation.

- This example of "Life in Elizabethan England" shows how to structure a presentation with nothing but images on screen, using the Presenter View to hold the lecturer's notes.
- Microsoft's tutorial explains how to configure the Presenter View.

Best practices : Delivery

- **Avoid reading :** if your slides contain lengthy text, lecture "around" the material rather than reading it directly.
- **Dark screen :** an effective trick to focus attention on you and your words is to temporarily darken the screen, which can be accomplished by clicking the "B" button on the keyboard. Hitting "B" again will toggle the screen back to your presentation.
- **Navigate slides smoothly :** the left-mouse click advances to the next slide, but it's more cumbersome to right-click to move back one slide. The keyboard's arrow keys work more smoothly to go forward and backward in the presentation. Also, if you know the number of a particular slide, you can simply type that number, followed by the ENTER key, to jump directly to that slide.

Best Practices: Slideshow Construction

- Text size: text must be clearly readable from the back of the classroom. Too much text or too small a font will be difficult to read.
- Avoid too much text: one common suggestion is to adhere to the 6x6 rule (no more than six words per line, and no more than six lines per slide). The "Takahasi Method" goes so far as to recommend enormous text and nothing else on the slide, not even pictures, perhaps as little as just one word on each slide.
- Contrast: light text on dark backgrounds will strain the eyes. Minimize this contrast, and opt instead for dark text on light backgrounds. Combinations to avoid, in case of partial color blindness in the audience, include red-green, or blue-yellow.
- Transitions and animations should be used sparingly and consistently to avoid distractions.
- Template: do not change the template often. The basic format should be consistent and minimal.
- Use graphics and pictures to illustrate and enhance the message, not just for prettiness.

Other ideas for use on a Power Point presentation include:

- Change font
- Shapes
- Clip art
- Images
- Charts
- Tables
- Transitions
- Animations
- Animating text or chart

Create Power Point presentations

Objective: At the end of this lesson you shall be able to
- **create PowerPoint presentations.**

Creating a Power Point Slide

Step 1:

Open Microsoft Power Point.

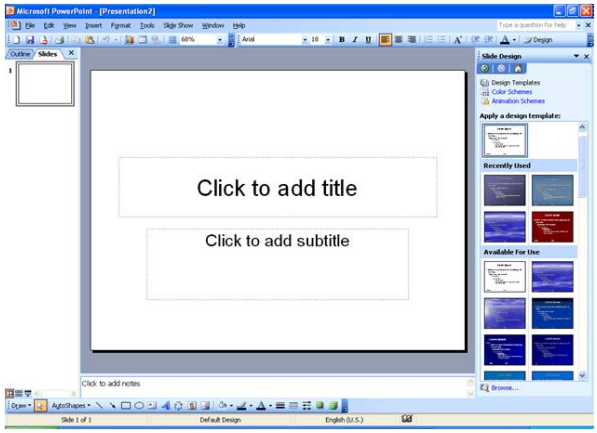
Step 2:

Go to File at the top of the screen and click New. A box that says "New Presentation" should appear on the right side of your screen.

Step 3:

In the "New Presentation" dialog box, click on "From Design Template." You may then scan through design templates and choose one that you like. (Fig 1)

Fig 1



Step 4: Slide Design

Select a design template by clicking on the template you like. You may choose a different color for your template by clicking on "Color Schemes" in the "New Presentation" dialog box.

Step 5: Slide Layout

Change the Slide Layout. You may change the slide layout (how information is presented in the slide) by going to the top of the screen and clicking on "Format" - "Slide Layout." A box will appear on the right side of your screen (where "New Presentation" appeared) labeled "Slide Layout." You may select a design by clicking on it.

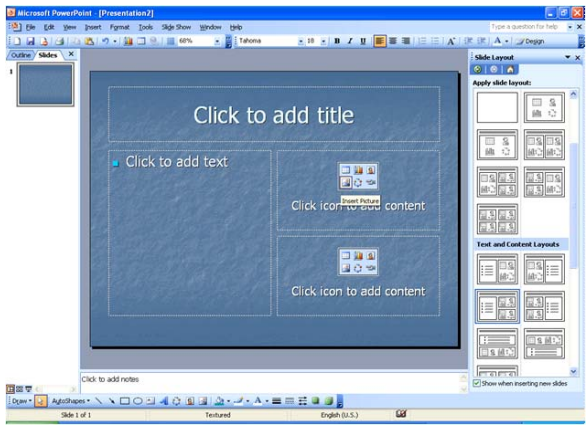
Step 6: Adding Text

Enter your text by clicking and then typing in the box titled "Click to Add Text" or "Click to Add Title."

Step 7: Adding Pictures

You may add pictures by clicking on the box that says "Click to add content." Inside that box, there will be a smaller box with six icons. Click on the icon that looks like a photograph of a mountain. A new window will open, allowing you to browse for a picture on your computer or a CD. Once you find your picture, click on it and then click "Insert." (Fig 2)

Fig 2



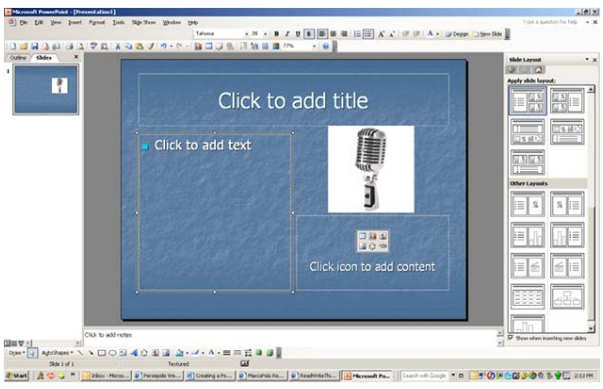
Step 8: Resizing Pictures

You may change the size of your picture by clicking on the picture. The picture will then have black lines around it with small bubbles or boxes in the corners. Place your mouse over the bubbles or boxes and click. Holding the mouse pointer down, drag the picture to the size you want.

Step 9: After creating slide, save it using ‘file’ - ‘save’ as ppt. To view presentation press “F5”.

Step 10: You're Done! Wasn't that easy? Now you can do it again to make more. (Fig 3)

Fig 3



Application and care of Digital camera & LCD Projector

Objectives: At the end of this lesson you shall be able to
- **define LCD Projector**
- **state the applications of LCD Projector**
- **define digital camera and its uses.**
- **brief the care and maintenance of LCD projector and digital camera.**

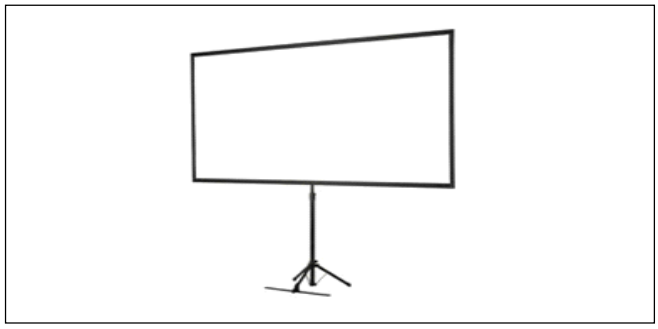
LCD Projector

LCD projector is a type of video projector for displaying video, images or computer data on a screen or other flat surface.

It is an advanced teaching aid used for effective presentation comparing to Slide Projector and Overhead Projector.

To display images, LCD (liquid- crystal display) projectors typically send light from a lamp through a prism that separates light to three poly-silicon panels- one each for the red, green and blue components of the video signal and projects on the screen.

LCD projector was invented in 1984 by American inventor Gene Dolgoff.



Application

An LCD projector connects to a computer, laptop or desktop, allowing the computer's screen to be viewed by the entire class.

LCD projector brings the world to the class. Show multimedia presentations, or downloaded videos, anything that can appear on your computer screen can be projected with an LCD projector.

Audio Visual Aids are used for communication purpose. In teaching- learning process AVA plays very important role. It is important to select aids which are appropriate to the method of teaching.

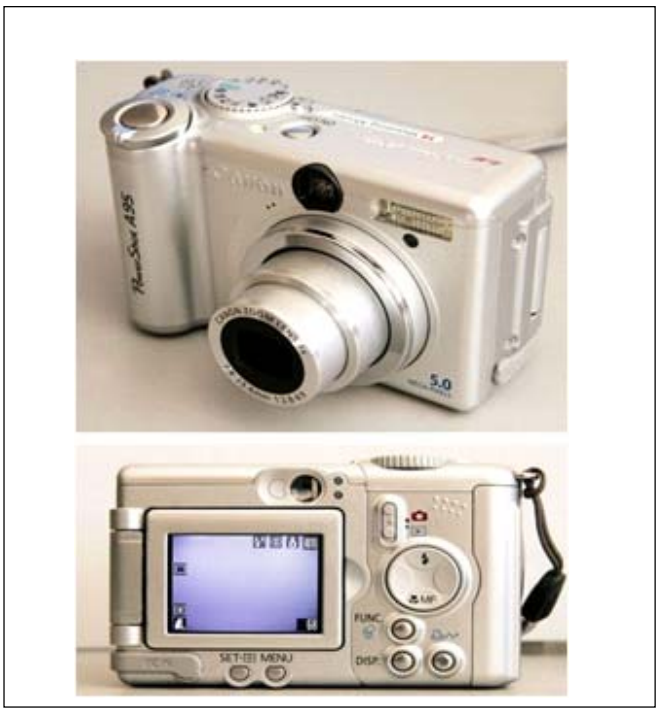
Audio aids communicate ideas through the ears to the mind. They may take the form of audio, music or tape recordings.

Visual aids communicate facts and ideas through the eyes to the mind and emotions. Visual aids include films, slides, videos, overhead projection, books, photographs, models and charts.

Digital Camera:

Is a camera which produces digital images that can be stored in a computer and displayed on screen.

A digital camera or digicam is a camera that encodes digital images and videos digitally and stores them for later reproduction.



LCD Projector Care & Maintenance

- Become familiar with the unit before your first presentation or event.
- To prolong lamp life, always allow your projector to cool completely before turning off or unplugging.
- Remember that excessive heat can greatly shorten your lamp life.
- Do not operate your projector in direct sunlight or near a heat source.
- Change filter, if applicable, as specified in your user manual.
- Never operate the unit without the air filter, if applicable. Doing so can draw dust into the optics of the projector, which can be projected onto your image.
- Avoid using your projector in a smoky environment. This can cause damage to the optics of the unit and can void your warranty.
- Store your projector in a cool, dry area. Save the shipping box for safe secure storage when not in use. If the need arises for you to ship your projector in the future, the original box and packing material is the safest way to pack your unit.
- If the projector is mounted to the ceiling, be sure that the area near the intake fan is kept clean and not in direct line of air or heat vents.
- For optimal image quality, always keep your lens clean. The safest way to clean your lens is with a lens cloth, which can be purchased at a camera store.

