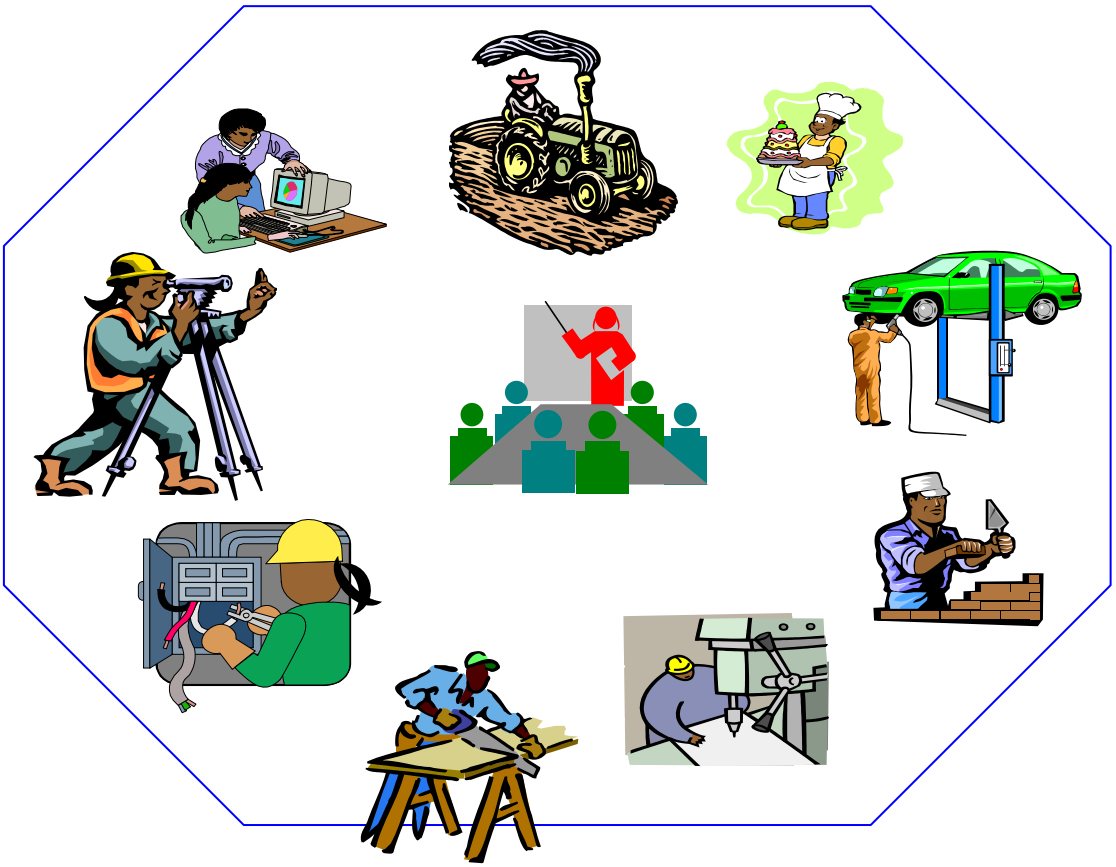
ADVANCED BIOMEDICAL EQUIPMENT MANAGEMENT

L-IV

Based on May, 2011 Version 2 OS and Feb, 2021 Version 1 Curriculum



Module Title:-Train Biomedical Equipment End User
LG Code: EEL BES4 M06 LO (1-5) LG (27-31)
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Contents

LG #27	LO #1- Plan the training
Instruction Sheet	

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Identifying and categorizing
- identifying equipment end user
- Developing training for plan end-users.
- Integrating training plan.
- submitting training plan.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically,

Upon completion of this Learning Guide, you will be able to:

- Identify and categorize biomedical equipment
- identify equipment end user
- Develop training for plan end-users.
- Integrate training plan.
- Submit training plan

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets 1”.
3. After reading the information sheet 1, sheet 2, sheet 3, sheet 4, sheet5, go to your instructor and get the copy of self-check.
4. Accomplish the “Self-check 1” Self-check 2” Self-check 3” Self-check 4” Self-check 5” in page 11, 12, 15, 17 19.
5. If you earned a satisfactory evaluation proceed to LO2. However, if your rating is unsatisfactory, see your teacher for further instructions.
6. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Identify and categorize biomedical equipment

1.1 Types of Medical Equipment

1.1.1 Diagnostic Equipment

Diagnostic medical equipment is any type of equipment or tools used in a hospital setting for the sole purpose of diagnosing a patient's condition. Based on the symptoms described by the patient, a diagnostic test is performed using the appropriate equipment to evaluate the patient internally. The doctor or technician is looking for any abnormalities in the affected organs or parts of the body that are causing the symptoms to be exhibited.

Below are some of the most common types of diagnostic equipment used in laboratories and medical clinics:

Medical imaging machines – Medical imaging is a type of technology that is used to create visual representations of the human body's interior. The visual image produced by the equipment is used for clinical analysis and medical intervention. There are many medical imaging equipment, such as radiography (X-ray machine), computed tomography (CT scan), magnetic resonance imaging (MRI scan), ultrasound, and echocardiography, to name a few.

Aside from medical imaging machines, there are other medical devices used for diagnosing patients. Some examples include patient scales, stethoscopes, dopplers, and pulse oximetry.

1.1.2 Durable Medical Equipment (DME)

This type of medical equipment is used mainly for providing therapeutic benefits for certain conditions or illnesses. The use of this equipment must be prescribed by a physician, which is designed to serve a medical purpose. It is a long-term and reusable device that can be used in the hospital or at home for patient care. There are several types of durable medical equipment such as the following:

- Manual wheelchairs or electric wheelchairs
- Hospital beds
- Walkers, crutches, canes (or any similar type of mobility assistive equipment)
- Traction equipment
- Pressure mattresses
- Insulin pumps
- Breast pumps
- Nebulizers
- Patient Lifts
- Bili lights and blankets
- Kidney machines
- Stationary or portable oxygen tanks
- Oxygen Concentrators Ventilators

The term ‘durable’ is derived from the fact that these types of equipment have been tested for quality. They are designed to provide support for the safety and comfort of the patients. They should be able to deliver just that. Some of the common features of durable medical equipment include non-slip features and load-bearing strength. Since this equipment is prescribed by the physician for the benefit of the patient, the cost of acquiring one is often covered by health insurance plans.

1.1.3 Durable Medical Equipment

Treatment equipment is any type of medical device or tool that is designed to treat a specific condition. It utilizes modern technology in order to address any abnormalities to restore function in the affected organs or tissues within the body. This can also include the surgical supplies designed to provide treatment for certain conditions that require surgical intervention.

Below are common examples of medical treatment equipment that you will find in hospitals and clinics:

- Infusion Pumps – This type of treatment equipment is used in a hospital setting. It is designed to infuse medication, fluids, and other forms of treatment to the patient’s circulatory system. This machine is used intravenously but you can also find epidural

or arterial infusions. This machine is reliable because it injects controlled amounts of fluids into the patient's system over a given period of time.

- LASIK Surgical Machines – The use of LASIK technology is used primarily for the treatment of eye conditions. It is designed for use on patients suffering from myopia, hyperopia, or astigmatism.
- Medical Lasers – The laser is a revolutionary technology introduced in the medical field for the treatment of various medical conditions. It is a device that emits a wavelength of electromagnetic radiation for clinical applications. These wavelengths vary when it comes to energy level and pulse duration. These settings are to be determined by the attending physician during treatment.

Meanwhile, treatment equipment used for surgical procedures include the following:

- Diagnostic scopes
- Surgical caps, gowns, gloves, or glasses (for the surgical team)
- Gauze and drapes (for patients)

1.1.4 Life Support Equipment

As the name implies, life support equipment are those medical devices intended to maintain the bodily function of a patient. Without life support, it will be difficult for the patient's organ systems to function on their own. There are a variety of life support machines in the medical field today, such as the following:

- Heart-lung Machines – Also known as cardiopulmonary bypass (CB) devices, this type of equipment temporarily functions as the heart or lungs of a patient during surgery. It facilitates in the circulation of blood and oxygen throughout the patient's body. It is known as a form of extracorporeal circulation.
- Medical Ventilators – This type of device is designed to move breathable air in and out of the lungs. It is used on patients who have difficulty breathing, or who are incapable of delivering an adequate supply of oxygen throughout the body. There are two types of medical ventilators. One is hand-operated using a bag valve mask. The other is run and operated by a computer. You will find this machine used in intensive care unit patients or home care patients.

- Dialysis Machine – Dialysis is the method of removing excess solutes or toxins from the blood. It is used on people whose kidneys have been damaged and are incapable of performing these functions. It is a type of renal replacement therapy. Dialysis machines are essential for those who have kidney damage or lost kidney function.
- Incubators – An incubator is a medical apparatus used for neonatal intensive care. It is designed to mimic the environmental conditions suitable for newborn babies. It is often used in conjunction with a few other medical equipment such as an oxygen hood and ventilator.

1.1.5 Medical Laboratory Equipment

The use of medical laboratory equipment is often seen in medical clinics or diagnostic laboratories. These types of equipment are intended for the analysis of blood, urine, genes, and other biological material. Below are the most common examples of medical laboratory equipment used in the medical field?

- Blood gas analyzers
- Chemistry analyzers
- Blood collection supplies
- Electrolyte analyzers
- Differential counters
- Drug testing analyzers
- Coagulation analyzers
- Hematology analyzers
- Urinalysis analyzers
- Microbiological systems

As medical technology continues to develop, you can expect that there will be more types of medical equipment emerging. This is good news to patients who can expect quality medical care and diagnosis utilizing the latest in medical technology.

Self-check 1	Matching

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

A	B
1. Diagnostic Equipment	A. Chemistry analyzers
2 Medical Laboratory Equipment	B. Medical Ventilators
3 Life Support Equipment	C. Infusion Pumps
4 Durable Medical Equipment	D. X-ray machine
5 incubator	E. used for neonatal intensive care

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Date

Score = _____

Rating: _____

Information Sheet-2	Identifying biomedical equipment end user

2.1 end user

Users in this context are heterogynous group, basically comprising

- doctors,
- nurses
- Technicians.
- clinical engineers

With regard to the handling of equipment, the differences between these categories are not pronounced .the difference lies more in the social sector .in some cultures status consciously may not permit the training of technician together with medical doctors .further more cleaning of the equipment may not be culturally acceptable for relatively high ranking staff within a hospital. Circumstance like these must be taken into account, but in the majority of cases there is no need develop separate courses for different health staff

Self-check 2	Short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List medical equipment end user

Note: **Satisfactory rating - 8 points** **Unsatisfactory - below 8 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name: _____

Score = _____
Rating: _____

Information Sheet-3	Developing training plan for end-users.

3.1 The considerations for developing a training program are as follows:

1. **Needs assessment and learning objectives.** This part of the framework development asks you to consider what kind of training is needed in your organization. Once you have determined the training needed, you can set learning objectives to measure at the end of the training.
2. **Consideration of learning styles.** Making sure to teach to a variety of learning styles is important to development of training programs.
3. **Delivery mode.** What is the best way to get your message across? Is web-based training more appropriate, or should mentoring be used? Can vestibule training be used for a portion of the training while job shadowing be used for some of the training, too? Most training programs will include a variety of delivery methods.
4. **Budget.** How much money do you have to spend on this training?
5. **Delivery style.** Will the training be self-paced or instructor led? What kinds of discussions and interactivity can be developed in conjunction with this training?