Care & Maintenance of Digital camera

- Avoid dirt and sand. Use care when cleaning dirt particles and sand from your digital camera. Do not use canned or pressurized air to clean the sand, as you might just drive the particles into the camera case. Budget priced camera cases, might not be sealed perfectly, making it easier for grit and sand to penetrate the case and cause damage. Gently blow out the grit and sand to avoid this problem. Use care when shooting photos on a windy day at the beach, too, where sand can blow with excessive force. Avoid opening the battery compartment on such days.
- Avoid liquids. Try to keep all liquids away from the camera, unless you have a model with a waterproof case. Cameras are like any piece of electronics, and they can be damaged by excessive water.
- Avoid touching the lens and LCD. Oils from your skin can smudge the lens and LCD, eventually causing permanent damage. Clean the lens and LCD with a microfiber cloth as soon as possible, anytime you see a smudge from your fingertips.
- The lens and sun don't mix. Do not point your camera's lens directly at the sun for any length of time, especially with a DSLR camera. Sunlight focused through the lens of the camera could damage the image sensor or even start a fire inside the camera.
- Use cleaning liquids with care. Avoid using an excessive amount of cleaning liquid with your camera. In fact, other than stubborn smudges, you should be able to clean the camera with a dry microfiber cloth. If a liquid is needed, place a few drops of the liquid on the cloth, rather than directly on the camera. Water can be used in place of cleaning liquid as well.
- Vacuum clean the bag. Dirt and sand inside your camera bag could damage your camera, so be sure to vacuum the bag regularly to keep it clean and protect your camera.
- Watch the temperature. Although some cameras are designed to survive harsh temperatures, most cameras are not. Do not leave your camera in a sunny vehicle, where temperatures quickly can exceed 100 degrees Fahrenheit. Avoid leaving the camera in direct sunlight, which can damage the plastic. Finally, avoid extreme cold, too, which could damage the LCD.
- Use neck straps and wrist loops. Admittedly, this is more of a "preventative" maintenance tip, but be sure to use neck straps and wrist loops with your camera whenever possible as you're shooting photos outside. If you slip while hiking, or if you lose the grip on your camera near the pool, the straps can save your camera from a potentially disastrous fall. Better be safe than feeling sorry. (If you do drop the camera, click on the link to try some troubleshooting tips.)
- Store camera properly. If you're not going to use your camera for a couple of months, you'll want to store it in a low humidity area and out of direct sunlight. Additionally, try storing the camera without the battery inserted, as this will reduce the possibility of suffering corrosion.

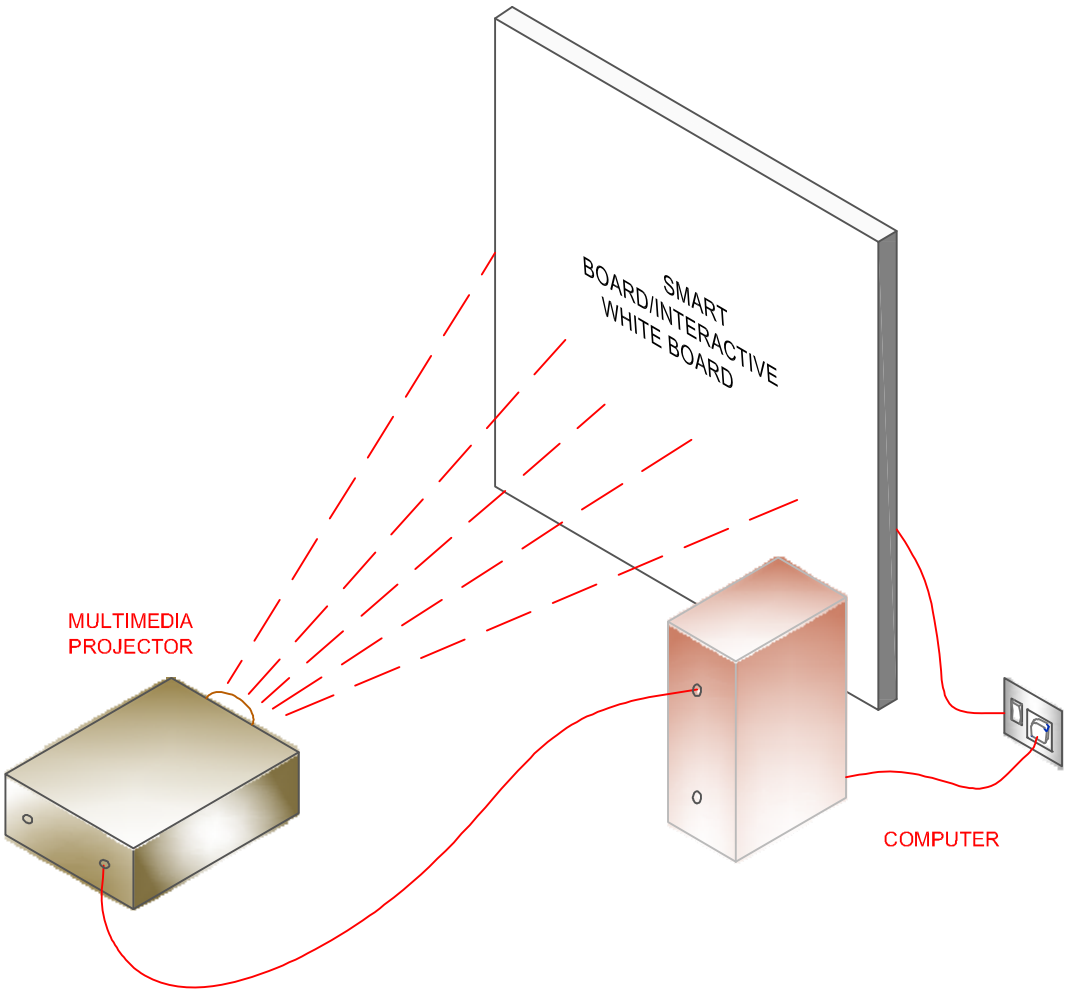
Different features and application of Smart/interactive Board

Objectives: At the end of this lesson you shall be able to
- **explain what is smart board and its features**
- **describe the uses of smart board in classroom.**

Technological developments have replaced almost all conventional gadgets into modern state-of-the-art sophisticated electronic systems. In this context, today the chalk board in classrooms are replaced with smart boards coming under projected visual aid category. Smart boards are electronic white boards working with electromagnetic technology. These boards are also called as Interactive board or interactive white board. These electronic boards requires a computer and a multimedia projector for its working as shown in Fig 1. The setup of interactive board is shown in Fig 2.

Fig 1

Fig 2



Features of the Interactive board

- These interactive boards are working with preparatory software, supplied by the manufacturer. The user installs this software into the computer.
- Interactive board is fixed on wall and multimedia projector is fitted and positioned correctly to fill the image within the boundary marked on the board.
- By USB cable the computer and Interactive board are interconnected for its functioning.
- This smart board is also working without wire connection to the computer i.e., by bluetooth connectivity.
- Rechargeable magnetic pen is used to generate any desired colour to select from the colour to select from the colour pellet and line thickness from tool bar.
- Mouse function is provided on the magnetic pen by checking them it serves as a mouse also.
- Simple calibration method enables the use of interactive board just by touching on the calibration mark displayed on the board using magnetic pen only at the opening time to synchronies the computer with interactive board.
- The original file used is not affected, but a separate file with the interactive activities done on the displayed image on the board is saved separately in its software.
- The smart board also can be used as a normal white board without the use of computer and multimedia projector.
- The software is run in one of three operational modes, Interactive mode, office mode (windows only), or whiteboard mode. Whiteboard mode, used without a video projector, allows you to capture and preserve notes, drawing, calculations - whatever you write on the whiteboard with an marker pen. Office mode makes it possible to interact directly with the native files of the Microsoft Office suite of products, PowerPoint, Word and Excel. Interactive Mode, the most feature-rich and robust of the operational modes, allows you to open and run applications while in Mouse Mode by using your electronic Pen to move the cursor on the projected image on the Whiteboard surface. In Annotation Mode, you use the pen to select Tools from the Toolbar.
- Annotations tools have been categorized as annotation tools, editing tools, page creation, page management tools, presentation tools, file management tools and miscellaneous tools. The online support help file describes all this tools in detail, and can be accessed from the device manager menu.

Distribution presentation files

- The presentation files you create can be printed for local distribution, or emailed to anyone, anywhere. Use the page sorter tool to review the presentation file. The pages in the presentation file can be sorted, moved, copied, and deleted using the page sorter tool. When the file pages have been arranged to your satisfaction, you can use the page sorter's print option to print it, you can export it to one of several file formats, or you can email it directly from page sorter.
- The native file format of saved presentation files has the GWB extension and can be viewed in windows with the GWB Interwrite Reader. This is an application that is part of the interactive board software suite and is installed when the software is installed on the windows operating system. Reader can be distributed freely with your presentation files. You can also save your presentation files in a PDF format, which can be read by Adobe's Acrobat Reader, or you can export your presentation files to a variety of graphics and HTML formats.
- A existing presentation file can be opened, its pages can be sorted, annotations can be added to the existing pages, and new pages can be added to the file. Your presentation will determine how each presentation file evolves. For example, you can prepare a presentation file of blank maps ahead of time for a geography lesson, Or, you can capture and annotate each of the monthly earnings spreadsheets as you review the past fiscal year during a budget meeting. Or, you can run a PowerPoint slide show in Office Mode (Windows only) and annotations can be added to each slide and saved in the native file.
- You can build your presentation file during your presentation, or you can pre-build it, including the screen captures, images, graphs and text pages you want to present. However you choose to do it, process is the same. To capture a screen or window, click on the Mouse Mode tool with your interactive Pen and arrange the desktop for capture. Select and Annotation.

Uses of Interactive board

- Using the best type of projected visual aid, the instructor can plan, prepare instructional materials like text information, diagrams video, animation etc in advance and stored into the computer for teaching in forth coming classes.
- Stored informations are directly opened by using the interactive magnetic pen on the smart board just by clicking the relevant icon from the tool bar provided on the board itself.

- The Instructor need not spend time and effort to draw diagrams, but simply select them and store in the computer. Just by simply selecting the file by the use of mouse buttons provided on the magnetic pen those diagrams can easily be selected and shown on the board in a matter of seconds effortlessly.
- The size of the diagrams shown on the board can be moved to any position over the board just by click and drag on it; the size can be increased or decreased very simply.
- The thickness of the line written by the magnetic pen can be easily changed by the relevant icon; colour of the line also can easily be chosen just by simple touch of the required colour on the colour pellet as shown in Fig 2.
- Geometrical shapes like circle, square, triangle etc can be easily drawn for mathematical functions just by clicking and dragging to any size on the board.
- On interactive mode instructor can draw lines, mark and write any thing on the opened file displayed on the board will be saved separately without any modifications in the original file.
- After completely writing on the board need of erase or clean the contents, but by opening another fresh page the class can be continued to any number of pages and saved.
- Any such saved pages can be easily opened for clarifying the doubts or summarising the main points visually to the learners.
- After completion of the class the whole information displayed on the board can be saved as a PDF file also to be issued to the participants.
- The interactive board is working without the USB connections also, i.e., in Bluetooth mode.
- The information also can be accessed through Bluetooth connectivity by the laptop from any corners of the classroom.
- With the interactive board the instructor is motivating and inspiring the learners for delivering information of his subject-sustaining their interest till the end with lively interaction.
- By the interactive board set up different trade instructors can make use of this facility suitably according to their time tables so that this resurce can be utilized effectively for teaching and training various trade groups of the Institution.
- Apart from teaching and training activities, the interactive board can be effectively utilized for organising seminars meetings and other official purposes also.
- The latest advancement in interactive board does not requires a rechargeable type of magnetic pen for its operation. It is designed to work with a ink exhausted marker pen (dummy marker pen) or even with a finger for full functionality right from the calibration step to save the presentation without ink stains.
- Overall, incorporating interactive boards to the classroom environment is likely to change the way teachers/trainers impart knowledge and skills at the same time simplify the learning process for learners. Learners will find it easy to engage with lessons and gain a better understanding of the overall lesson. It is an ideal tool for any classroom setting for effective teaching and development of learners skills.

Application of Internet in teaching and learning

Objectives: At the end of this lesson you shall be able to
- **define internet**
- **list the application of internet**
- **explain the applications of internet in teaching and learning.**

Definition

The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite (often called TCP/IP, although not all applications use TCP) to serve billions of users worldwide.

- It is a *network of networks* that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies.

History

The Internet was created in the United States by the "United States Department of Defense Advanced Research Projects Agency" (known as *DARPA*). It was first connected in October, 1969.[1] The World Wide Web was created at CERN in Switzerland in 1989 by a British (UK) man named Tim Berners-Lee.

Application of Internet

The Internet is used for many things, such as

- E-Mail
- Online Chatting
- File sharing and transferring
- Entertainment
- News group .use net
- Social networking
- Web pages
- Blogs
- Interesting web sites

Importance of Internet in Education

The Internet has introduced improvements in technology, communication and online entertainment, but it is also incredibly useful for education purposes as well. Teachers use the Internet to supplement their lessons, and a number of prestigious universities have opened up free online lectures and courses to everyone. It has even allowed retired teachers to read and educate children in poorer countries. Widespread use of the Internet has opened up a substantial amount of knowledge to a much broader range of people than ever before.

Enhanced Lessons

Teachers can make use of the Internet by giving students extra resources and material from the Internet, such as interactive lessons and educational games. Many college courses use a "hybrid" model where many lessons are done online, requiring fewer in-class meetings. This saves students from having to commute to campus with their heavy textbooks every day. Tests, homework, collaboration with students and research can all be done from any computer with Internet access. Even for non-hybrid classes, the Internet is used as an addition to normal studies.

Study and Research

The Internet contains a wealth of knowledge that is available instantly upon any search. Because of this, the Internet has superseded libraries as a source for information gathering and research. Many teachers will now ask students to visit specific websites to study from home, and online encyclopedias provide masses of knowledge on almost every topic imaginable. The variety of sources allows students to pursue subjects in much greater detail rather than being limited to whatever the teacher sends home.

Communication

It used to be that students that forgot work, missed a lecture or couldn't remember an assignment were out of luck until talking face to face with a teacher or a classmate. However, the Internet allows instantaneous connection to your classmates and teachers. Improving communication between students and teachers allows teachers to assist students without having to stay after class. It also allows for students to have greater efficiency when working on projects with their peers when everyone cannot attend or asking for clarification when something is unclear.

Accessibility

A number of universities, such as Harvard, Yale and Stanford, have opened up free courses on a variety of subjects that are accessible to anyone for free. These typically come in the form of lectures on video, but some also have notes attached. This means there is easy access to plenty of free lectures without emptying your bank account to pay tuition. The Internet also makes education accessible to impoverished communities. The "Granny Cloud," for example, made use of Skype as a number of volunteers, mostly retired teachers, read stories aloud over Skype to children in India to teach them how to read.

Explain the application of internet

Modern equipments like Television, Computer, and multimedia, Internet are used for effective presentation and fast and wide range of communication.

Many organizations, Industrial houses and Business enterprises, and many other areas of Government, non-Government and private sector have been using Internet for delivering education and training at a distance, with in the boundary of the organization, as also across borders. Its use involves an electronic mail system and access to library.

A learner anywhere from far away to the next-door neighbour can be taught virtually through the Internet. Besides a whole range of telecommunication media viz., computer conferencing, audio graphics, video conferencing are available for Distance education. Communication media like CD, DVD, and other computer based information are used in ICT.

Media can be synchronous and asynchronous. In an asynchronous medium like computer conferencing, both learner and tutor get time to think their respective responses and prepare messages to be put into their machine at their convenience for the conference.

One can read and re-read messages at one's convenience, rather than at a set time. The e-mailing facilities transmission and downloading of information, communication and interaction with the teacher and peers, and complete a course work or course of instruction.

While the Internet has not changed the expertise of the teachers and learners to teach and learn, it has definitely helped them to improve their skills and ways of operation. In face-to-face situations, its use has increased flexibility in delivery & interaction.

In open distance, flexible and multi channel learning, Internet has changed the concept of space & time and facilitated recognition of prior learning transfer of credits, and joint degree programmes through modernization, credit transfer, and accreditation.

The role of teacher has shifted from teaching to facilitating access to and comprehension of information and learning resources.

Virtual universities, which are operated through Internet and other telecommunication technologies replaces or compensate both the campus based as well as home based learning environment.

It uses multimedia, and other communications and information technologies including www, through its virtual university learning environment, for providing information, registration, payment of fees, distribution of learning materials, library services, lectures, seminars, submission & evaluation of assignments, taking exams, trainer-learner interaction, both synchronous and asynchronous communication, and conferring of degrees. Therefore audio visual aids are playing a vital role in the field of Information and Communication Technology.

UNIT - X

TEACHING PRACTICE

Learning Outcomes to be achieved from this unit:

- **Impart effective training as per best teaching and training practices.**

Presentation skills and Dale's cone experiences

Objectives: At the end of this lesson you shall be able to
- **explain presentation of skills**
- **explain elements of skills**
- **explain dale's cone experiences.**

Presentation skills

If you want to be an effective speaker you must have any innate ability. It is an art to stand before the audience and deliver a lecture. You will appreciate that this myth needs to be exploded because you know that learning to become a better speaker or writer or reader or listener requires additional practice.

Effective presentation

You always want to be at your best when you make formal presentations before audiences. There are a number of occasions when you have to make formal presentations. These occasions include: appearance before an interview committee, participation in a group discussion or a seminar, presentation of a lecture before audience and such other activities.

It is true that you are naturally worried before making any formal presentation. Everyone undergoes some kind of stress before any formal presentation. And you don't need to feel anxious. Perhaps, if you are a little cautious, you can overcome the problems very easily. After dealing with your psychological problem, namely anxiety, you have to:

- Plan and organise your presentation
- Analyse the available details
- Prepare well for your presentation
- Gather supporting evidence for your presentation
- Develop your ideas and prepare visual aid for presentation and finally
- Deliver your presentation

Oral presentation

Voice modulation is another important factor we normally tend to ignore. You must pitch your voice appropriately so that everyone in the audience group is able to make sense of your presentation. You must be aware of some of the problems normally associated with your voice.

A monotonous voice can quite distract the listener's attention and prove to be boring to them. The volume of your voice when pitched inappropriately either soft or too loud can prove cumbersome in the process of listener's comprehension. The inappropriate rate of utterance either speaking too fast or too slow; will affect listeners ability to comprehend the details of the presentation.

For receiving questions from the audience, interpreting and responding to them after, formal presentation, a speaker normally allows 10 minutes or 15 minutes

When you make a presentation on any topic, the members of the audience may want to seek some more details or clarification from you. You must encourage the audience to ask questions. You must rise your hands and welcome questions. Allow sufficient time to make the listeners think and ask questions.

Make sure the question is heard by everyone. If you think that the question is not understood by the members of the audience, repeat the question or even rephrase it in such a way that it is understood by everyone. The audience will perhaps now come forward to ask some questions.

When the questioner asks a question, do allow him to complete the question. Do not interrupt. Listen intently to the questioner. Be enthusiastic and listen to him.

Then start answering every aspect of the question. You must display a lot of enthusiasm while answering the questions. You must have prepared well and it should be possible for your to answer the question with a lot of ease.

The following are the presentation of skills in Teaching Practice:

Lack of Continuity

- Break in sequence of ideas or information
- When statement is not logically related to previous
- There is no sequence of place and time.
- Statement are irrelevant.

Lack of fluency

- When teacher does not speak clearly
- Incomplete and half sentence.

Use of vague words and phrases

- Do not give explicit idea about concept
- Hinders students understanding
- For eg. May, actually, you know, somewhat.

Skill of stimulus variation

- The skill of stimulus variation involves deliberate change in attentation drawing behaviour of the teacher in order to secure and sustain student's attentaion to what is being taught.
- Attention tends to shift from one stimulus to other stimulus very quickly.
- A teacher should deliberately change their attention drawing behaviour in class.
- According to Sneha Joshi, "what to change, when to change and how to change requires a skill on the part of the teacher for securing and sustaining attention at high level. Such a skill is named as skill of stimulus variation.
- There are number of factors which have bearing on students attention:
  a Intensity
  b Contrast
  c Movement
  d Extensity or size
  e Novelty
  f Change
  g Striking or unusual quality
  h Self activity
  i Systematic and definite form
  j Audio visual aids
  k Teacher personal behaviour

Components

- **Movements**
  a Move in class
  b To check activities
  c Avoid aimless wandering
- **Gestures**
  a Movements of the parts of the body to direct attention
  b Emphasizing on shape, size etc.,
- **Change in speech pattern**
  a Change in tone, volume, speed
  b Voice modulation
- **Focussing**
  a Direct students attention towards a point
  b Verbal, gestural, verbal cum gestural
- **Change in interaction styles**
  a When two or more communicate with each other
  b T-T,T-P,P-P
- **Pausing**
  a Deliberate silence during talk
  b Neither too short nor too long
  c Give time for answer
- **Change in sensory focus**
  a When teacher changes sensory channel
  b Oral to visual switching, oral to oral-visual, visual to oral-visual
- **Physical involvement of students**
  a In experiments, dramatization, writing on blackboard

Skill of illustrating with Examples

- It involves describing an idea, concept, principle or generalizations by using various types of examples
- The skill is defined as the art of judicious selection and proper presentation of the suitable examples in order to generalize a concept, idea or principle with a views of its understanding and proper application.

Components

- **Formulating relevant examples**
  a Relevant to topic
  b Irrelevant examples will create confusion
- **Formulating simple examples**
  a Are those which are bases on previous knowledge
- **Formulating interesting examples**
  a Attracts attention and curiosity
  b Acc to age maturity
- **Using appropriate media for examples**
  a Non –verbal media of presentation-concrete materials, models, maps, charts, graphs, diagrams on blackboard, pictures
  b Verbal media of presentation-telling stories, anecdotes, analogies
- **Using examples of inductive-deductive approach**
  a Inductive approach- examples to inferences
  b Deductive approach- concept, idea or principle to examples

Suggestions for teaching through illustrations

- Use of simple illustrations
- Relevant illustrations

- Exact and accurate illustration
- Avoid use of too many illustrations
- Proper handling
- Interesting illustration
- Avoid technical language
- Well prepared illustrations
- Timely presentation

Structuring of questions

- Questioning is a very important technique which every teacher should know thoroughly
- Questions are used to help students to recall facts, exercise their reasoning ability
- Questioning is a logical procedure of problem solving
- The teacher encourages the learners to seek more than one answer for a question
- The teacher uses questioning to achieve learning objectives
- To assess students understanding
- It's a critical skill that can be used in any subject and any grade.