6. **Audience.** Who will be part of this training? Do you have a mix of roles, such as accounting people and marketing people? What are the job responsibilities of these individuals, and how can you make the training relevant to their individual jobs?
7. **Content.** What needs to be taught? How will you sequence the information?
8. **Timelines.** How long will it take to develop the training? Is there a deadline for training to be completed?
9. **Communication.** How will employees know the training is available to them?
10. **Measuring effectiveness of training.** How will you know if your training worked? What ways will you use to measure this

Self-check 3	Matching

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

A	B
1. Content	A. How will employees know the training is available to them?
2. Audience	B. What is the best way to get your message across?
3. Delivery mode	C. What needs to be taught?
4. Learning styles	D. How much money do you have to spend on this training?
5 .Communication.	E. Making sure to teach to a variety of learning styles
6. Budget**.**	F. Who will be part of this training?

Note: **Satisfactory rating - 8 and 15 points Unsatisfactory - below 8and 15points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name: _____ Date:

Score = _____

Rating: _____

Information Sheet-4	Integrating training

4.1 Assess training needs:

The first step in developing a training program is to identify and assess needs. Employee training needs may already be established in the organization's strategic, human resources or individual development plans. If you're building the training program from scratch (without predetermined objectives) you'll need to conduct training needs assessments.

4.2 Set organizational training objectives:

The training needs assessments (organizational, task & individual) will identify any gaps in your current training initiatives and employee skill sets. These gaps should be analyzed and prioritized and turned into the organization's training objectives. The ultimate goal is to bridge the gap between current and desired performance through the development of a training program. At the employee level, the training should match the areas of improvement discovered through 360 degree evaluations.

4.3 Create training action plan:

The next step is to create a comprehensive action plan that includes learning theories, instructional design, content, materials and any other training elements. Resources and training delivery methods should also be detailed. While developing the program, the level of training and participants' learning styles need to also be considered. Many companies pilot their initiatives and gather feedback to make adjustments before launching the program company-wide.

4.4 Implement training initiatives:

The implementation phase is where the training program comes to life. Organizations need to decide whether training will be delivered in-house or externally coordinated. Program implementation includes the scheduling of training activities and organization of any related resources (facilities, equipment, etc.). The training program is then officially launched,

promoted and conducted. During training, participant progress should be monitored to ensure that the program is effective.

1. **4.5 Evaluate & revise training:**

As mentioned in the last segment, the training program should be continually monitored. At the end, the entire program should be evaluated to determine if it was successful and met training objectives. Feedback should be obtained from all stakeholders to determine program and instructor effectiveness and also knowledge or skill acquisition. Analyzing this feedback will allow the organization to identify any weaknesses in the program. At this point, the training program or action plan can be revised if objectives or expectations are not being met.

Self-check 4	Short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List steps of integrating training

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Information Sheet-5	submitting training plan

- The last steps of medical equipment end user is submitting the training for appropriate personnel with respect to their position
- According to the hospital management system the personal who receive the training plan and approve this plan may varies from hospital to hospital.
- As general the following personal are responsible to approve the submitted plan that submitted by the group that study the previous steps
    - ✓ Medical director
    - ✓ Human resource
    - ✓ Capacity building office
    - ✓ HTM working group
    - ✓ Finance bureau
    - ✓ Biomedical /clinical engineering department

Self-check -5	short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List personnel that are responsible to approve the submitted training plan

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

LG #28	LO #2 Assess training needs
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Determining assessment of methodology.
- Developing assessment tool.
- Collecting and analyzing data about the end-users.
- Identifying training needs

Responding unplanned events or conditions. This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Determine assessment of methodology.
- Develop assessment tool.
- Collect and analyze data about the end-users.
- Identify training needs

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 5.
3. Read the information written in the information “sheet 1, sheet 2, sheet 3, sheet 4,”
4. ” Accomplish the “Self-check 1, Self-check 2,” Self-check 3,slf check 4 in page -23 ,25, and 31
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1,” **in page -83.**

Information Sheet- 1	Determining need assessment methodology.

TRAINNING NEED ASSESSMENT

Training Needs Assessment" (TNA) is the method of determining if a training need exists and, if it does, what training is required to fill the gap. TNA seeks to identify accurately the levels of the present situation in the target surveys, interview, observation, secondary data and/or workshop. The gap between the present status and desired status may indicate problems that in turn can be translated into a training need

Training can reduce, if not eliminate, the gap, by equipping the participants with knowledge and skills and by encouraging them to build and enhance their capabilities. The data on the present status are vital to the evaluation or impact survey in the latter part of the training cycle. These shall serve as the baseline data. The following are some techniques for acquiring such data. These may be applied independently or in combination.

Manual (on (Training (Needs (Assessment

TNA is also the process of collecting information about an expressed or implied organizational need that could be met by conducting training. The need can be a performance that does not meet the current standard. It means that there is a prescribed or best way of doing a task and that variance from it is creating a problem. The TNA process helps the trainer and the person requesting training to specify the training need or performance deficiency. Assessments can be formal (using survey and interview techniques) or informal (ask in some questions of those involved).

Why do we need training?

Because training is a means to ensure that government officials have the knowledge and right skills to be able to do their work effectively and competently. Training may be needed when there is a gap between the desired performance, and the current performance, and the reason for that gap is lack of skill or knowledge. Training may only be able to resolve part of the problem. Thus we need to analyze the problem and find out whether training will be able to resolve it. If training is necessary, we also need to define the objective of the training and how it will help the staff member(s) become more effective. This process is called a Training Needs Assessment shown above or Training Needs Analysis. It is important to note that, despite many reasons to conduct training shown above, training may sometimes not be the only solution to a problem. There are many other means that impact on someone's ability to

do their work, as pointed out in the “Report on Training Needs Assessment” by PILAC. The following are other examples.

- Lack of skills or knowledge, or experience
- Not having the right equipment or resource
- Not being encouraged by managers and colleagues to do the right thing
- There are no standards or expectations that are set and communicated
- Bad workplace morale or conditions

Why do we need a Training Needs Assessment?

First, identify dissatisfaction with the current situation and desire for change as similarities among the requests. Each request implies that a gap or discrepancy exists between what is and what could be or should be. A learning or performance gap between the current and desired condition is called a need. TNA aims at the following situations.

- Solving a current problem
- Avoiding a past or current problem
- Creating or taking advantage of a future opportunity
- Providing learning, development or growth

The purpose of TNA is to answer some familiar questions: why, who, how, what, and when. The following are descriptions of the questions and what analysis can be done to answer them

Self-check 1	TRUE/FALSE

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. training Needs Assessment" (TNA) is the method of determining if a training need exists and, if it does, what training is required to fill the gap
2. TNA seeks to identify accurately the levels of only the present situation in the target group
3. Need of training is to identify dissatisfaction with the current situation and desire for change as similarities among the requests
4. TNA aims only Solving a current problem

Note: **Satisfactory rating - 8 and 15 points Unsatisfactory - below 8and 15points**

You can ask you teacher for the copy of the correct answers.

Answer

Score = _____
Rating: _____

Information Sheet- 2	Developing assessment tool.

2.1 Assessment tool.

Data collection and analysis are essential parts of developing assessment tools. The following table describes the most commonly used methods of data collection. TNA is optimized when a combination of data collection methods is used to analyze quantitative and qualitative data. Regardless of which methods are used to collect and analyze data, it is important to consider the reliability, validity and trustworthiness of the data.

Method	Concept
Structured Interview	❑ Quantitative research method commonly employed in survey research to ensure that each interviewee is presented with the same questions in the same order and that answers can be reliably aggregated and that comparisons can be made with confidence between sub-groups or between different survey periods. ❑ Interviewers read the questions exactly as they appear on the survey questionnaire. The choice of answers to the questions is often fixed (close-ended) in advance, though open-ended questions can also be included within a structured interview.
Semi-Structured Interview	❑ Unlike the structured interview, more general questions or topics. Relevant topics are initially identified and the possible relationship between these topics and the issues become the basis for more specific questions which do not need to be prepared in advance allowing both the interviewer and the person being interviewed the flexibility to probe for details or discuss issues. ❑ New questions can be brought up during the interview as a result of what the interviewee says, so the interview flows more like a conversation.
Observation	❑ Observation of working environment and performance of officials (office materials, communication tool, IT system, means of circulating the information)
Questionnaire Survey*	❑ A questionnaire is a survey instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. They are often designed for statistical analysis of the responses.
Focus Group discussion	❑ Qualitative research method whose purpose is to obtain in-depth information on ideas and perceptions of a group and also to be more than a question-answer interaction. ❑ A relatively small meeting (generally six to twelve participants) convened for a specific purpose under the direction of a facilitator, during which group members talk freely and spontaneously about a certain topic.
Workshop	❑ An educational seminar or series of meetings emphasizing interaction and exchanged of information among a usually small number of participants developing skill or common understanding through some types of application ❑ Discussion on verification of identified staff training needs in the returned TNA questionnaires and interview results

Self-check 2	True/false

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. Data collection and analysis are essential parts of developing assessment tools
2. TNA is optimized when a combination of data collection methods is used to analyze only quantitative
3. Regardless of which methods are used to collect and analyze data, it is important to consider the reliability, validity and trustworthiness of the data.

Note: **Satisfactory rating - 6 points** **Unsatisfactory – 6 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Information Sheet- 3	Collecting and analyzing data about the end-users.

2.1 Collecting data

The third step in TNA is to collect data through: i) reviewing documents on existing training (secondary data and information); and ii) conducting survey including interviews and observation at work.

Figure 1. steps of data collection

It is important to collect and review secondary data and information prior to conducting interview surveys.

Decide who will receive the questionnaire as part of planning your survey, you will decide whether to collect data from a sample (that is, a subgroup) of your target population and generalize the responses to the larger population or to collect data from all participants targeted by the survey.

Sampling is used when it is too expensive or time consuming to send a survey to all members of a group, so you send the survey to a portion of the group instead.

Random sampling means everyone in the population has an equal chance of being included in the sample.

For example, if you want to know how many licensed social workers in your state have access to online medical journals, you probably do not have to survey all end user. If you use random sampling procedures, you can assume (with some margin of error) that the percentage of all social workers in your state with access is fairly similar to the sample percentage. In that case, your sample provides adequate information at a lower cost compared with a census of the whole population.

With smaller groups, it is possible to send the survey to everyone. In this case, any information you summarize is a description of the group of respondents only.

2.2 Summarize and Analyze Your Data

2.2.1 Compile descriptive data

The first step in analyzing quantitative data is to summarize the responses using descriptive statistics that help identify the main features of data and discern any patterns. When you have a group of responses for one question on your survey, that group of responses is called a “response distribution” or a “distribution of scores.” Each question on your survey, except

open-ended ones, creates a distribution of scores. Descriptive statistics describe the characteristics of that distribution

2.2.2 Calculate measures of central tendency and dispersion

You also should determine the "most representative score" of a distribution. The most representative score is called the "measure of central tendency." Depending on the nature of your score distribution, you will choose among three measures

- **Mode**. The most frequent response.
- **Median.** The score that is in the middle of the distribution, with half of the scores above and half below. To find it, sort your distribution from highest to lowest ratings, then find the number that equally divides the distribution in half. (If you have an even number of scores, add the two most central scores and divide by two to calculate the median.)

• **Mean**. This is known as the "average" response in your distribution. It is computed by adding all responses and dividing by the number of respondents who answered the question. You also need to calculate the spread of your scores, so you can know "how typical" your measure of tendency is. We call these "measures of dispersion," the most frequently reported measures being range (the lowest and highest scores reported) and standard deviation (the "spread" of scores, with a higher standard deviation meaning a bigger spread of scores

Self-check 3	True/false

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. The third step in TNA is to collecting data
2. Mode known as the "average" response in your distribution
3. Measure Mode The most frequent response.
4. The most representative score is called the "measure of central tendency

5. ***Note:*** **Satisfactory rating - 4 points Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet- 4	Identifying training needs

4.1 training needs

Proper training is the backbone of any successful organization. Employees who receive the right training are more productive, efficient, and satisfied with their workplace experience. You'd be astounded at the ways that excellent training shapes the landscape of your office environment. If you want to provide superior training, start by making a checklist that addresses the direct needs of the individuals involved.

4.1 .1 Explore overall performance

Look at each section of your organization instead of the organization as a whole. Examine them, and assess which aspects are lacking, or performing below your desired standard. You'll want to refresh and improve all training, but identifying these key areas will show you where to place the biggest emphasis. Devote the majority of your time to these targeted areas and gently touch on the things that people seem to be doing well.

4.1.2 Compare yourself to similar organizations

What are they doing differently from you, and how is that helping them succeed? If you're seeing an enviable outcome from other organizations, you might want to jump aboard the same train. This may mean overhauling a lot of current policies and implementing new technology. When things change, everyone is going to need a training update.

4.1.3 Perform individual assessments

You may not have a lot of people doing the same work. Certain tasks may be delegated to very small groups, or even individuals. Measure the performance of these individuals to determine where their strengths and weaknesses lie. Training can boost productivity, but only if the training is tailored to the areas where productivity needs to be improved. You may find that some people need very specific training.

4.1.4 Consider your industry

Everyone undergoes some sort of basic training before starting a job, and some of that may even be required by law. Everything differs from industry to industry. How familiar are the members of your organization with the trends and standards within your industry? Try providing them with a bigger picture.

4.1.5 Different training programs for different roles

A file clerk doesn't need the same kind of training that an accountant needs. There are many different roles within your organization, and the people who fill them need to understand how you expect them to do their part. A training program needs to exist for each individual job. A one-size-fits-all approach will leave certain people lacking vital information, and this will cause problems down the road.

4.1.6 Train for common job requirements

Have you ever trained individuals for using software? Monitoring an anti-virus program? What about data entry? The tools they use and the small tasks they're required to perform comprise a significant part of their responsibilities. Though these things may seem routine, there's no use in creating complications by expecting people to figure them out on their own.

Particularly when it comes to matters surrounding IT and security concerns, you should never let people poke around and guess how they're expected to fulfill their duties. Always communicate with the individuals who do work for your organization. Ask them if they understand how things work, and take suggestions about how you can improve things. Keeping constant, open communication can help prevent training issues and misunderstandings before you begin to see their negative consequences, and encourage individuals to tell you where they need assistance**.**

Self-check 4	True/false /short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Proper training is the backbone of any successful organization
2. List steps to identify training needs
3. ***Note:*** **Satisfactory rating - 8 and 15 Unsatisfactory - below 8and 15points points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

LG #29	LO #3- Prepare training materials
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Developing course outline.
- Preparing time schedule.
- Determining types of training materials
- Preparing training materials.

Responding unplanned events or conditions. This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Develop course outline.
- Prepare time schedule.
- Determine types of training materials

- Prepare training materials.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 5.
3. Read the information written in the information “sheet 1, sheet 2, sheet 3, sheet 4,”
4. ” Accomplish the “Self-check 1, Self-check 2,” Self-check 3,slf check 4 in page -33 ,39, 41 and 43
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1,” in page -83.

Information Sheet- 1	Developing course outline.

1.1 course outline.

A good course outline allows trainer to assess the course for fit with their learning needs, clearly understand what is expected of them and how they will benefit from the instruction. There are many possible components to a course outline but a basic course outline is presented below and can be customized to work within various corporate training and continuing education situations.

Creating a course outline template is an efficient way to standardize course outlines and catalog details for future revisions or offerings. It is an integral part of a course proposal**.**

1.2 Course Outline Template

A course outline should include the following sections:

1. Course Name, Number, Credits and Description
2. Prerequisites/Co-requisites

3. Instructors Name, Contact Info and Bio
4. Course Schedule
5. Learning Outcomes
6. Content Breakdown by Session
7. Instructional Methods Used
8. Course Evaluation Process, Policies and Grading Scale
9. Classroom Rules/Code of Conduct Expectations
10. Course Materials

Self-check 1	short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. **List main course outline section**

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name: _____

Score = _____
Rating: _____

Information Sheet- 2	**Preparing time schedule**.

2.1 Plan Schedule

The three primary components of a course are the learning objectives, assessments and instructional strategies. Once these three components are identified, at least provisionally, the next task is to organize them into a coherent, dynamic whole. This involves:

- Deciding on a course structure
- Selecting a teaching strategy to support learning goals
- Creating a schedule

Deciding on a course structure

The course structure refers to the choice of topics and the organization and sequencing of course content. Remember that the choice of topics and their organization should always support the learning objectives for the course.

Topics

All trainers want and need their students to master course content and learn how to use that content in some way, a great many instructors devote their time to the first task and neglect the second. Focusing too much on coverage – i.e., including too many topics – can actually impede student learning by crowding out opportunities for students to practice *applying* the skills and knowledge they gain. It is important to determine a reasonable scope for your course, that includes essential content but which also provides opportunities for students to engage actively with this content so that deeper learning occurs.

To develop a reasonable set of topics, it recommends creating a list of all the content areas you could cover that are relevant to the subject of the course, and then “severely” paring

down the topics you have listed, distinguishing what you consider absolutely essential from the rest Build your course around these essential topics, choosing materials (books, articles, films, speakers, etc.) that will speak to these topics and help you accomplish your learning goals.

Organization and sequencing

There are many – often equally effective -- ways to organize a course to accomplish a particular set of objectives. For example, a course could be arranged in any one of the following ways: chronologically, from concrete to abstract (or vice versa), from theory to application (or vice versa), around a set of questions, around a set of practical problems or case studies, according to disciplinary classifications and categories, etc. However we choose to organize the course, the goal should be to create a structure that supports the learning objectives we have identified.

In general, courses should build towards greater complexity, starting with component pieces and working towards synthesis and integration.. Another way to think about it is that the course should tell a story and thus have a beginning (that introduces the key issues, tensions, and players), a middle (that develops and explores these issues), and an end (in which the various threads come together or relevant new questions are introduced).

Selecting a training strategy

A training strategy involves combining and sequencing a number of different instructional activities to help students accomplish the learning goals of the class. To determine an effective teaching strategy, think about what you want trainer to be able to *do* when they leave the course (e.g., apply certain formulas? create an interactive animation? debate the merits of particular policies? create a stage design that reflects a critical reading of an historical play?).

Having identified the broad learning objectives, work backwards, asking yourself: What particular skills and knowledge will students need in order to accomplish these objectives? Then address the following questions:

What kinds of activities will students need to engage in to acquire the necessary skills and knowledge?

How can you organize these activities to provide sufficient practice?

How can you sequence them so that skills build upon one another?

For example, if one of your course objectives is for students to be able to identify the key theoretical positions in a topic area, discuss them critically, and apply them to particular issues, the teaching strategy might combine lecture (to introduce the theories and their

proponents), discussion (to critique the theories and discuss their applications), and a writing assignment (to apply them to a specific problem or topic.) If one of the course objectives is for students to compare different approaches to theatrical costume design, then a teaching strategy might combine mini-lectures to identify key issues in costume design, student observations of different theatrical productions, group discussion, and an individual written assessment.

Creating a Schedule

After determining the main topics to be covered, the organizational scheme, and an appropriate teaching strategy for accomplishing our objectives, we must create a schedule for the course. Here it is important to gauge the amount of time necessary for the activities we have in mind, both in and outside of class time, and to map this structure onto the academic calendar.

While there is no easy formula for devising the course schedule, here are some things to think about:

Consider the time constraints of your particular course: obviously, a 3-hour class that meets once a week will pose different challenges than a 50-minute class that meets three times a week.

Spread assignments out to help students manage the workload and to avoid an unrealistic grading burden for yourself.

Provide sufficient time between assignments to give students feedback and allow them opportunities to incorporate it.

Take into account religious holidays and special events on campus that may affect student work.

Think about how interruptions (weekends, holidays, etc.) will affect the flow of your course (for example, you might not want to schedule a film for one class day and a discussion of it the next, if the viewing and discussion are separated by a week.)

Leave some unscheduled time in your course in case exciting, unanticipated opportunities present themselves or certain topics or activities take longer than expected.

Some strategies that instructors use to plan their course schedule include these:

Write all the dates of class meetings on a flipchart. Then write different assessments (homework, papers, presentations, etc.) you are considering on different colored post-its. Stick the post-its on the flipchart calendar and move them around until you find a good balance and distribution, taking into account the time students need to do the work, the time you need to mark and return it, and situational constraints like holidays.

Count the number of class days and create a grid with a box for each class day. Fill in each box with the activities you tentatively have in mind for that class day, taking into account the issues outlined above. Plot your assessments and due-dates so that are supported by your instructional strategies, reinforce your learning objectives, and fit reasonably within the rhythm and time constraints of the semester.

Create a grid with three columns. Write your topics in the first column, the instructional strategies and assessments (homework, discussions, group work, etc.) you are considering in the second, and the materials or resources (readings, films, slides, equipment, etc.) you will need for these instructional strategies and assessments in the third column. See where there are too few or too many activities and add/subtract/reassess as you go.

You'll notice that the instructors who employ these strategies revise and tweak their schedules as they plan until the schedule reflects their objectives for the course, supports the course structure and teaching strategy, sequences work logically, and distributes it realistically across the semester. Creating a good schedule can be time-consuming, but the thought and effort invested at this stage will both help you write your syllabus and prevent problems (e.g., time conflicts, student panic, grading bottle-necks) by helping the course run more smoothly and effectively.

Self-check 2	TRUE/ FALSE

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. The course structure refers to the choice of topics and the organization and sequencing of course content
2. A training strategy involves combining and sequencing a number of different instructional activities to help students accomplish the learning goals of the class
3. Providing sufficient time between assignments to give students feedback and allow them opportunities is best way to determine course schedule

Note: **Satisfactory rating – 3 points Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name: _____

Score = _____
Rating: _____

Information Sheet- 3	Determining types of training materials

Required training material

- Information; about the training required (background and needs assessment) and the training sources available.
- Training materials; appropriate to the piece of equipment to be studied
- Space suitable for carrying out the training in. Equipment to be practised on during the training courses.
- Test and calibration instruments in order to verify technical conditions and safety during training.
- Spare parts and materials appropriate for maintenance training.
- Supplies for operation (and user training), such as consumables, medical supplies, and cleaning materials.
- Manuals to refer to, such as the manufacturer's operator and service manuals.
- Test method and certificate a formal way of testing trainees and issuing them with a certificate at the end of the training course, as a quality control and motivating factor
- (Depending on the extent of the training).
- Recognition a formal way of ensuring that the additional skills attained by staff are
- Reflected in their promotion chances and job grades by the Human

  Resources Department.
- Additional expenses possible room hire, overnight accommodation, travel and subsistence, trainers' fees, visual aids, teaching equipment, etc.
- Records a system for keeping a record of the specific training that a staff member has received

Self-check 3	Short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1 list material required to forward end user training

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name

Score = _____

Rating: _____

Information Sheet- 4	Preparing training materials.