Purpose of Questioning

- Help the students display/test their knowledge
- Elicit desired information from students
- Develop subject matter in the class
- Enable students to analyze problems related to the topic being taught
- Enable students to apply their knowledge to a specific new situation
- Help students to evaluate for themselves their understanding of the concepts
- Motivate students to participate in the teaching learning process

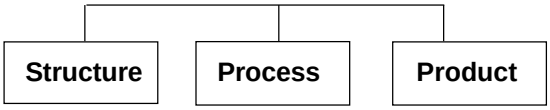
Order of Questioning

- There are four types of questions
  a **Lower ordering Questions -** Limited to memory level of thinking merely deal with mode of expression
  b **Middle order questions** - Involve interpretation of concepts by comparison or explanation, application type questions
  c **Higher order questions** - Encourage children to think, to reason, to analyze, produce new ideas- analysis synthesis & evaluation

Skill of fluency in questioning

- Rate of meaningful questions put per unit time by the teacher is called fluency of questioning
- Meaningful questions are those which are relevant to the concept being taught

3 components



- **Structural questions** - A technique of formulation of questions the content and language used are important. Content means subject matter and language part refers to 5 aspects-
  a **Grammatical correctness**- use grammar correct, unambiguous and simple language.
  b **Conciseness**- refers to the minimal but essential length of question should be direct and straight forward.
  c **Relevancy**- question which are not related to content being taught is irrelevant, suit mental level of student.
  d **Specificity** – specific to content and should call for single answer.
  e **Clarity**- in terms of content and language. It increases fluency.
- **Process** - process of formulating and asking question has more than one aspect-
  a **Speed of asking questions-** not ask at low speed, in pieces and hurriedly
  b **Voice of the teacher** – should be audible and clear, in raised voice
  c **Pause** – defined as the time or the period of silence given by the teacher just after delivery of question
  d **Style** - properly modulated and pleasant tone and friendly manner.
- **Product**- students answer, depends on various factors-
  a Not intelligent to understand the question
  b Language may be difficult
  c Not taking interest
  d Inattentive in class
  e Lack of rapport
  f Lack of previous knowledge

Questioning that should be avoided

- **Yes or no type questions**- they encourage guess work

- **Elliptical questions**- are those which require completion to get answer
- **Echo or Suggestive questions**- are based on concepts or facts just taught. Not have useful purpose to encourage thinking
- **Leading questions** – supplies own answer
- **Rhetorical questions**- which emphasize over a particular point

Skill of probing questions/ response management

- Probing refers to going deep in the matter in hand.
- When teacher asks question there can be 5 possibilities-
- No response, Wrong response, partially correct response, incomplete response and correct response.
- Probing question is a skill of going deep into the pupil's responses by asking series of questions which lead the pupil's towards the correct response or higher level of understanding.
- According to Jangira and associates, " the skill of probing questions may be defined as the art of response management compromising a set of behaviours or techniques for going deep into pupil's responses with a view to elicit the desired response. On account of its emphasis on the ways and means of response management, the skill of probing questioning has been named as the skill of response management.

Components

- **Prompting**- means giving clues or hints to students.
  a Leading from incorrect or no response to correct response.
  b It consist of series of question which help to develop correct response.
  c Can help students for-self confidence, long retention, encouragement and clean understanding.
- **Seeking further information** - this is used when a partially correct or incomplete response is given to elicit more information

  This is to supply additional information to desired response
- **Refocussing** – it is used in a correct response to strengthen the response

  Teacher compares one situation to other and for implication of response to more complex and novel situations.
- **Redirection**- when teacher puts same question to several other students for desired response

  Used in case of no response, incorrect and incomplete response.
- **Increasing critical awareness-** used in completely correct response for increasing critical awareness of pupils'. The pupil justify his response rationally.

Skill of reinforcement feedback skill

- It is a type conditioning in which reward or punishment reinforces the behavior.
- It should come after the response.
- According to Skinner, " if the occurrence of an operant (response) is followed by the presentation of reinforcing stimulus, by the presentation of a reinforcing stimulus, the strength is increased."
- If response is not reinforced it will extinct.
- **Two types of reinforcement**
  a **Positive**- which strengthens the response
  b **Negative**- whose withdrawal strengthens the behavior.
- According to Joshi, " the skill of reinforcement can be defined as the art of learning the judicious and effective use of reinforces by a teacher for influencing the pupil's behaviour in the desired direction directed towards pupil's maximum participation for realizing the better results in the teaching learning process."

Desirable

- **Use of positive verbal reinforces**
  a Use of praise words
  b Use of statements accepting pupils feelings
  c Repeating and rephrasing pupil's response
- **Use of positive and non - verbal reinforces**
  a Writing pupil's response on black board
  b Use of non- verbal actions
- **Use of extra verbal reinforces**

Undesirable

- **Use of negative verbal reinforces**
  a Use of discouraging words
  b Use of discouraging cues and voice tones
  c Use of discouraging statements
- **Use of negative and non - verbal reinforces**
- **Wrong use of reinforcement**

Skill of using blackboard

- BB or chalkboard is real asset in class teaching as it servicer to make direct appeal to child's senses and strengthen the retention.
- The way of using blackboard is called skill of using BB.

- Its importance is because of-
  a Clarity
  b Motivation
  c Wholistic picture
  d Variety

Components

- **Legibility** – when there is maximum ease in reading, following characteristics-
  a Distinctness
  b Spacing
  c Slantness
  d Size of the letters
  e Size of the capital letters
  f Size of the capital and small letters
  g Thickness of the lines
- **Neatness in the blackboard work**
  a Straightness of the lines
  b Spacing between the lines
  c No overwriting
  d Focusing the relevant matter
- **Appropriateness of the written work on the blackboard-**
  a Continuity in the points
  b Brevity and simplicity
  c Drawing attention and focusing
  d Illustrations and diagrams

Suggestions for using BB

- Judicious use
- Accuracy
- Checking the condition
- Check the lightening
- Checking cleaning
- Chalks, duster
- Use of pointer
- Pressing the chalk
- To speak while writing
- Not to cover
- Erasing

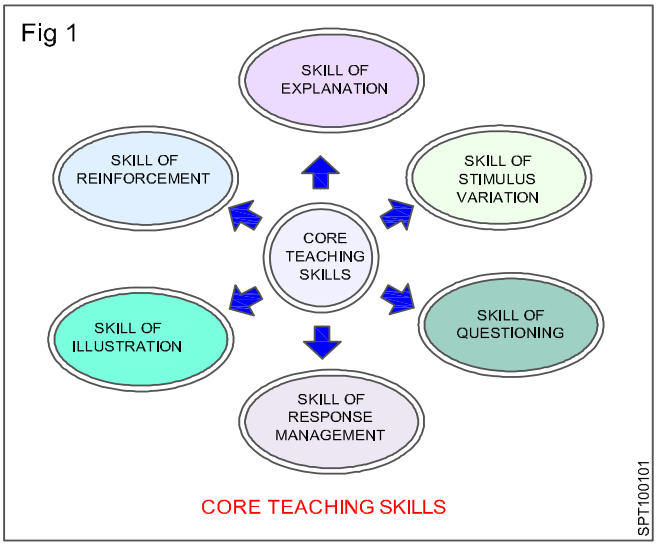
Skill of closure

- The skill is complementary to set induction. It I attained when major purposes, principles and constructs of a lesson or a portion of the lesson are judged to have been learnt and the pupils are able to relate new knowledge with the best. It is more than quick summary of the portions covered. Can use closure by drawing attention to the major points accomplished upto that point.

Components of teaching skills

- Teaching skill is a set of strictly overt behaviours of the teacher (verbal and non-verbal) that can be observed, measured and modified. Its 3 components-
- **Perception**- teaching skill have a perceptual component for observing and receiving feedback.
- **Cognition** – it refers to the behavior or experience of knowing in which there is some degree of awareness, as in thinking and problem solving.
- **Action** – teaching skills demand every teacher to actually practice his/her perceived and acquired knowledge in an effective manner in the classroom

Fig 1



Core of teaching skills

Skill of introducing a lesson/set induction

- The skill of introducing involves establishing rapport with the learners, promoting their attention, and exposing them to essential content.
- Learning a new lesson is influenced by the process in which the lesson is introduced.
- **Components**
  a Maximum utilization of previous knowledge of pupils of the subject
  b General awareness

c Devices and techniques of exploring

d Link between previous and new knowledge

e Creating situations.

- **Using appropriate devices-**
  a Examples, questioning, lecturing, audio-visual aids, demonstration, role playing
  b According to maturity level
- **Maintenance of continuity**-
  a Sequence of ideals
  b Logical
  c Related to students response
  d Linked with teachers statement
- **Relevancy of verbal or non-verbal behaviour-by**
  a Testing previous knowledge
  b Utilizing past experiences
  c Establish in rapport
  d Pin point aim of lesson
  e Need & importance of lesson
- **Arouse interest-**
  a Introducing a surprise
  b Telling a story
  c Showing enthusiasm

Skill of explaining

- Explaining is an activity which shows the relationships among various concepts, ideas, events, or phenomenon
- During teaching in a classroom, an explanation is a set of interrelated statements elaborating a concept being taught or learnt.
- The skill of explaining is defined as an act of bringing about an understanding in some one about a concept, a principle or a phenomenon.
- Explaining is essential a verbal skill and has two main aspects-selection of appropriate statements, Interrelating and using the selected statements.

Categories of explanation

- Interpretive explanation- to make clear the meaning of terms, statements, situation, concepts etc.

  What?
- Descriptive explanation- descriptions of objects, phenomenea, structures, processes

  How?
- Reason giving explanation- principles and generalizations AND CAUSES

  Why?

Components of explaining skill

- **Desirable Behaviours**
  a Introductory statement
  b Concluding statement
  c Use of explaining links
  d Use of visual techniques
  e Interesting to the students
  f Defining technical words
  g Testing students understanding
- **Undesirable Behaviours**
  a Irrelevant statement
  b lack of continuity
  c lack of fluency
  d Vague works & phrases

Desirable behaviour

- **Introductory statement**
  a To draw and maintain students –attention
  b Give clue for the explanation
  c Gives overall picture of explanation
- **Concluding statement**
  a Towards the end to summarize
  b Present consolidate picture
  c To draw logical inference
- **Use of explaining links**
  a Certain linking words and phrases
  b Bring continuity in statements
  c Generally conjunctions or prepositions et. As a result of, because, hence, therefore etc.
- **Use of visual techniques**
  a “One picture is worth ten thousand words”
  b Blackboard, charts, model, pictures etc.
- **Technical words defined**
  a Properly defined
  b If not explanation becomes difficult
- **Interesting to students**
  a By giving examples from daily life
  b Use simple sentences
  c Different media of communication
- **Testing students understanding**
  a Asking appropriate questions
  b Few simple questions

Undesirable behaviour

- **Irrelevant statements**
  - a When not related to the concept
  - b Create confusion, distraction

Dale's Cone of Experience

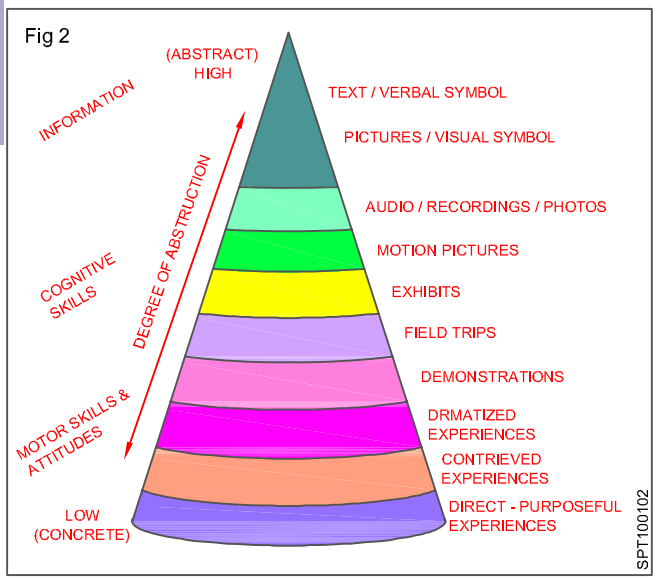
Dale's Cone of Experience is a model that incorporates several theories related to instruction design and learning process.