5.1 Strategies for Developing Training Materials

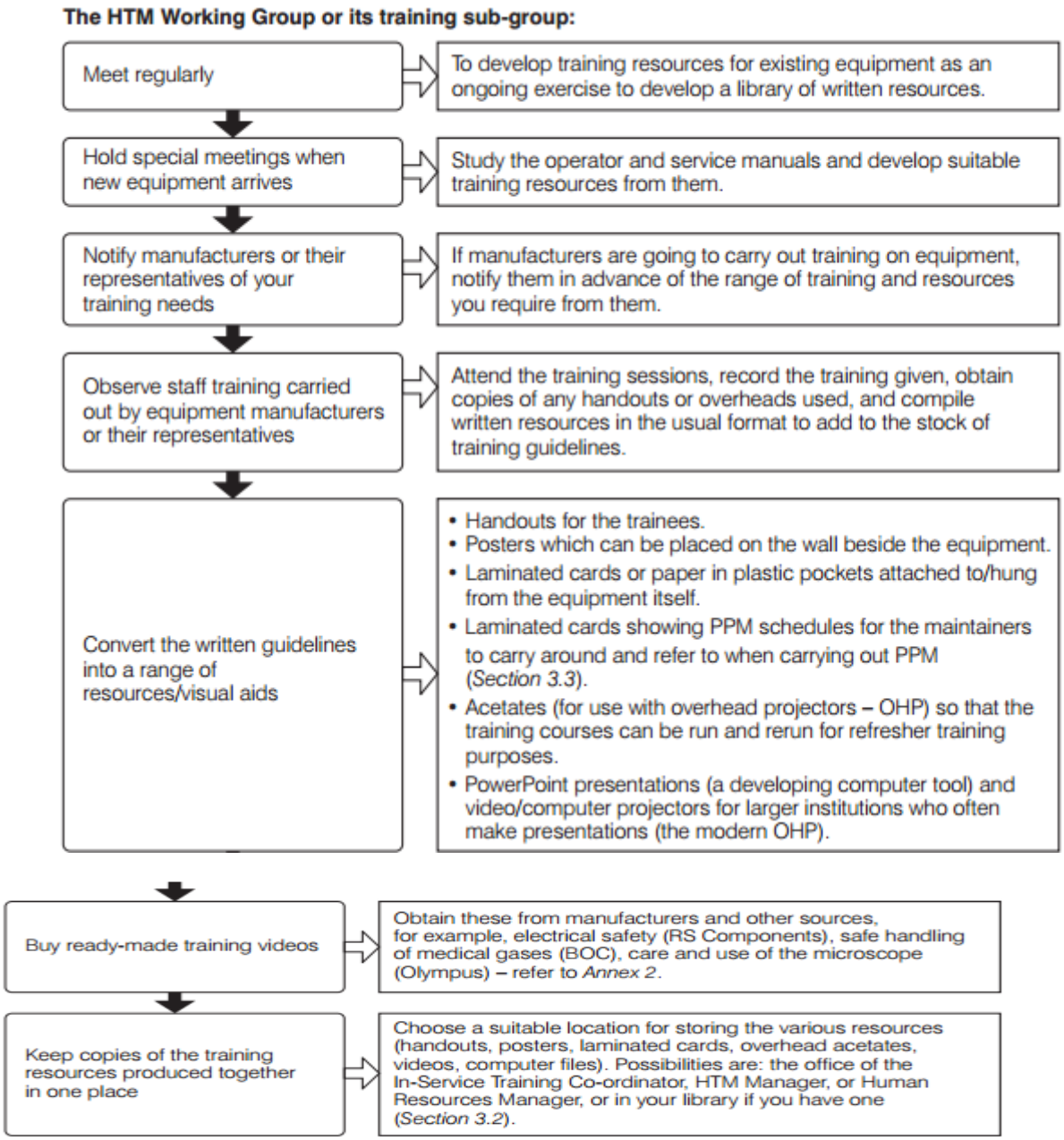

Figure 2. HTM working group

Self-check 4	Matching

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

A

1. Meet regularly
2. Hold special meetings when new equipment arrives

3. Notify manufacturers or their representatives of your training needs
4. Observe staff training carried out by equipment manufacturers or their representatives
5. Convert the written guidelines into a range of resources/visual aid

B

A. Study the operator and service manuals and develop suitable training resources from them**.**

B. Attend the training sessions, record the training given, obtain copies of any handouts or overheads used, and compile written resources in the usual format to add to the stock of training guidelines

C. manufacturers are going to carry out training on equipment, notify them in advance of the range of training and resources you require from them

D. To develop training resources for existing equipment as an ongoing exercise to develop a library of written resources.

E. Handouts for the trainees

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name

Score = _____
Rating: _____

LG #30	LO #4- Conduct training
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Making introduction to trainers.
- Introducing objective of training
- utilizing appropriate training methods and approaches
- assessing trainer
- evaluating the trainer and trainees

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, **upon completion of this Learning Guide, you will be able to**:

- Make introduction to trainers.
- Introduce objective of training
- Utilize appropriate training methods and approaches
- Assess trainer
- Evaluate the trainer and trainees

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, and Sheet 3” Sheet 4, Sheet 5, and Sheet 6
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 Self-check 4, Self-check 5, and Self-check 6” **in page 46, 48, 53, 57, 62 and 65** respectively.

Information Sheet-1	Making introduction to trainers.

1.1 introduction

Professionals in health and social care are personally accountable when they use medical devices and therefore must ensure that they have appropriate training. This procedure is to ensure all staffs are trained in the use of medical devices as deemed necessary by their line manager. An individual who uses the device in a way not intended, or against the instructions of the manufacturer may be liable for any consequences. This procedure is in compliance with CQC Fundamental Standards section C of Regulation 12: Safe Care and Treatment. This regulation states that persons providing care or treatment to service users should have the qualifications, competence, skills and experience to do so safely.

1.2 Baseline Assessment

Ward/Department Managers/Supervisors have the responsibility to ensure that all new clinical staff (including bank staffs and students in training) have received training on all medical devices relevant to their specific area.

- To identify which medical devices the staff member will use within their ward/department a baseline assessment will be undertaken using the Medical Equipment Competency Review form contained in the local induction pack (see enclosed Example of Medical Equipment Competency Review Form). Each ward/area/department has a list of commonly used equipment and this has been included on the form
- Once completed the form is returned, as directed in the Local Induction Pack, for recording on the Medical Device Training Database
- A training needs analysis will be developed by Medical Device Training team for each area to determine training requirements for staff in that area. This will form the basis for appropriate training and updates
- Ward/Departmental Managers to identify any training needs and notify the Medical Device Trainers who will coordinate/deliver the training

Self-check 1	True/false

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. medical director identify any training needs and notify the Medical Device Trainers who will coordinate/deliver the training
2. A training needs analysis will be developed by Medical Device Training team for each area
3. Professionals in health and social care are personally not accountable when they use medical devices
4. Medical device regulation states that persons providing care or treatment to service users should have the qualifications, competence, skills and experience to do so safely.

Note: **Satisfactory rating - 4** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Information Sheet-2	Introducing objective of training

2.1 Objectives

These objectives are to guide the user trainers on the day to day training and they are:

1. To ensure that health workers are able to utilize all the equipment in their facilities.
2. To make sure that the right equipment is used for the right purpose.
3. The health workers are able to identify all the faulty equipment and report to the medical technicians for repair.
4. To encourage all health workers to carry out equipment inventory regularly to enable them know what is available, what is faulty and what needs repair or replacement in their facilities.
5. To change the attitude of Health workers towards the safe use and care of medical equipment.

Self-check 2	Short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. objectives to guide the user trainers on the day to day training and they are:

Note: **Satisfactory rating - 4** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Information Sheet-3	Conducting the training

3.1 Training Trainers

The trainers who run the equipment training sessions are usually one or more of the following:

- Staff from the equipment manufacturer.
- Staff from the manufacturer's representative.
- Maintenance or clinical staff from other teams, workshops, health facilities, and health service providers who are knowledgeable about the equipment.
- Senior maintenance or clinical staff within your team, workshop, or health facility who were previously trained on the equipment or who have the necessary skills.
- Partners in technical cooperation projects, or staff from non-governmental organizations and charities.

If you don't currently have enough trainers, you can nominate staff who can be trained to become trainers. When maintainers are being trained at the time of commissioning new

equipment, it may be useful to select staff from among the trainees who you would like to become trainers. These individuals can then go on to train staff who could not attend the initial training sessions: for example, a technician at district level could be trained to teach artisans around the district.

The trainers will need to be taught sufficient skills to train their colleagues. They should be capable of running both formal and informal training sessions in order to pass on their skills in the operation, safety, care, and maintenance of equipment.

They will require training on the equipment concerned and can receive this either from the manufacturer, from other facilities where the equipment is in use, or from colleagues with the necessary experience.

3.2 Equipment Users

These are all the Health workers in the Health facilities e.g. nurses, doctors etc.

Roles

- To ensure that all medical equipment is being utilized properly without causing any malfunction or failure.
- To identify all the equipment in their units by name
- To identify faulty equipment and report to the immediate in charge or user trainers who will contact the medical Technician.
- To use the right equipment for the right purpose
- To have positive attitude towards proper use and care for medical equipment
- To carry out inventory keeping in their own units regularly without being reminded
- To keep all equipment manuals in a safe place

Note Not all Technicians can repair medical equipment so only inform either medical Technicians or Bio medical Engineers.

Partners

These are different partners who come to support the Health facilities. In case of equipment to be donated to the facilities, they need to ask the Hospital management on what type of equipment that is needed.

Organization Structure

At the central level, the ACHS (Curative) is responsible for User Training and he works hand in hand with the senior user trainers.

They monitor, supervise and support the User Training activities.

User trainers are responsible for training the equipment users and also carry out support supervision in their areas of operation

3.3 Training in Equipment use and Maintenance

Proper use of medical equipment is essential to maintain optimal performance of medical devices and preserve the safety of patients as well as the staff operating the devices. Given the variation in technical characteristics of medical equipment, all clinical staff should be trained to operate each medical device that they use. The MEMU is responsible for overseeing all user training for medical devices, whether in-service or conducted by suppliers/external parties.

Training should be conducted at various times throughout a staff member's career:

• Induction training – when staff are newly placed in post, move to a new department or facility, or to a new location with different responsibilities

• Training at the commissioning of equipment – when new equipment first arrives

• Refresher training – to update and renew skills throughout the working life of staff

Building the capacity of biomedical engineers, technologists, and technicians is

Always one of the major activities of the Biomedical Engineering Directorate/ case team. This can be realized through regular short-term training programs, Supplier Company's training, and formal credit programs in higher education institutions, local and abroad. All such training programs are accompanied by certifications.

The hospital plans annually at least one-week long in-house refresher training program for its staffs. Participation in such refresher programs is mandatory and is part of the annual performance evaluation.

User training should cover:

- Equipment capabilities
- Purpose and capabilities of device
- Awareness of different models and operational differences
- Awareness of the expected life of medical device and need for replacement
- Knowledge of where/how to access user manuals and receive equipment updates

Operating procedures

- How to assemble the device and connect accessories
- How to operate the device effectively and safely
- How to link device to patient safely, causing minimal discomfort to patient
- How to set/change controls
- Protocol for equipment failure
- How to recognize malfunction (or correct if possible)
- Who to contact to report damage and adverse incidents and to do so promptly

Emergency and safety procedures

- How to safely shut down/dissemble
- How to clean/decontaminate device and maintain
- equipment in good operating condition
- Basic safety protocol:
- Always visually inspect equipment before each use.