During the 1960s, " Edgar Dale theorized that learners retain more information by what they 'do' as opposed to what is 'heard', 'read', or 'observed'.

His research led to the development of the Cone of Experience. Today, this 'learning by doing' has become known as 'experiential learning' or 'action learning'.

Dales Cone of experience is a visual model that is comprised of various stages starting from concrete experiences at the bottom of the cone and then it becomes more and more abstract as it reach the peak of the cone. (Fig 2)

Fig 2



Further the arrangement in the cone is not based on its difficulties but based on obstruction and on number of senses involved.

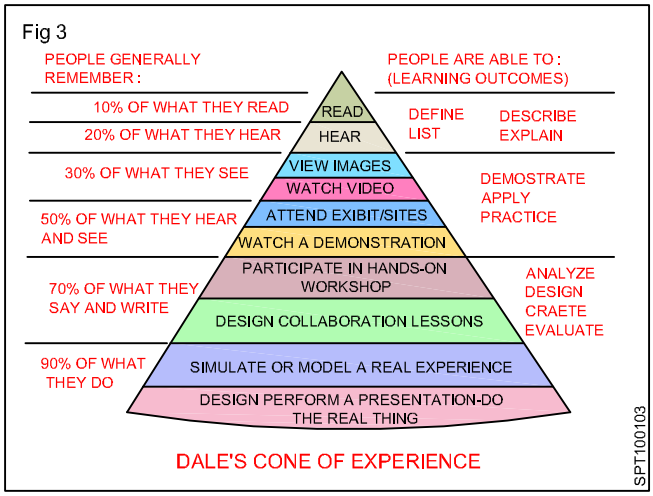
The one of the principles is the selection and teaching more senses that are involved in learning, the more and better the learning will be but it does not mean that the concrete experiences is the only effective experience that educators should use in transforming still to the learner. The experiences in each stages can be mixed and are interrelated.

We should try deeper in each of components of the cone, since education teach what basically resolves around the cone of experience.

Dale's Cone of Experience is a model that incorporates several theories related to instructional design and learning processes. During the 1960's Edgar Dale theorized that learners retain more information by what they 'do' as opposed to what is 'heard', 'read', or 'observed'. His research led to the development of the Cone of Experience. The Cone was originally developed in 1946 and was intended as a way to describe various learning experiences. Essentially, the Cone show the progression of experiences from the most concrete (at the bottom of the cone) to the most abstract (at the top of the cone).

Edgar Dales cone/ pyramid of experience (Fig 3)

Fig 3



Direct Purposeful Experiences

These are first hand experiences which serve as the foundation of learning. In this level, more senses are used in order to build up the knowledge. Also, in this level, the learner learned by doing thing by him/herself. Learning happens through actual hands-on experiences. This level explains and proves one of the principles in the selection and use of teaching strategies, the more senses that are involved in learning, the more and the better the learning will be. This level also proves that educational technology is not limited to the modern gadgets and software that are commercially available nowadays. This shows that even the simple opportunity that you give to each child could help them learn.

The Contrived Experiences

In this level, representative models and mock-ups of reality are being used in order to provide an experience that as close as reality. This level is very practical and its makes learning experience more accessible to the learner. In this stage, it provides more concrete experiences, even if not as concrete as direct experiences, that allows visualization that fosters better understanding of the concept.

The Dramatized experiences

In this level, learners can participate in a reconstructed experiences that could give them better understanding of the event or of a concept. Through dramatized experiences, learners become familiar with the concept as they emerge themselves to the 'as-if' situation.

The Demonstrations

It is a visualize explanations of important fact, idea, or process through the use of pictures, drawings, film and other types of media in order to facilitate clear and effective learning. In this level things are shown based on how they are done.

The Study Trips

This level extends the learning experience through excursions and visits on the different places that are nor available inside the classroom. Through this level, the learning experience will not be limited to the classroom setting but rather extended in a more complex environment.

The Exhibits

This level of study trips is followed by exhibits. It is a somewhat a combination of some of the first levels in the cone. Actually, exhibits are combination of several mock ups and models. Most of the time, exhibits are experiences that is 'for your eyes' only but some exhibits includes sensory experiences which could be related to direct purposeful experie3nces. In this level, meaning ideas are presented to the learners in a more abstract manner. This experience allows student to see the meaning and relevance of things based on the different pictures and representations presented.

The television and motion pictures etc.

The next levels would be the level of television and motion pictures and still pictures, recordings, and Radio. For television and motion pictures, it implies values and messages through television and films.

The visual symbolic and Verbal symbolic

The last two levels would be the Visual symbolic and Verbal symbolic. These two level are the most complex and abstract among all the components of the Cone of Experience, In the visual symbolic level, charts, maps, graphs, and diagrams are used for abstract representations. On the other hand, the verbal symbolic level does not involve visual representation or clues to their meanings. Mostly, the things involved in this level are words, ideas, principles, formula, and the likes.

After going through the different components of the Cone of Experience, it could be said that in facilitating learning, we can use variety of materials and medium in order to maximize the learning experience. One medium is not enough so there's nothing wrong with trying to combine several medium for as long as it could benefit the learners.

Through understanding each component of the Cone of Experience, it could be said that Educational Technology is not limited to the modern gadgets that we have right now but rather it is a broad concept that includes all the media that we can use to attain balance as we facilitate effective and meaningful learning.

To understand more the Cone of Experience, you may refer to this picture: (Fig 3)

Modes of learning in Cone of Experience.

In Edgar Dale introduced the Cone of Experience demonstrate a progression from direct, first-hand experience to pictorial representation and on to purely abstract, symbolic expression.

The Cone of Experience corresponds with three major modes of learning:

- **Enactive (direct experience)** – Enactive or direct experience involves practicing with objects (the student actually ties a knot to learn knot- tying). Enactive experience involves concrete, immediate action and use of the senses and body.
- **Iconic (pictorial experience)** – Iconic experience involves interpreting images and drawings (the student looks at drawings, pictures or films to learn to tie knots). Iconic experience is once removed from the physical realm and limited to two or three senses.
- **Symbolic (highly abstract experience)** – Symbolic experience involves reading or hearing symbols (the student reads or hears the word 'knot' and forms an image in the mind). In symbolic experience, action is removed nearly altogether and the experience is limited to thoughts and ideas.

Some theorists prefer to be more specific and refer to these possible modes of learning

- **Conditioned**- Conditioning refers to learning by pre-design or control via a series of punishments and rewards.
- **Imitative** – Imitation refers to learning tasks by observation or modeling.
- **Trial and error** – Trial and error refers to learning via a series of successful and unsuccessful trials and deliberations.
- **Investigative** – Investigation refers to learning via a series of informed hypotheses and inquiries into problems
- **Expansive learning** – Refers to the questioning of the validity of tasks and problems of a given context to the transformation of the context itself.

Passive and Active Aspects of the Cone of Experience

Although no experience is fully passive, iconic and symbolic experiences are generally more passive than direct experiences. Dale proposed that active and passive modes of participation can be contrasted by assigning a percentage of we tend to remember after two weeks after our experience.

The concrete and abstract aspects in the Cone of Experience

The Cone of Experience invokes a bi-directional movement from the concrete to abstract and from the abstract to concrete. To fully empower teachers with a theory of practice in technology studies, technologies and physical settings have to play a more active role in cognition, emotion and action.

Learning and Experiences

A step model based on Dale Cone of Experience. (Fig 3)

When Dale researched learning and teaching methods he found that much of what we found to be true of direct and indirect (and of concrete and abstract) experience could be summarized in a pyramid or 'pictorial device'

Dale points out that is would be a dangerous mistake to regard the bands on the cone as rigid, inflexible, divisions. He said " The cone device is a visual metaphor of learning experiences, in which the various types of audio-visual materials are arranged in the order of increasing abstractness as one proceeds from direct experiences."

In true sense the bands of the (Edgar Dale's) cone are not only the types of audiovisual materials but the different experiences are also included, In fact the upper four bands like verbal symbols, visual symbols, Radio, Recordings, and still pictures, and motion pictures are more related with Audiovisual materials but the later six bands of the cone like Exhibits, Field Trips, Demonstrations, Dramatic Participation, are the strategies of teaching-learning.

Based on experience of teaching at different levels it was felt that, there are many experiences and audiovisual materials which are missing in dale's cone and to be included by making a new model of experiences which is present in the following Step Learning Experience model.

The base of the step learning experiences model is direct and purposeful experience which is always preferable for any new learned and any kind of learning concept and gives firsthand experience in turn leads to the permanent learning. At the tops of the cone is verbal or text these are the least effective ways to introduce new content to students. The step learning experience model includes 17 different experiences.

Verbal symbols

Verbal symbols are words, sentences, sounds, or other utterances that are said aloud in order to convey some meaning. The verbal symbol may be a word, an idea, concept, a scientific principle, a formula, a philosophic aphorism or any other representation of experience that has been classified in some verbal symbolism.

Olfactory Experience

It is also called Aroma Experience; Aroma is a quality that can be perceived by the olfactory sense. It is a type of Experience where the learner can have the concrete idea of the abstract thing through the sense of smell.

Gustatory Experience

Gustatory is an adjective that refers to tasting or the sense of taste, Gustatory has its roots in the Latin Gustare, meaning "to taste," It is a type of Experience where the learner can have the concrete idea of the thing or object or concept through the sense of taste.

Tactile-kinesthetic Experience

It is a type of Experience where the learner can have the idea or the concept of the thing or object through the sense of touch and feel; it is learning through a hands-on approach and learners will be physically involved. Kinesthetic Learning Experience refers to one of the modalities that learners use in order to approach and absorb new information.

Kinesthetic-tactile refers to a pupil who learns by movement and by touching. This type of experience can be given through hands-on activities, manipulating objects or flash cards, working problems or re-typing notes.

Visual symbols

Visual symbol may be a picture or shape that has a particular meaning or represents a particular process or idea. Something visible that by association or convention represents something else that is invisible; and something that represents or stands for something else, usually by association or used to represent something abstract. Visual experience has a rich predictive structure.

Still Pictures, Radio, and Recordings

This stage includes a number of devices that might be classified roughly as "one dimensional aids" because they use only one sense organ that is either eye (seeing) or ear (hearing).