- Check for signs of damage or incorrect settings

Self-check 3	Multiple choice

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. The trainers who run the equipment training sessions are usually
   A. Staff from the equipment manufacturer.
   B. Staff from the manufacturer's representative.
   C. Maintenance or clinical staff from other teams
   D. All
2. User training should cover:
   A. Equipment capabilities
   B. Purpose and capabilities of device
   C. Awareness of different models
   D. all
3. ---------- to update and renew skills throughout the working life of staff
   A. Training at the commissioning of equipment
   B. Refresher training
   C. induction training
   D. all
4. Which of the following is role of equipment user
   A. identify all the equipment in their units by name
   B. use the right equipment for the right purpose
   C. keep all equipment manuals in a safe place
   D. All

5. Proper use of medical equipment is essential to maintain optimal performance of medical devices

   A. true B. false

Note: **Satisfactory rating – 5 Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Information Sheet-4	utilizing appropriate training methods and approaches

Training For the safety of the patient and the user, proper training is critical for both the user and the technical staff. The technical staff and the clinical engineering department manager have dual responsibility for ensuring that the technical personnel as well as the clinical users are informed, trained and versed on their specific responsibilities. Training and education is not a one-time activity but a continual process. Enabling staff to see that learning is important and a constant feature of their job will improve reliability and success in future problem solving.

Training of technical personnel can be provided inside the health-care organization through: • Self-study:

- Reading the equipment service and training manuals;
- using additional self-study materials provided by the manufacturer;
- Using materials provided by a third party.

One-to-one training provided by a more experienced person from inside the organization. This may be a clinician teaching biomedical equipment technicians how the device works, for example, or a technician who is familiar with the device guiding others about maintenance and operation.

• The biomedical equipment technician taking part in a education class for nurses or other clinical users to learn about the operation of the equipment.

• The clinical engineering department bringing in a specialized outside trainer to teach staff about maintenance of a particular piece or type of equipment.

• The clinical engineering department bringing in one of the manufacturer's trainers to present to biomedical equipment technicians about maintenance and operation. Or training can take place outside the organization at:

• Third-party training programs designed to explain several models of a specific technology.

• Manufacturer's training programs specifically designed for equipment technicians.

The methods of training suggested above, progress from the least expensive to the most expensive to implement. So depending on hospital resources, local availability of information sources and the ability to coordinate with other hospitals who might have technicians to train as well, the hospital can choose a methodology that best matches their resources. It should be noted however that the most effective training methods for sophisticated equipment are the more expensive options. The most sophisticated equipment in hospital settings consists of computer based multi-component systems.

Most of the performance inspection and verification of this equipment is performed by software-based inspection systems built into the equipment itself. Obtaining access to the computer codes and understanding how to maintain this equipment may only come with training provided by the manufacturer or vendor for a fee. If the hospital has developed a competent staff of biomedical equipment technicians, service training by the vendor is a good investment as it enables the hospital to eliminate vendor-related costs and may also lead to the hospital being able to assume repair responsibilities.

The two basic methods of training are "**training on the job**" and "**training off the job":**

1. **Training on the Job**

"Training on the job" aims to teach the technical content of a job. It consists of the job being demonstrated (often in stages) and then undertaken by the trainee under supervision. Since the employee is trained whilst she/he is doing her/his job, her/his technical knowledge will be improved.

"Training on the job" may be supplemented by training manuals which are expertly written documents.

They clearly show the stages in a work process. They are used by the learner and instructor. Because of the expertise employed in compiling it, a manual gives an efficient method of training

2. **Training off the Job**

In "Training off the job" the employee is sent to a training institution where special courses are held. In these courses mainly theoretical knowledge is being taught. After the course the employee must implement the theory that was learnt on the job. This may be difficult, because often the facts are different from the theory. Additional difficulties may occur which have not been taught in the course.

Since a good implementation in "Training off the job" usually will be difficult, you may think that this training method is disadvantageous compared to "Training on the job". "Training off

the job" offers an advantage as well. When participating a training course in an institution, the employee can focus all her/his concentration on the course. Whereas by "Training on the job" she/he may be disturbed by daily work or colleagues. Thus, we cannot say which of these two methods the best one is. Which method should be chosen depends on the type of work that should be trained and on the work situation. In addition, it must be checked whether the training institutions offer suitable courses.

No matter which method is taken, the aim always must be to develop the staff's skills in order to keep competitive. Since the development of techniques is a continuous process, you should never stop training your staff.

In the following sections we are concentrating on "on-the-job" training, since this has proved to be a cost-effective and widely accepted method in the field of equipment handling and maintenance.

ON-THE-JOB TRAINING

This is one of the most important methods of training for all types of work whether on the shop floor or in the office. The newcomer is asked to observe and then to carry out the work under supervision. If necessary, a job is broken down into elements and each of these is taught before the trainee is expected to take other work.

Although all types of work can be covered, the method is best when dealing with routine work which takes a relatively short time to learn. When a job is complex and involves the exercise of judgment and making decision, both theory and practice may be necessary.

With on-the-job training, there is need for properly trained instructors, otherwise an inefficient instructor can produce a number of inefficient "off spring" or people.

Techniques available can be divided into three areas:

1. Demonstration- Telling or showing a trainee how to do a job and then allowing her/him to get on with it. This is the most common and effective method as long as it is done properly, i.e. by a properly trained instructor.
2. Coaching- in which counselling takes place usually between a manager and his subordinate and preferably based on a performance review.
3. Job rotation (Planned Experience) in which staff experience is broadened by them being moved from job to job. Here is learning by doing the best way as long as the sequence of experience is properly planned and controlled.

Self-check -4	True/ false

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. **In "**Training on the job" aims the employee is sent to a training institution where special courses are held.
2. Coaching telling or showing a trainee how to do a job and then allowing her/him to get on with it
3. "Training on the job" may be supplemented by training manuals which are expertly written documents
4. Training and education is a one-time activity but not a continual process

Note: **Satisfactory rating - 4 points** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer

Score = _____

Rating: _____

Information sheet 5	assessing trainer

5.1 assessing trainer

Before beginning the training program the trainer should learn about the trainees. He should know who they are, their age, where do they come from, what work do they do and if they own animals, what form of schooling have they had. He will need to discover what the trainees can already do and what they know about livestock and animal health care. He will also need to determine if they are physically able to do the work expected of them and do not suffer from any illnesses which could be passed on to other trainees

Encouraging the trainees to talk about themselves and their background in the first training sessions (the orientation period) is very important. It helps the trainer discover more about the trainees but also allows the trainees to share and compare their experiences. From this the trainer will learn not only the background of each individual but also what the trainees expect from the program. The trainer may find that because of the extent of their rural or nomadic background some individuals are naturally more opinionated, and perhaps argumentative, than others. The trainer should not try to argue the point with such individuals, but having identified them, he will need to slowly change their opinions through the course of the program by demonstration

During the first sessions it is also necessary for the trainer to discover the extent of the trainees reading and writing skills. It can be the case that attendance at school may not necessarily have resulted in the development of these skills. Proof of these skills will be needed and the trainer will need to incorporate into the first sessions a means of testing individuals for these skills. The trainer may decide on a straight test for these skills, but it is also possible to judge the trainee's ability by participation in group sessions.

The trainer should know exactly what areas the trainees need training in and he will need to make it clear exactly what the trainees will be expected to learn. At the beginning of each unit, in this book, are a number of **Learning objectives** which state what the trainee is expected to know, or be able to do, after completing the unit. The trainer and the veterinary service may decide to use other learning objectives if it is deemed necessary for additions or deletions to be made to the program to meet with local requirements.

The trainer will need to arrange the means by which trainees can practice the skills they are expected to develop. It will be necessary to arrange training exercises wherein the student can learn to do what the learning objective describes. Trainees must be given repeated opportunities to practice the techniques. It is often difficult to obtain animals for demonstrations. Animals can be bought in the market, used in training, and then resold. Cooperating farmers may be happy to let trainees learn and practice on their animals.

The conditions of learning

In order to facilitate the running of a training program the trainer will need to carefully plan his teaching, practical arrangements and facilities. In doing this he should consider some relevant points.

The trainer should encourage the trainees to discuss the various practices which are carried out in their communities. He should discuss them and praise those which are useful. He will then need to demonstrate the benefit of the methods he is expecting them to learn and encourage the trainees, through practice and discussion, to adopt the new methods. Trainees can learn tasks only if they are given the opportunity to practice them repeatedly while under supervision. The trainer must therefore be skilled in this form of training. It is essential that the trainer and the organization or institution providing the training arranges the means by which trainees have the opportunity to learn in this way. The training program contains an element of work which will involve a certain amount of straight forward classroom teaching, but the overall emphasis is on practical experience.

5.2 Trainer Observation Assessment Form

While observing the training session, tick the box that best represents the Trainer's performance in each area, using the columns, as outlined below:

	Requires Further Evidence Yes	Yes
Tick the box in the column titled 'Requires Further Evidence', if you are unsure if the Trainer has provided sufficient evidence to fully satisfy the criteria	☐	☐
Tick the box in the column titled 'Yes', if you are fully satisfied that the Trainer has meet the criteria specified	☐	☐

Trainer Name: _____

Course: ---------- Date: ----------

Commencing Time----------: Finish Time: _____ Total Time: ----------

1. INTRODUCTION Did the Trainer	requires Further Evidence	Yes
• Create an interest in learning?		
• Put the Participants at ease?		
• The lesson, main points and/or purpose, clearly?		
• State the learning outcomes clearly?		
• State the assessment (or performance) criteria and assessment methods clearly?		
• Explain how the information is relevant to their jobs/role/function?		
• State any safety requirements clearly (if applicable)?		
• check current knowledge/experience		
Comments:		
2. BODY Did the Trainer:		
Follow the lesson plan as per the Training Resources / course manual?		
2a. Skills Session (if applicable)		
• Give a short overview and Explanation of the skill?		
• Demonstrate the skill, using stages and emphasizing key points?		
• Supervise and observe participants as they Practice the skill?		
• Ask Questions, checking for correct techniques and identifying faults		
• allow sufficient time / opportunities to practice		

• Give constructive feedback and positive re-enforcement during practice?		
• 2b. Knowledge Session (if applicable)		
• Follow the lesson plan as per the Training Resources / course manual?		
• Summarize the main points of the whole session?		
• Link the training to the on-the-job requirements?		
• Allow time for Participants to ask final questions / clarify uncertainties?		
Comments:		

Table 1. Trainer Observation Assessment Form

Self-check 5	True/false

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. Before beginning the training program the trainer should learn about the trainees
2. In order to facilitate the running of a training program the trainer will need to carefully plan his teaching,

3. The trainer should know exactly what areas the trainees need training in and he will need to make it clear exactly what the trainees will be expected to learn
4. The training program contains an element of work which will involve a certain amount of straight forward classroom teaching

Note: **Satisfactory rating – 4 points** **Unsatisfactory – below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer

Score = _____
Rating: _____

Information sheet 6	evaluating the trainer and trainees

6.1 Evaluation

Evaluating the performance of trainees and the success of the training program

Trainees will be continually assessed during the training program to determine any problems and ensure that they are given every opportunity to develop the required skills. At the same time identification of problems encountered by the trainee will indicate weaknesses in the training program and/or the ability of the trainer to implement the program. All tests used to assess trainees' abilities must be relevant and reliable. That is, tests should measure exactly what it is required, e.g. how much the trainee knows about a problem and what he can do

about it. The test should also be objective and different independent examiners should agree on what is a satisfactory answer.