Motion pictures, Television and computers

These can eliminate the unnecessary and unimportant material and concentrate upon only selected points. The important processes can be watched with slow motion and vital content and issues can be repeated number of times. The pupils are mere spectators and are distant from the experiences like touching, tasting, handling and feeling from directly experiencing.

Television's influence on language habits, vocabulary, consumer patterns, cultural values and behavior patterns should not be underestimated.

The present day computers are not only compact, extremely powerful and versatile, commonly accessible and easy to use. The computer has, indeed become an integral part of our teaching process and daily life. Students then simulate the entire lab experience using the CAI, which saves times, resources.

Exhibits

In education normally the arranged working models exhibited in a meaningful way. Sometimes they may be series of photographs or of photographs mixed with models and charts. The opportunity to handle the materials by the participant makes the way to use more sense organs and Learning by doing always helpful for meaningful or concrete learning.

Demonstrations

A demonstration is another means whereby pupils can see how certain things are done. Demonstration may require nothing more than observation on the part of the pupil or observer. It is the act of showing or making evident or circumstance of proving or being proved conclusively as by reasoning. It may be description or explanation of a process and illustrated by examples, specimens and it also includes the act of exhibiting the operation or use of a device, machine, process and product.

Dramatization

There are many things we cannot possibly experience at first hand and we cannot experience directly something that has already happened.

Furthermore some matters cannot be reduced to contrived experience and some ideas must of necessary be somewhat abstract and symbolic.

Dramatic participation can help us get close as possible to certain realities that we cannot reach at first hand.

Contrived Experiences (Artificial Experience)

A contrived experience is editing of reality, an editing which makes the reality easier to grasp. It may be illustrated by working model and it differs from the original either in sixe or complexity; contrived experiences lead to a suspension of disbelief. In other words, during the period of experience, the learner believes in the reality of the experience.

Virtual learning experience

Though the virtual experience can be called as contrived experience but the pupils level of experience may differ and the kind of joy and level of understanding may be high at virtual than the contrived experiences which include models mock ups and cut-away as we can consider them as hardware. A virtual learning experience involves a set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process. The representation of the learning environment ranges from text-based interfaces to the most complex 3D graphical output.

Smart boards are the best examples for virtual experience where students can conduct science experiments in simulated way. In virtual experience pupil can see and hear but not use the senses of touch and smell. We can bring reality in the classroom which is more than contrived experience and as near as the real experience.

Four-Dimensional Experiences

Four-Dimensional Experiences that describes a presentation system combining a Three Dimensional film with Physical effects in the theater, which occurs in synchronization with the film.

Ubiquitous learning Experience

Ubiquitous means "pervasive, omnipresent, ever present, and everywhere"'. A ubiquitous learning experience is any setting of the environment in which students can become totally immersed in the learning process. To define, it is a kind of experience where learning is happening all around the student but the student may not even be conscious of the learning process.

The Ubiquitous learning Environment includes an ubiquitous computing technology-equipped system supplies users with timely information and relevant services by automatically sensing users' various context data and smartly generating proper results.

Direct Real Experience

Direct real experience can give greater experience in learning for the students than virtual or contrived experiences. The pupil will have an opportunity to observe and study directly. Hence its impact may be high on learning than the other earlier experiences. It is also an alternative experience to the direct purposeful experience. When teachers are unable to provide direct purposeful experience, they may only have the best option of direct real experience.

Direct Purposeful Experience

The Base of the Step Learning Experiences Model represents direct reality itself as we experience it at first hand. It is the rich full bodied experience that is the base of education. It is the purposeful experience that is seen, handled, tasted, felt, touched, and smelled. It is the experience of life and we get it by living. Some of our richest, most vivid sense impressions are those which involve our feelings and perceptions in an eager exploration of the world.

Critical Appraisal

The cone of experience given by Edgar dale has rightly said that it is not offered as a perfect or mechanically flaw less picture to be taken with absolute literalness in its simplified form. It is merely a visual aid to explain the interrelationships of various types of audiovisual materials, as well as their individual positions in learning process.

The use of audio-visual materials in teaching does not depend primarily upon reading to convey their meaning. It is based upon the principle that all teaching can be greatly imp[roved by the use of such materials because they can help make the learning experience memorable we do not mean that sensory materials must be introduced into every teaching situation.

Practicability of Learning Pyramid

In order for students to develop meaningful knowledge, feelings and skills, their direct experiences must be "associated with abstractions" as Dale noted. Language and expression are essential; to skill acquisition.

Beyond its sketchy background, the learning pyramid should raise concerns:

- What kind of research results end up in such tidy percentages, all multiples of 10?
- How would one even develop a method for testing such broad claims?
- Do we really believe a learner can remember 90% of anything?
- Can an activity be separated from its content and be given credit for learning?

Many distinguished authors have gutter the pyramid's claims. Educational expert Daniel Willingham was against the pyramid related to oversimplification; providing an optimal learning experience does not boil down to the instruction method. There are may different variables that impact learning.

Looking at Dale's cone of Experience, one can realize that there can be numbers of model that can be used by the teacher to reach the learner depending on the learners need. Despite the pyramid having been debunked in many venues for decades, it continues to show up in educational presentations and literature.

To conclude, the Cone of Experience is essentially visual metaphor for the idea that learning activities can be placed in broad categories based on the extent to which they convey the concrete referents of real-life experiences.

Components of Micro - Teaching

Objectives: At the end of this lesson you shall be able to
- **define micro teaching**
- **list the components of micro teaching**
- **brief each components of micro teaching.**

Introduction

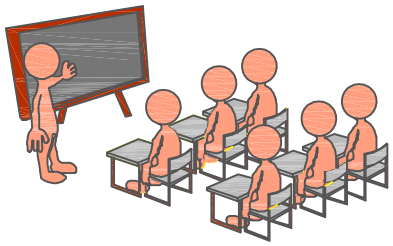
Micro-teaching is a teacher training and faculty development technique whereby the teacher reviews a recording of a teaching session, in order to get constructive feedback from pupils and/or students about what has worked and what improvements can be made to their teaching technique.

Micro-teaching was invented in the mid-1960s at Stanford University by Dr. Dwight W. Allen, and has subsequently been used to develop educators in all forms of education. In micro teaching session, teaching will be done for small number of learners for short duration of time usually less than 20 minutes. It may be recorded on video.

Definition

Microteaching is defined in many ways, However Mr. B.K. Passi is defined as micro teaching is a training technique which requires student, teachers to teach a single concept using specified teaching skill to a small number of pupils in a short duration of time

Fig 1



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Teaching skill

The major premise underlying the technique is that the complex teaching act can be analyzed into simple limited and well defined components called teaching skills, there skill can be taught understood, practiced evaluated predicated.

A large number of skills have been identified abroad and India.

Turney, et.al. (1976) provide a most exhaustive list of teaching skills which includes both the general teaching skills and specific skills useful for teaching of a particular subject. The number of skills given by them exceeds eighty.

The Organisation of Microteaching Programme at Standard University: The Standard Microteaching clinic was designed to provide training and practice in basic instructional skill for 150 preservice teacher-trainees. The elements and components of the programme were arranged in the following manner at Stanford University.

- Presentation of theory
- Modeling
- Planning
- Performance
- Perception and Feedback
- Integration of teaching skill

Presentation of theory

Presentation of theory of micro lesson was done mainly through lecture and discussion method. The teacher-trainees where given sufficient of opportunities to get purposes and uses of the skills in the class-room.

Modeling

The modeling was organized by presenting live demonstration. There was a discussion on model after the trainees received a live or tape demonstration, lessons through out the week.

Planning

A planning was done by teacher-trainees himself mainly as a home assignment. Re-planning was done after 10 minutes, critique. Session nearly 15 minutes were provided for re-planning.

Performance

i The micro lesson was conducted for five minutes.

ii School pupils were invited for participation. Hence, it was use of real condition. There was lessons were videotaped.

Perception and Feedback

During feedback session normally the supervisor tried to get the trainee to estimate his success with respect to the particular skill being worked on. Then they moved on to the students and supervisors rating reports, which dealt with aspects of the skill to be learned. Feedback was by supervisors and along with videotape, simple rating forms were also used, rating was done by student teachers and supervisors.

Integration of teaching skill

The lesson for integration of teaching skills were named as micro lessons. Usually the skills selected for the micro class were the skills appropriate for longer lessons and along with these skills the trainees were also expected to demonstrate the earlier acquired teaching skills. The 20 minutes lesson was followed by thirty minutes of group critique session. The experience of micro lessons helped the trainee to use the various skills in an integrated fashion. The organisation of the various components of microteaching programme at Stanford University are discussed so far. However later on these components were greatly modified in different Universities all over the world. These modifications were done for the purpose of feasibility or on the basis of experience and research.

The components of Micro Teaching are given in Table 1

Table 1

Sl. No.	Components	Dimension
1	Presentation of Theory	1 Lecture 2 Discussion 3 Written self Instructional material 4 Multimedia package
2	Modeling	1 Perceptual Model like- a Live demonstration b Video recorded c Audio recorded d Film 2 Symbolic model i.e. written model
3	Planning	1 Self-planning 2 Planning under guidance 3 Different formats used
4	Performance	1 Conditions a Real b Simulated 2 Number of pupils 3 Time variations
5	Perception and feed back	1 Used of video-audio type 2 Use of rating system, counting system 3 by peer, by supervisors 4 Immediate; delayed feedback
6	Integration of Teaching skills	1 Number of skills 2 Strategies of integration

Model Questions

Theory 10.2

6 In which year Micro Teaching was invented?

A End of 1958 B Mid of 1959

C Mid of 1960 D End of 1960

7 In the instructional objectives in which tense objectives are written?

A Presentence

B Pastence

C Futuretence

D Past presentence

8 Under which skill the maintenance of accuracy falls?

A Skill of Introducing lesson

B Skill of Probing Questions

C Skill of Explaining

D Skill of reinforcement

9 Which skill keeping the pupil eye span?

A Integration of teaching skill

B Skill of stimulus variation

C Skill of reinforcement

D Skill of classroom management

10 Which one is the component of skill of stimulas variation?

A Skill of Explaining

B Keeping pupils in eye span

C Prompting techniques

D Change in interaction style

Micro - Teaching Practice and its evaluation

Objectives: At the end of this lesson you shall be able to
- **explain what is micro teaching**
- **principles of micro teaching**
- **advantages of micro teaching**
- **limitation and disadvantages of micro teaching**
- **micro teaching evaluation**
- **plane, prepare and conduct micro teaching.**

Micro teaching

- The art of microteaching is a complex process.
- It is not limited to transferring of knowledge from one to another.
- Micro teaching needs verbal and non-verbal skills.
- To transfer the knowledge more effectively it requires multiple techniques.
- Every one cannot be master of micro teaching.
- Due to broad growth of all sectors of teaching, effective skill teaching has great demand.
- Because of more need of skill, the concept of micro teaching came into action.
- Micro teaching is a new program which brings latest new teaching technologies to Instructors/trainer/ teachers which increase class room attitude and behaviour.
- Many training institute have taken up micro teaching practices in order to equip their instructors with effective method of teaching.

Principles of micro teaching revolves on certain principles to improve the micro teaching methods and which reaches to the instructors for their development.

The following are the certain principles given below.

One skill at one time

In skills in micro teaching are targeted one at a time. Training on particular skills are given until it is mastered. Once mastered another skill is targeted next. Thus micro teaching aims for one skill at a time.

Small scale content

Limiting the content gives more freedom and ease to the trainees. Thus, micro teaching is based upon the principles of limited content. Teachers are to prepare their lessons within the given content therefore it becomes easier for them to conduct their lessons.

Practice makes a man perfect

Mastering skills require practice. While focusing on one skill at a time, micro teaching program also gives an opportunity to practice those skills. Lots of practice can boost the self-confidence and promote in development of teaching skills.

Experiments

Experiments are the key factors in any concept. In micro teaching, many experiments are conducted in order to test the skills of the teachers.

For example, the supervisors conduct experiments where the length of the lessons, time duration, strength of students in the class etc is changed. These skills are tested under controlled condition.

Instantaneous feedbacks

Micro teaching consists of teacher-learner and supervisor as students. Once a session ends, teacher-learner and supervisors come up their feedback. This feedback is given instantly after the lesson plan ends. Thus, it helps in rectifying the drawbacks.

Self-evaluation opportunities

Evaluation plays an important role in any task. In micro teaching supervisors conduct various test and thus there are several chances to analyze mistakes.

Evaluation gives and opportunity to understand the mistake and overcome it. This program includes a session where drawbacks are pointed out along with their solution. Thus, overall improvement becomes an easier target.

Continuous efforts

Acquiring and mastering skills is a slow and ongoing process. Even after mastering a previous skill, one should continually strive for betterment. Continuous efforts makes it easier to attain overall development.

Concept of micro teaching

Micro-Teaching is a special teaching practice model or teaching training method. In this teaching context, there contains many actions like use of methods, usage of media, learning guide, motivation, classroom management, assessment, analyzing and so on.

The concept of microteaching is mainly based on the following points

- Teaching in its real form but with a minimum concept.
- The exercise which is designed focuses mostly on the basic teaching skills with the help of feedback based on the knowledge and information of student learning level.
- The teaching is conducted for students who are from different backgrounds and their intellectual abilities.
- Monitoring the micro teaching exercises conducted in classrooms.
- Enabling the prospective teachers to learn effective teaching skills.
- Helping the students to actively participate in teaching by providing low risk situation.
- It also offers opportunities for retraining at regular time intervals.

Procedure of Micro teaching

Skill definition

The pupil teacher or the supervisor defines a certain skill. The skill of micro teaching are defined regarding the teaching behaviors in order to procure knowledge of required skills, which they have to focus on.

Demonstraton

Demonstration is the second step in the process. Experts demonstrate the specific skill by themselves or with the help of audio \ video tape recordings to the teacher trainee. This gives an idea to the teachers to work accordingly.

Lesson planning

This step is the first action by the student teacher. The trainee teacher plans a short lesson through which he/she could practice the skill. This microteaching lesson plan is done with the help of his supervisor.

Conducting lesson

Once the planning is done, according to the targeted skill the pupil-teacher teaches the planned lesson to the group of students. These lessons are observed by supervisor and pupil teachers.

Further, they are video-taped, audio-taped, or televised through a CCTV camera. These tapes are later used for self-evaluation as well.

Discussion and conclusion

Once the teaching session comes to an end it is followed by a concluding session. Concluding session consist of feedback by the supervisor.

During this session, the audio or video recording may also be displayed in order to give an opportunity to evaluate oneself. Moreover, it also boosts the confidence level of the trainee. It is the best way to reinforce the trainee to work better the next time.

Re-planning

Mastering a skill is an ongoing process. Thus, once the cycle of micro teaching revolves, the process is repeated. This repetition involves re-planning of the lesson plan. The aim of this re-planning is to master the skill mentioned earlier.

Re-teaching

On completion of the re-planning of the lesson, it is again taught to another group of students from the same class. The time duration is kept as same as the previous class. This method contributes in practicing the skill repeatedly.

Re-discussion

At the end of re-teaching session, the discussion and conclusion step is repeated. These discussion and suggestions encourages the performance of the trainee. Thus, the process of feedback is procured to enhance the performance further more.

Redoing

After the end of every session, this cycle is repeated. The repetition is continued until the required skill is mastered. This process is repeated while attaining all the required skills.

Thus, we can conclude that micro-teaching involves the 4R's viz, Recording, Re-teaching, Re-discussing and Redoing.

Three Phases of Micro teaching

Knowledge acquisition

This is the first phase of micro teaching. It includes collection of data. In this phase, the trainee teacher gathers knowledge about the required skills by reading different literature as well as going through certain demonstrating videos.

Further, this phase includes the understanding of required skill in a rational manner, as a classroom component.

Skill acquisition

This is the working phase of micro teaching program. Under this phase the trainee teacher is asked to prepare lessons and practice, skills based on the model presented at the start.

Here two factors are of major importance of micro teaching i.e. the feedback and the setting. Setting includes the length of the lesson, the duration of the class, the skill to be obtained, supervisor and the students.

Transferring phase

This is the last and major phase of micro-teaching. Here the trainee comes out in a real situation, which is not controlled.

Here the teachers as well as the students get the platform to learn and grow. This takes place in a real classroom, unlike the previous stages of micro teaching.

Benefits or Advantages of Micro Teaching

Micro-teaching is a platform for beginner teachers to improve teaching competencies. Here are few micro teaching benefits

Elasticity of practice

Micro-teaching helps in developing various skills in trainees as well as the current teaching staff. It helps in improving the handling skills of the teachers. It gives better opportunity due to small-scale teaching.

Moreover, it broadens the knowledge of various techniques of teaching.

Confidence booster

Micro teaching is a personality enhancer too. Due to several micro teaching activities and practices, micro teaching effectively increases the confidence level of the teachers. Moreover, the experience of teaching enables them in better classroom management.

Budget oriented

Unlike other various programs and seminars that are very costly, micro teaching program is budget oriented. Teachers can practice within the real class or at any other place.

More learning and less damage

Micro teaching program is conducted with not more than 3-4 students at a time. This makes it possible to acquire a better teaching experience. In addition, it lessens the chances of mistakes.

Improves attitude

A positive attitude contributes to better results. Thus, one of the objectives of this program is to guide the trainees to attain a positive attitude towards any criticism. As a result, negative feed backs also motivate the trainees to strive for betterment.

Promotes systematic lesson planning

Lesson planning is one of the skills that a teacher needs to master. Micro teaching program, within a given content, helps the trainee to prepare systematic lesson plans.

Instant feedback

Feedbacks are the best way to improve. Micro teaching enables the teachers to gain instant feedbacks from the supervisors. An instant feedback gives more potential for rectifying mistakes.

Mastering skills

This program helps in mastering types of micro teaching skills and strategies like lecturing, questioning, probing and initiating discussions. Further, it helps in improving a separate teaching style.

Limitations or Disadvantages of Micro Teaching

The following mentioned are few micro teaching limitations.

Hampers the creativity

Creativity is the core of any job. It flows along with the task. However, in process of micro teaching, due to limited period, it becomes difficult to bring out that creativity.

Thus, micro teaching does not contribute in increasing the bars of creativity.

Training Staff

Better teaching promotes better learning experience. Similarly, for better teaching one needs to undergo better training as well.

Micro teaching course benefits teachers in gaining that experience, but it requires well-trained educators to train the teachers. Without a proper educating staff, it is impossible to implement micro teaching course.

Lesser student lesser interest

Teaching is an art. However, not everyone is capable of teaching. Any job needs passion and interest. They play a key role in driving the person to strive for improvement.

In micro teaching program, there are maximum 3-4 students therefore lesser students fail to motivate the teacher to improve. Instead there are chances of teachers losing their interest altogether.

Wastes a lot of time

Micro teaching is teacher oriented activity. Here in, the focus is on improving efficiency in teaching techniques. Each session lasts around 5 – 10 minutes minimum. During this period, the aim is to develop teaching skills and thus student learning is ignored. It certainly wastes the time of student, as it does not benefit him.

Further, for practicing several times, various students are called at different period. This may also hamper their overall academic performance. Thus, it is advisable to conduct the training program keeping in mind all the factors.

Training period timing

Micro teaching program is undoubtedly a benefiting course to the teaching staff. It is a promising method for the holistic development of the teachers in the teaching field.

However, there is one minor drawback of this program. The training period is not enough to develop all the required skills properly. In addition, one trainee needs approximately 35 minutes to practice once. Not more than ten trainees can practice once within five hours. It is certainly a time consuming program.

Not realistic and practical

Micro teaching is a very advanced form of learning however; it does have its own limitation. When it comes to teaching a diverse level of students at once, it becomes a hassle. During the training, the strength of the students is limited however when the strength of students is increased it seems like a problem.

This program manages to keep the teachers away from the real classroom problems. As a result, trainees struggle in maintaining classroom behavior. Moreover, artificial situation do not help in preparing teachers for real time situation.

One alone is not sufficient

Micro teaching is a concept innovated at Stanford University by Professor Robert Bush and Dwight Allen. One of the principle of micro teaching is skill enhancement.

However, these skills are targeted one at a time and so not all skills are developed within the given period. Thus, integration of different micro teaching techniques is needed.

One at a time

Apart from the skills, micro teaching involves only one trainee at a time. For a single session of training, it requires approximate 35 minutes.

Thus, single trainee can practice only once in 35 minutes. It is not only time consuming but also an irritating process for the supervisors if there are more then ten trainees in a batch.

Micro teaching is indeed an advanced level of teaching program that enables the teachers to gain confidence before stepping into the profession of a teacher.

With the vast impact of globalization on every aspect of the world, there is certainly need of various schools. Efficient and effective teaching is one of the major factors parents look at before enrolling their children into a school.

Thus, implementing a micro teaching programs for new teachers as well as in service teachers are an ideal way to set foot with the world. Pros and cons are a part of every innovation and thus keeping in mind those aspects one should opt for the suitable program. Micro teaching is a widely accepted technique adopted and approved by various institutions.

Micro teaching practice evaluation

Following form is used to assess the Instructor / POT Trainees while performing their micro-teaching lesson.

Name :_____

Rate the student's performance based on the criteria in the table. From 1 to 5 according to their performance.

1 - poor / need improvement

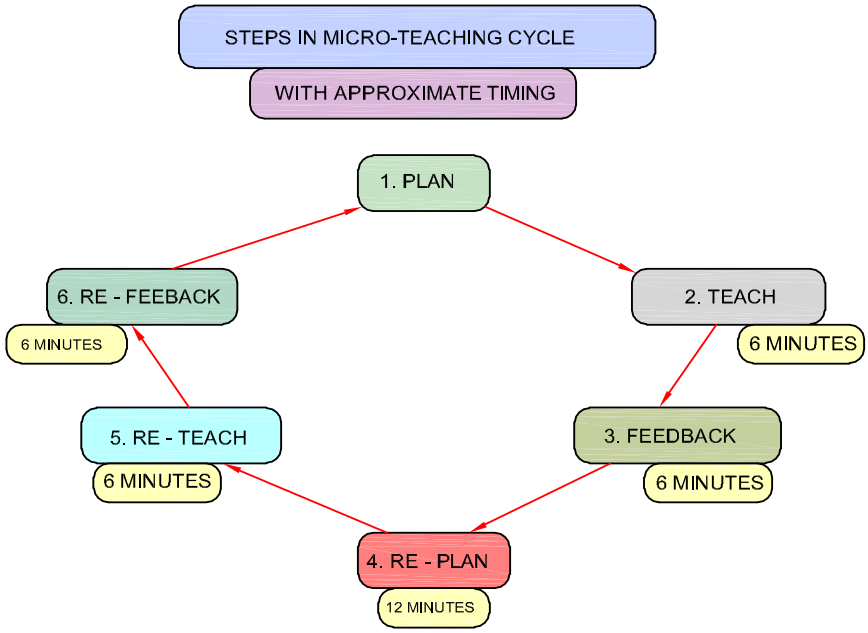
2 - below average

3 - average

4 - good

5 - outstanding.