When the trainees are at work in their community, monitoring their work will indicate:

- If what they learned is appropriate to their work.
- If there are any problems for which they have not been trained.
- If PAHCWs are working with interest and satisfaction.
- Whether PAHCW's continue in their work.
- If the community is satisfied with the services they offer.

The information gained by this can then be used to determine whether or not it is necessary to alter the training program in any way. It will also determine what continued support the individual PAHCW will require.

What Is a Training Evaluation Form?

Training evaluation form is a questionnaire to establish the quality and comprehensiveness of a training session from an attendant's perspective. Gathering of participants' feedback is imperative and this business document pledges to streamline the whole process.

This simple business-oriented document allows you to accurately collect responses from your delegates after they have participated in a training occasion. Essentially, training evaluation form captures both positive and negative aspects of a training event thus enabling you to identify elements that can be enhanced and how to improve them.

After-training evaluation is an essential business aspect that helps improve the overall relevancy of future training exercises. Training evaluation enables you to establish the quality of the content/trainer consequently highlighting all the weak points.

- It allows you to pinpoint possible techniques on how to better your training
- It helps you in determining the relevancy of the specific training to your enterprise's goals
- It provides an avenue to reveal the real value of the training sessions

Professional Guide on How to Create an Impressive Training Evaluation Form

First and foremost, before you start mapping together the various elements of a training evaluation form, you need to have a clear understanding of the key aspects that you are looking forward to accessing from the whole event.

Generally, a typical form should include:

- Title of the event
- Date when the event was held
- Place where the training event was held
- Name of the trainers/instructors
- An in-depth questionnaire
- Suggestion box

Self-check 6	Multiple choice

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. When the trainees are at work in their community, monitoring their work will indicate
   A. If what they learned is appropriate to their work.
   B. if there are any problems for which they have not been trained
   C. If the community is satisfied with the services they offer.
   D. All

2. Training evaluation enables you to establish the quality of the content/trainer consequently highlighting all the weak points which include
   A. Title of the event
   B. Date when the event was held

C. Place where the training event was held

D. all

3. Which of the following is not purpose of evaluation

A. It allows you to pinpoint possible techniques on how to better your training

B. It helps you in determining the relevancy of the specific training to your enterprise's goals

C. It provides an avenue to reveal the real value of the training sessions

D. all

Note: **Satisfactory rating – 3 points** **Unsatisfactory - below 3 points**

You can ask you teacher for the copy of the correct answers.

Answer

Score = _____

Rating: _____

LG #31	LO #5 - Evaluate training outcomes
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Determining evaluation methodology.
- Developing evaluation tools.
- Collecting data from the target group
- Analyzing data.
- Interpreting analysis output.
- Recording evaluation report

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, **upon completion of this Learning Guide, you will be able to**:

- Determine evaluation methodology.

- Develop evaluation tools.
- Collect data from the target group
- Analyze data.
- Interpret analysis output.
- Record evaluation report

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4, Sheet 5, Sheet 6
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, and Self-check 4, Self-check 5, and Self-check 6 in **page 70, 79, 85, 88, 93 and 95** respectively.

Information Sheet-1	Determining evaluation methodology.

1.1 Basis of Training Evaluation

Most of the evaluation methods and steps are the outcomes of Kirkpatrick’s Model, which makes use of reaction, learning, behavior, and results as its basic categories on which the eye is needed to be kept. Reaction deals with the response of the participant regarding whether they liked the training course or not and if they did, then which part of it was the most interesting one and if not, then what’s the reason.

Learning deals with the degree to which the participants gained the knowledge and the rate of gain. Behavior involves the checking of the level of the application of the skills, whereas, results deal with the effect of the skills and knowledge on the success of the organization

1.2 Training Evaluation Methods

Following are the methods of training evaluation:

Satisfaction and Participant reaction

Satisfaction evaluation is the most basic measure for assessing the success rate of any training. For the purpose, the trainer, usually, hands out a survey at the end of the course to test the reaction of the participants. Most of the time, it covers common questions like whether the participants enjoyed the training or did they like the trainer.

Moreover, would they want him or her back, in case any other training program is initiated, or do they feel as if it was a loss of their time? Generally, the training evaluation ends here, since this method answers nearly all of the expectations, but still, if someone likes to dig deeper, then the rest of the methods can also do the job.

Knowledge Acquisition

Knowledge acquisition is the second level of the training evaluation and involves the examination as the attachment of the training course to check how much the participants have learned from the training course. It is a fact that most of the participants take training seriously only if they know that they are required to demonstrate the concepts that they have learned during the training.

In this method, participants are supposed to take the exam, after the training. The instructors or the trainers check and grade the responses, and share the results with the students as well as the training managers. This is done so that any gaps in the expected and acquired knowledge can be quickly sewn up.

A reliable and valid examination, as the training ends, can help in determining if the participant has understood and learned the concept or not. It can point out the participants that did not gain anything from training, leaving even further room for the support those who did. Furthermore, it can highlight areas that might need additional coaching or further training.

Behavioral Application

The third method of evaluation deals with the behavioral application of their newly acquired skills. It also involves monitoring the changing behaviors as the skills and knowledge are applied to the tasks. Even though the first method of training evaluation, satisfaction

assessment, is sufficient in most of the cases, but whenever the method of behavioral application is needed, it is used with the combination of the first two.

This method demonstrates the level to which the participants apply their newly acquired knowledge in their real life and real-world problems. This provides crystal clear evidence of who is applying the knowledge, where the knowledge is being applied and for what purposes. This can assist the management to avoid any misapplications.

For example, a company that initiates a course for increasing the telephone conversion rates can conduct a particular number of mystery calls before starting the training. This response can be recorded and graded in accordance with the objectives of the course.

After the training, the same company can again conduct that particular number of mystery calls and can compare their results with those before the training and measure the effectiveness of the training.

1.3 Stages of Training Evaluation

Training evaluation is normally done in five stages while keeping an eye on all of the internal and external factors that could alter the expectations and results.

Describing the outputs

First of all, the output in the form of descriptive data is presented before the participants of the current batch who are going to take the course. This includes previous achievements recorded in the various forms like charts, graphs, etc. as well as demographic data.

Pre-training Assessment.In this step, the experiences with previous batches, along with the information about what they achieved after they took the course, are revealed to the participants of the current batch. This then leads the descriptive data like expected outputs for the current batch, syllabus, learning needs and anything else that can come handy, later on.

Post-Assessment (reactions) .This deals with the reaction of the participants to the training experience and involves a lot of factors like the formats used by the instructor for instructional purposes, methods for teaching, learning environment and satisfaction towards the instructors and the course, itself.

Post-Assessment (learning) The fourth step towards training evaluation deals with the self-assessment of the level of the gained knowledge and skills, along with their points of application and the effects caused by the application of these skills.

Following-up.The final step involves the time to time assessment of the training program so that it generates the expected results without dwindling or interruptions. This is done so that the participants of the course could get the feel as they are getting trained by the best in the whole market.

Self-check 1	multiple choice

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Most of the evaluation methods and steps are the outcomes of

   A. kirkpatis model
   B. Phillips ROI
   C. CIPP **evaluation**
   D. All

2. Learning deals with the degree to which the participants gained the knowledge and the rate of gain.

   A.TRUE B.FALSE

3. The fourth step towards training evaluation deals with

   A. Post-Assessment (learning
   B. Following-up
   C. Pre-training Assessment
   D. Describing the outputs

4. ----------Demonstrates the level to which the participants apply their newly acquired knowledge in their real life and real-world problems.

   A. Post-Assessment (learning
   B. Behavioral Application
   C. Pre-training Assessment
   D. Describing the outputs

Note: **Satisfactory rating – 4 points** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Information Sheet-2	Developing evaluation tools.

2.1 Select the appropriate training evaluation techniques

When it comes to the evaluation of training programs, it's best to start at the beginning. So before you decide what to measure, or how to measure it, choose the evaluation technique that's most helpful for your needs.

Not sure which training evaluation techniques are on the menu? Here are some of the most popular methods used today

What are the methods of training evaluation?

There's a long (and we mean long!) list of training evaluation techniques to choose from, and this can be overwhelming. But there are five techniques that are most often trusted by companies today. Some of these techniques are referred to as models, or training evaluation methods, and we'll use these terms interchangeably.

- Kirkpatrick's Four-level Training Evaluation Model
- The Phillips ROI Model
- Kaufman's Five Levels of Evaluation
- Anderson's Model of Learning Evaluation
- Summative vs Formative Evaluation

- Kirkpatrick's Four-level Training Evaluation Model

This method of evaluating training programs might be one of the oldest, but it's still one of the well-loved. Why? Because it breaks the evaluation process down into 4 simple levels – or rather, steps. Here's how it works:

Step 1: Evaluate learners' reactions to training. This is commonly measured after training. Ask learners to complete a survey about their overall satisfaction with the learning experience.

Step 2: Measure what was learned during training. Use assessments to measure how much knowledge and skills have changed from before to after training.

Step 3: Assess whether or not (and how much) behavior has changed as a result of training. The best way to measure behavior change is through workplace observations and comparing 360-degree reviews from pre- and post-training.

Step 4: The final and most important step is to evaluate the impact of your employee training program on business results. Here, it's common to measure results like productivity, quality, efficiency, and customer satisfaction ratings.

In modern times, professionals have suggested that this process should actually be reversed. After all, step 4 is the most important one. If you agree with this approach, start by identifying the results you want to achieve, and work backward from there.

Whichever direction you choose to apply the steps toward, the eLearning industry has come to rely on Kirkpatrick's model for good reason. Its logical, staged approach is easy to apply, and once the evaluation is complete, you'll have a deep and wide understanding of employee learning during training.

Determine what you'll measure when evaluating your employee training program

Before you evaluate the effectiveness of your employee training program, you need to decide what the indicators of "effectiveness" are. Is training a success when employees become better at their jobs? Or is a happier, healthier company culture a sign that training is working? Is it, maybe, both?

The point is, you'll probably want to include more than one measure of training effectiveness. The more measures you include, the more information you'll have to help you improve your program.

Wondering where to start? Pick any or all of the popular training effectiveness measures below, and you'll be on the right track.

New skills and knowledge

When it comes to learning, training is the pillar, right? This makes the acquisition of new skills and knowledge one of the top measures of training effectiveness.

The measure of knowledge and skills development is sometimes referred to as 'learning performance', because it relates to an employee's performance as a learner, rather than their performance on the job. There are lots of easy ways to evaluate learner performance using a learning management system (LMS), but we'll discuss those in the next section of this article.

Learning experience

One measure of training effectiveness that's often overlooked, even when using the best types of training evaluation methods, is the learning experience. Why does this matter? Because when the learning experience is poor, employees are less likely to engage with training content, which means that they're less likely to learn the skills that will make them better at their jobs.

This, of course, is a big problem. In fact, it could result in loads of time and resources being wasted on a training program that never achieved its objectives. So, be sure to measure employees' perceptions of training delivery and content. Their feedback could be one of the best ways to measure training effectiveness, offering the best tips for improving your training.

Employee happiness

Did you know that for many employees, learning is the number one reason they feel happy at work? This is because learning helps employees to grow and develop, and often opens up new career opportunities, too. Wouldn't that make you happy?

And the great thing about happy employees is that they tend to work harder, stay committed for longer, and produce better results. So, while employee happiness might sound like a

strange indicator at first, it's actually one of the best results you can hope to see for your business.

Cultural impact

If you've never considered measuring the impact of training on your company's culture, it's time to start. Culture is the special ingredient that makes your business unique in a highly competitive world. So, you need to protect it with training that fosters workplace norms and values that are good for business.

When you deliver employee onboarding training, sensitivity training, or anything else that might impact culture, make sure to evaluate success based on culture. You can do this by looking for changes in the number of HR complaints (for example, harassment) after training, or assessing peer review scores for teamwork and positive attitudes.

Efficiency impact

So far we've mentioned four measures to use when you evaluate the impact of your employee training program, but none of them are business results. So, for this next measure we'll look at the impact of training on the efficiency of employees or teams.

Efficiency can be measured in different ways depending on your industry and the specific department you're training. For example, a manufacturing company might train their assembly line staff on new equipment, and then measure how many more units can be completed per day. On the other hand, an online tech business could measure how many tickets their customer support team closes after completing a training program.

Financial impact

Finally, it's crucial to evaluate the real impact of a company's employee training program on its financial position. The real economic impact of your training can be measured by changes in revenue and profit.

When training is successful, and all the measures of training effectiveness you use show positive results, then you should see an increase in sales and income, or a reduction in costs – or both! When it's both, you'll certainly also benefit from a rise in profits.

Choose the right training evaluation tools

You wouldn't measure length with a thermometer, right? So, before you start collecting information about the results of your training, make sure that you have the right tools for the job. Here are some of the most common training evaluation tools to choose from. Feel free to use more than just one to measure training effectiveness and track employee training.

Observations

This is the process of observing employees as they complete a task or process, or engage in a team activity. Often, the observer will use a journal to record what they see (it's true, even the best evaluators can't remember everything!).

There are many advantages to using observation as a training evaluation tool. You get to observe learning and behavior changes in a real workplace setting, and it costs nothing more than the observer's time. It also tends to be more accurate than self-report questionnaires which can be biased, or influenced by poor memory.

Still, this tool has some downsides. First, you need to find someone objective and knowledgeable with enough time on their hands to watch each employee for an hour or more. Then, even if you find an observer, there's the risk that employee behavior will change simply because they know they're being watched. This can skew the results.

Sometimes, though, observation is the best tool. This is especially true when behavior changes aren't easy to measure quantitatively. observing an employee's creative ideas and input during meetings is a good solution.

Tests

Tests are a great way to measure changes in knowledge and skills, and they come in all shapes and sizes. Written assignments can be time-consuming to grade, but luckily the right LMS will give you the tools to create automatically-graded quizzes that are fun and interactive, too.

Perhaps the best part about tests is that you can measure a specific skill or knowledge area without the distraction of being observed. For example, you could measure a medical sales rep's understanding of a new product with a few multiple-choice questions completed in a private and quiet environment. Plus, once you've set up a quiz on your LMS, you don't have to invest any more time into this tool.

But there's a catch. Tests usually don't measure knowledge and skills in the same environment in which they'll be used – the workplace, that is. So you won't know whether an employee is able to apply what they've learned when there are other distractions and pressures at play.

It's also worth mentioning that tests aren't the best measure for skills like persuasion, which are better assessed in practice (think role-plays). And when it comes to skills for high-risk jobs, like pilots and surgeons, tests aren't enough on their own. More realistic assessments, like simulations, are necessary, too.

Surveys

Perhaps one of the most common training evaluation tools and techniques used today is the survey. A survey, or training evaluation questionnaire, collects data through a series of questions, usually in the form of multiple choice.

Why are surveys so popular? Probably because they're highly efficient! You can design one survey, and send it out to millions of employees at the click of a button. If your survey is delivered via your employee training software, it gets even better, because you can access the results as an easy-to-interpret and downloadable report.

There's just one important limitation that you should know about: not many people like questionnaires! Sadly, surveys get an average response rate of 30% to 40%. So it's important to explain to employees that surveys help you improve training, and that you really do want to hear their feedback.

Because surveys ask for people's perceptions and opinions, rather than hard data, this tool is best suited to measuring how successful the learning experience was. You can ask employees what they liked about training, whether the platform was easy to use, and if the content was useful to improving their work.

Interviews

Interviews can be conducted face-to-face or online. But either way, they're as effective as questionnaires – and even more so. Why? Because not only can you ask employees a set of questions, but you can answer their questions and delve deeper into their responses, too. This flexibility often means that you get more valuable and detailed information from employees about their training.

Unfortunately, the same flexibility can result in a few problems for this evaluation tool. Each interview has to be conducted separately, which means that you lose valuable time that both the employee and the interviewer could be using to get work done. Plus, if each interview includes slightly different questions, it can become tricky to compare or summarize results.

Still, if you're exploring the reasons behind other results, this is the tool to do it. For example, if most employees rate the learning experience poorly on a questionnaire, then interviews could help you find out why. Or, if they rate the learning experience favorably, but don't improve on-the-job performance, you could use interviews to identify the reason for this gap.

Focus groups

Focus groups are carefully facilitated discussions among a small group of employees who all completed the same training. These are great tools for exploring what employees think and feel about training, and to get suggestions for future improvements.

Of course, focus groups are a little less time-consuming than interviews, because you can question a number of people at the same time. A group dialogue can also lead to deeper conversations about topics that might not have been explored in a one-to-one setting.

This makes interviews a particularly effective way to unpack obstacles to training success, and to explore ideas for improvement. Just watch out for group conflict or any other dynamics that could damage your ability to gather constructive information about training.

Performance records

If training doesn't improve job performance, it isn't working. So, performance records are surely an important measure to include in any training evaluation. The performance records you choose to use will depend on your training. But some common examples are deals closed, support tickets solved, units made and customer satisfaction ratings.

The biggest advantage of performance records is that they're based on numbers, not opinions. This makes them free from bias, and a trusted source of information to judge your training success by. Plus, if your LMS software integrates with your HR tool you can compare training and performance records more easily.

The only downside when it comes to performance records is that they sometimes create more questions than they answer. Yup, performance data shows you where a problem

exists, but not why it exists. So to get to the bottom of “why”, you’ll need to leverage more qualitative tools, like interviews or focus groups.

Self-check 2	Short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain briefly steps of **Kirkpatrick’s Four-level Training Evaluation Model**

Note: **Satisfactory rating - 8 and 15 points Unsatisfactory - below 8and 15points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Information sheet 3	Collecting data from the target group

3.1 CONCEPT OF DATA COLLECTION

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. The data collection component of research is common to all fields of study including physical and social sciences, humanities, business, etc. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same. The goal for all data collection is

to capture quality evidence that then translates to rich data analysis and allows the building of a convincing and credible answer to questions that have been posed. Regardless

of the field of study or preference for defining data (quantitative, qualitative), accurate data collection is essential to maintaining the integrity of research. Both the selection of appropriate data collection instruments (existing, modified, or newly developed) and clearly delineated instructions for their correct use reduce the likelihood of errors occurring.

Data collection is one of the most important stages in conducting a research. You can have the best research design in the world but if you cannot collect the required data you will be not be able to complete your project. Data collection is a very demanding job which needs thorough planning, hard work, patience, perseverance and more to be able to complete the task successfully. Data collection starts with determining what kind of data required followed by the selection of a sample from a certain population. After that, you need to use a certain instrument to collect the data from the selected sample

TYPES OF DATA

Data are organized into two broad categories: qualitative and quantitative.

Qualitative Data: Qualitative data are mostly non-numerical and usually descriptive or nominal in nature. This means the data collected are in the form of words and sentences. Often (not always),such data captures feelings, emotions, or subjective perceptions of something. Qualitative approaches aim to address the 'how' and 'why' of a program and tend to use unstructured methods of data collection to fully explore the topic. Qualitative questions are open-ended. Qualitative methods include focus groups, group discussions and interviews. Qualitative approaches are good for further exploring the effects and unintended consequences of a program. They are, however, expensive and time consuming to implement. Additionally the findings cannot be generalized to participants outside of the program and are only indicative of the group involved.

Qualitative data collection methods play an important role in impact evaluation by providing information useful to understand the processes behind observed results and assess changes in people's perceptions of their well-being. Furthermore qualitative methods can be used to improve the quality of survey-based quantitative evaluations by helping generate evaluation hypothesis; strengthening the design of survey questionnaires and expanding or clarifying quantitative evaluation findings. These methods are characterized by the following attributes -

they tend to be open-ended and have less structured protocols (i.e., researchers may change the

Data collection strategy by adding, refining, or dropping techniques or informants);

•

They rely more heavily on interactive interviews; respondents may be interviewed several times to follow up on a particular issue, clarify concepts or check the reliability of data;

•

they use triangulation to increase the credibility of their findings (i.e., researchers rely on multiple data collection methods to check the authenticity of their results

Generally their findings are not generalizable to any specific population, rather each case study produces a single piece of evidence that can be used to seek general patterns among different studies of the same issue.

Regardless of the kinds of data involved, data collection in a qualitative study takes a great deal of time. The researcher needs to record any potentially useful data thoroughly, accurately, and systematically, using field notes, sketches, audiotapes, photographs and other suitable means. The data collection methods must observe the ethical principles of research. The qualitative methods most commonly used in evaluation can be classified in three broad categories –

In-depth interview

Observation methods

Document review

Quantitative Data: Quantitative data is numerical in nature and can be mathematically computed. Quantitative data measure uses different scales, which can be classified as nominal scale, ordinal scale, interval scale and ratio scale. Often (not always), such data includes measurements of something. Quantitative approaches address the 'what' of the program. They use a systematic standardized approach and employ methods such as surveys and ask questions. Quantitative approaches have the advantage that they are cheaper to implement, are standardized so comparisons can be easily made and the size of the effect can usually be measured. Quantitative approaches however are limited in their capacity for the investigation and explanation of similarities and unexpected differences. It is important to note that for peer-based programs quantitative data collection approaches often prove to be difficult to implement for agencies as lack of necessary resources to ensure rigorous implementation of surveys and frequently experienced low participation and loss to follow up rates are commonly experienced factors. The Quantitative data collection methods rely on random sampling and structured data collection instruments that fit diverse experiences into predetermined response categories. They produce results that are easy to summarize, compare, and generalize. If the intent is to generalize from the research participants to a larger population, the researcher will employ probability sampling to select participants. Typical quantitative data gathering strategies include –

Experiments/clinical trials.

Observing and recording well-defined events (e.g., counting the number of patients waiting in emergency at specified times of the day).

Obtaining relevant data from management information systems.

Administering surveys with closed-ended questions (e.g., face-to face and telephone interviews, questionnaires etc.).

In quantitative research (survey research), interviews are more structured than in Qualitative research. In a structured interview, the researcher asks a standard set of questions and nothing more. Face -to -face interviews have a distinct advantage of enabling the researcher to establish rapport with potential participants and therefore gain their cooperation.

Paper-pencil-questionnaires can be sent to a large number of people and saves the researcher time and money. People are more truthful while responding to the questionnaires regarding controversial issues in particular due to the fact that their responses are anonymous.

Mixed Methods: Mixed methods approach as design, combining both qualitative and quantitative research data, techniques and methods within a single research framework.