Fig 1



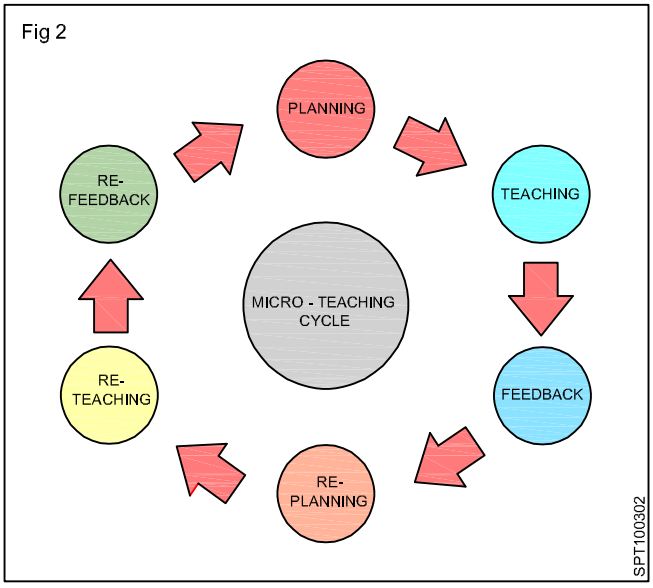
Observations		1= Need improvement to 5=Outstanding
1	Subject knowledge	1 2 3 4 5
2	Stating title of the lesson	1 2 3 4 5
3	Stating the objectives clearly	1 2 3 4 5
4	Audibility of voice	1 2 3 4 5
5	Links the previous knowledge to the present topic	1 2 3 4 5
6	Motivates the trainees	1 2 3 4 5
7	Encourages trainees participation	1 2 3 4 5
8	Asking questions	1 2 3 4 5
9	Eye contact	1 2 3 4 5
10	Encouraging the responses / answers	1 2 3 4 5
11	Use of Chalk / white board	1 2 3 4 5
12	Presentation skill	1 2 3 4 5

Strength:

Weakness:

Recommendation to improve teaching skills:

Fig 2



Micro teaching practice

- Each trainees will conduct micro teaching for 10 minutes duration / by selecting a single objective / pertaining to his/her trade subject.
- Plan-prepare for conducting micro teaching.
- Conduct micro teaching for 10 minutes presentation duration.
- Get critics from the participants.
- Re-plan - prepare and the present.
- Get the feed back.

Theory 10.1

I Multiple Choice Question items

Choose the correct answer:

1 Under what term in presentation of skill in teaching the statement given lies "statement are irrelevant?

A Lack of fluency

B Lack of continuity

C Lack of subject knowledge

D Using vague words and phrases

2 What is the term for structural question when the questions are not related to content being taught is irrelevant?

A Conciseness

B Relevancy

C Clarity

D Specificity

3 What type of questions to be avoided?

A Yes or No type questions

B Elliptical questions

C Leading questions

D Phetorical questions

4 What is the name of the experiences that lead to a suspension of disbelief and during the period of experience the lecturer believes in the reality of the experience?

A Virtual learning experience

B Four dimensional experience

C Contrived experience

D Ubiquitous learning experience

5 What is the name of experience that the base of the step learning experiences model represents reality itself and are experience at first hand itself?

A Virtual learning experience

B Direct real experience

C Direct purposeful experience

D Four dimensional experience

Theory 10.3

11 Which type of teaching method helps for beginner teacher to improve compentencies?

A Lesson method of teaching

B Demo method of teaching

C Group discussion method of teaching

D Micro method of teaching

12 In which type of teaching "More learning and less damage"

A Micro teaching type

B Lesson plan type

C Lecture method type

D Discussion type

13 What is the name the term in which teacher as well as the students get the platform to learn and grow?

A Knowledge acquisition

B Skill acquisition

C Transferring acquisition

D Habit formation

14 In which teaching aims for one skill at a time

A Class room teaching

B Lecture method teaching

C Demonstration method

D Micro teaching method

15 What is the name on completion of the lesson, it is again taught to another group of students from the same class?

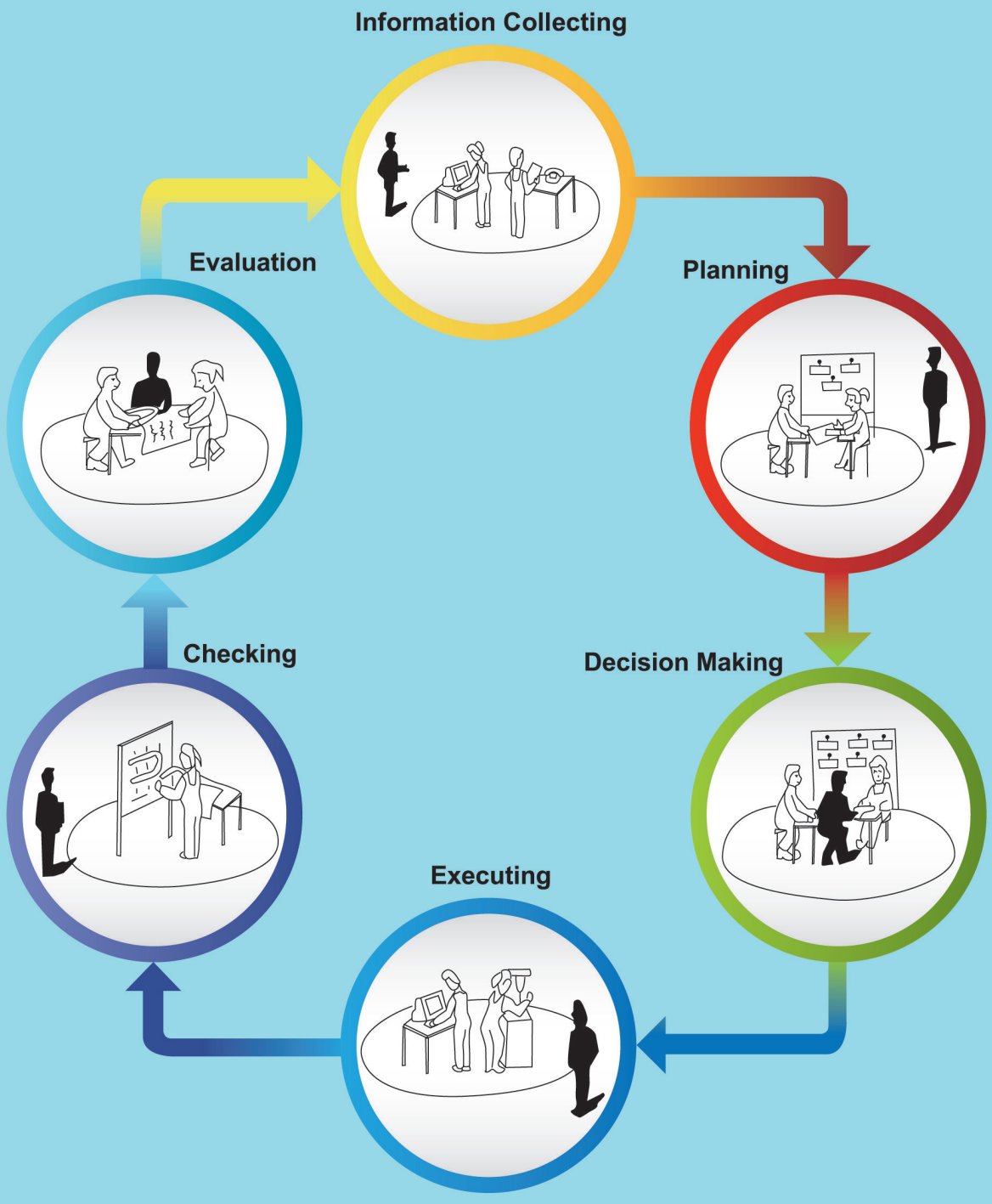
A Conducting lesson

B Re planning

C Re teaching

D redoing

Multiple Choice Question items - Answer keys										
Theory no	Question no	Ans	Question no	Ans	Question no	Ans	Question no	Ans	Question no	Ans
1.1	1	b	2	c	3	b	4	a	5	c
	6	d								
1.2	7	d	8	c	9	c	10	a	11	c
1.3	12	a	13	a	14	c	15	d		
1.4	16	a	17	a	18	d	19	b	20	a
2.1	1	c	2	a	3	c	4	d	5	b
2.2	6	a	7	a	8	b	9	d		
2.3	10	a	11	c						
2.4	12	d	13	b						
3.1	1	c	2	d						
3.2	3	d	4	c						
3.3	5	a	6	a						
3.4	7	a	8	b						
4.1	1	a	2	c	3	b	4	a	5	a
4.2	6	c	7	d	8	c	9	d	10	c
4.3	11	a	12	d	13	c	14	a	15	d
4.4	16	c	17	b	18	c	19	b	20	b
4.5	21	d	22	b	23	a	24	d	25	d
	26	c								
5.1	1	b	2	d	3	c	4	c	5	a
5.2	6	c	7	a						
5.3	8	c	9	d						
6.1	1	d	2	a	3	b	4	a		
6.2	5	a	6	b	7	c	8	c		
6.3	9	b	10	a	11	b				
6.4	12	b	13	c						
6.5	14	c	15	a						
6.6	16	c	17	b	18	b				
7.1	1	a	2	c	3	b	4	d		
7.2	5	c	6	c	7	c	8	a	9	d
7.3	10	a	11	d						
8.1	1	a								
8.2	2	a	3	b	4	c	5	c	6	b
8.3	7	b	8	b	9	c	10	a	11	a
8.4	12	a	13	c	14	a	15	b	16	c
8.5	17	a	18	d						
9.1	1	a	2	a						
9.2	3	a	4	b						
9.3	5	a	6	c	7	b				
9.4	8	a	9	b						
9.5	10	d	11	a						
10.1	1	b	2	b	3	a	4	c	5	c
10.2	6	c	7	c	8	a	9	d	10	d
10.3	11	d	12	a	13	c	14	d	15	c



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NATIONAL INSTRUCTIONAL MEDIA INSTITUTE (NIMI)
P.O. Box - 3142, CTI Campus, Guindy, Chennai - 600 032
Phone: 2250 0248, 2250 0657, 2250 2421 Fax: (044) 2250 0791
E-mail: chennai-nimi@nic.in, nimi_bsnl@dataone.in Website: www.nimi.gov.in

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