Mixed methods approaches may mean a number of things, i.e. a number of different types of methods in a study or at different points within a methods encompass multifaceted approaches that combine to capitalize on strengths and reduce weaknesses that stem from using a single research design. Using this approach to gather and evaluate data may assist to increase the validity and reliability of the research. Some of the common areas in which mixed-method approaches may be used include –

Initiating, designing, developing and expanding interventions;

Evaluation;

Improving research design; and

Corroborating findings, data triangulation or convergence. Some of the challenges of using a mixed methods approach include –

Delineating complementary qualitative and quantitative research questions;

Time-intensive data collection and analysis; and

Decisions regarding which research methods to combine. Mixed methods are useful in highlighting complex research problems such as disparities in health and can also be transformative in addressing issues for vulnerable or marginalized populations or research which involves community participation. Using a mixed-methods approach is one way to develop creative options to traditional or single design approaches to research and evaluation. There are many ways of classifying data. A common classification is based upon who collected topic

Self-check 3	Multiple choice

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ----is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research

A. data collection B. data analyzing

C. data summary D. data interpretation

2. Mostly non-numerical and usually descriptive or nominal in nature is

A. Mixed Methods C. Quantitative Data

B. Qualitative Data D. All

3. The qualitative methods most commonly used in evaluation can be

A. In-depth interview B. Observation methods C. Document review D.All

4. Data summary is one of the most important stages in conducting a research.

A. true B. false

5. which methods approaches may mean a number of things,

A. Mixed Methods

B. Quantitative Data

C. Qualitative Data

D. All

Note: **Satisfactory rating – 4 points** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer

Score = _____

Rating: _____

Information sheet 4	Analyzing data.

4.1 What is Data Analysis?

Data analysis is defined as a process of cleaning, transforming, and modeling data to discover useful information for business decision-making. The purpose of Data Analysis is to extract useful information from data and taking the decision based upon the data analysis.

A simple example of Data analysis is whenever we take any decision in our day-to-day life is by thinking about what happened last time or what will happen by choosing that particular decision. This is nothing but analyzing our past or future and making decisions based on it. For that, we gather memories of our past or dreams of our future. So that is nothing but data analysis. Now same thing analyst does for business purposes, is called Data Analysis.

4.2 Types of Data Analysis: Techniques and Methods

There are several **types of Data Analysis** techniques that exist based on business and technology. However, the major Data Analysis methods are:

- Text Analysis
- Statistical Analysis
- Diagnostic Analysis
- Predictive Analysis

- Prescriptive Analysis

4.3 Data Analysis Process

The Data Analysis Process is nothing but gathering information by using a proper application or tool which allows you to explore the data and find a pattern in it. Based on that information and data, you can make decisions, or you can get ultimate conclusions.

- Data Analysis consists of the following phases:
- Data Requirement Gathering
- Data Collection
- Data Cleaning
- Data Analysis
- Data Interpretation
- Data Visualization

First of all, you have to think about why do you want to do this data analysis? All you need to find out the purpose or aim of doing the Analysis of data. You have to decide which type of data analysis you wanted to do! In this phase, you have to decide what to analyze and how to measure it, you have to understand why you are investigating and what measures you have to use to do this Analysis.

Self-check 4	True/false /short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Data collection is defined as a process of cleaning, transforming, and modeling data to discover useful information for business decision-making.
2. The purpose of Data Analysis is to extract useful information from data and taking the decision based upon the data analysis
3. List steps of Data Analysis Process

Note: **Satisfactory rating 6 points** **Unsatisfactory – 6 points**

You can ask you teacher for the copy of the correct answers.

Answer

Score = _____
Rating: _____

Information sheet 5	Interpreting analysis output.

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5.1 What Is Data Interpretation

Data interpretation refers to the implementation of processes through which data is reviewed for the purpose of arriving at an informed conclusion. The interpretation of data assigns a meaning to the information analyzed and determines its signification and implications.

The importance of data interpretation is evident and this is why it needs to be done properly. Data is very likely to arrive from multiple sources and has a tendency to enter the analysis process with haphazard ordering. Data analysis tends to be extremely subjective. That is to say, the nature and goal of interpretation will vary from business to business, likely correlating to the type of data being analyzed. While there are several different types of processes that are implemented based on individual data nature, the two broadest and most common categories are “quantitative analysis” and “qualitative analysis**”**

Yet, before any serious data interpretation inquiry can begin, it should be understood that visual presentations of data findings are irrelevant unless a sound decision is made regarding scales of measurement. Before any serious data analysis can begin, the scale of measurement must be decided for the data as this will have a long-term impact on data interpretation ROI. The varying scales include:

Nominal Scale: non-numeric categories that cannot be ranked or compared quantitatively. Variables are exclusive and exhaustive.

Ordinal Scale: exclusive categories that are exclusive and exhaustive but with a logical order. Quality ratings and agreement ratings are examples of ordinal scales (i.e., good, very good, fair, etc., OR agree, strongly agree, disagree, etc.).
Interval: a measurement scale where data is grouped into categories with orderly and equal distances between the categories. There is always an arbitrary zero point.
Ratio: contains features of all three**.**

For a more in-depth review of scales of measurement, read our article on data analysis questions. Once scales of measurement have been selected, it is time to select which of the two broad interpretation processes will best suit your data needs. Let's take a closer look at those specific data interpretation methods and possible data interpretation problems

1.1 **How to Interpret Data**?

When interpreting data, an analyst must try to discern the differences between correlation, causation and coincidences, as well as many other bias – but he also has to consider all the factors involved that may have led to a result. There are various data interpretation methods one can use.

The interpretation of data is designed to help people make sense of numerical data that has been collected, analyzed and presented. Having a baseline method (or methods) for interpreting data will provide your analyst teams a structure and consistent foundation. Indeed, if several departments have different approaches to interpret the same data, while sharing the same goals, some mismatched objectives can result. Disparate methods will lead to duplicated efforts, inconsistent solutions, wasted energy and inevitably – time and money. In this part, we will look at the two main methods of interpretation of data: with a qualitative and a quantitative analysis**.**

5.3 Qualitative Data Interpretation

Qualitative data analysis can be summed up in one word – categorical. With qualitative analysis, data is not described through numerical values or patterns, but through the use of descriptive context (i.e., text). Typically, narrative data is gathered by employing a wide variety of person-to-person techniques. These techniques include:

Observations: detailing behavioral patterns that occur within an observation group. These patterns could be the amount of time spent in an activity, the type of activity and the method of communication employed.

Documents: much like how patterns of behavior can be observed, different types of documentation resources can be coded and divided based on the type of material they contain.

Interviews: one of the best collection methods for narrative data. Enquiry responses can be grouped by theme, topic or category. The interview approach allows for highly-focused data segmentation.

A key difference between qualitative and quantitative analysis is clearly noticeable in the interpretation stage. Qualitative data, as it is widely open to interpretation, must be "coded" so as to facilitate the grouping and labeling of data into identifiable themes. As person-to-person data collection techniques can often result in disputes pertaining to proper analysis, qualitative data analysis is often summarized through three basic principles: notice things, collect things, think about things.

5.4 Quantitative Data Interpretation

If quantitative data interpretation could be summed up in one word (and it really can't) that word would be "numerical." There are few certainties when it comes to data analysis, but you can be sure that if the research you are engaging in has no numbers involved, it is not quantitative research. Quantitative analysis refers to a set of processes by which numerical data is analyzed. More often than not, it involves the use of statistical modeling such as standard deviation, mean and median. Let's quickly review the most common statistical terms:

Mean: a mean represents a numerical average for a set of responses. When dealing with a data set (or multiple data sets), a mean will represent a central value of a specific set of numbers. It is the sum of the values divided by the number of values within the data set. Other terms that can be used to describe the concept are arithmetic mean, average and mathematical expectation.

Standard deviation: this is another statistical term commonly appearing in quantitative **analysis**. Standard deviation reveals the distribution of the responses around the mean. It describes the degree of consistency within the responses; together with the mean, it provides insight into data sets.

Frequency distribution: this is a measurement gauging the rate of a response appearance within a data set. When using a survey, for example, frequency distribution has the capability of determining the number of times a specific ordinal scale response appears (i.e., agree, strongly agree, disagree, etc.). Frequency distribution is extremely keen in determining the degree of consensus among data points.

Typically, quantitative data is measured by visually presenting correlation tests between two or more variables of significance. Different processes can be used together or separately, and comparisons can be made to ultimately arrive at a conclusion. Other signature interpretation processes of quantitative data include:

- Regression analysis
- Cohort analysis
- Predictive and prescriptive analysis

Now that we have seen how to interpret data, let's move on and ask ourselves some questions: what are some data interpretation benefits? Why do all industries engage in data research and analysis? These are basic questions, but that often don’t receive adequate attention**.**

Self-check 5	True/false /short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ---------- Non-numeric categories that cannot be ranked or compared quantitatively. Variables are exclusive and exhaustive.

   A. Mean

   B. Standard deviation

   C. Frequency distribution

2. Signature interpretation processes of quantitative data include:
   A. Regression analysis
   B. Cohort analysis
   C. Predictive and prescriptive analysis
   D.ALL

3. One of the best collection methods for narrative data

   A. Observations

   B. Documents

   C. Interviews

   D. **All**

4. When interpreting data, an analyst must try to discern the differences between correlation, causation and coincidences, as well as many other bias

   A. true B. false

Note: **Satisfactory rating – 4 points** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name: _____

Score = _____
Rating: _____

Information sheet 6	Recording evaluation report.

6.1 Management can make training programme effective, if following guidelines are strictly followed:

1. Training objective to be specific to performance standards of trainees to achieve organizational objectives

2. Proper screening of personal needs in comparison to operational needs will give an added advantage to establish actual needs of individual employees.

3. Efforts should be made to establish where the trainee has the required intelligence, maturity and also the motivation to successfully complete the training programme. If this is not noticed among trainees the training programme may be postponed or cancelled till adequate improvements are noticed.

4. The trained should be encouraged to see the training by making him aware of the personal benefits he can avail through better performance.

5. Training programme to be planned so that it is related to the trainees' previous experience and background. This background may be used as a base for new advancement in professional career.

6. Efforts to be taken to create friendly atmosphere that is conducive to good learning environment. Any deviation in the process of environment to be avoided well in advance. Permission to be obtained from top level management before commencing the training at lower levels.

7. It is to be understood that all levels of trainees do not progress at the same speed; hence, flexibility should be shown in judging the rate of progress in the training programme.

8. The personal involvement of trainees, as far as possible be encouraged in the training programme. He should be given opportunity to participate to have adequate practical knowledge in the newly needed behavioural norms.

9. As the trainee's acquisition knowledge, skills, attributes and utilise them while executing the job. At the same time the trainee should be motivated for better performance and also be given necessary incentives.

10. Trainees to be given personal guidance as and when needed so as to help obviate learning obstacles.

6.1 Recording and reporting evaluations

Self-check 5	short answer

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List guideline of management

Note: **Satisfactory rating – 4 points** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Name: _____

Score = _____
Rating: _____

Reference

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This TTLM is developed from respective EOS by: ⬇⬇⬇

No	Name of trainer	Qualification	Region	E-mail
1	MELESE RORESA	Electronics and communication technology management lecturer **(M.Sc.)**	Ethio-Italy Poly Technic College	melese.r2003@gmail.com
2	WONDIMU ZEYEDE	Biomedical Engineering Instructor **(B.Sc.)**	Addis Ababa Tegbared Polytechnic College	wondimzeyu336@gmail.com
3	TEBEJE BEYENE	Biomedical Engineering Instructor **(B.Sc.)**	Addis Ababa Tegbared Polytechnic College	tebejebme@gmail.com
4	DECHASA AMDISA	Biomedical Engineering Instructor **(B.Sc.)**	Addis Ababa Tegbared Polytechnic College	amdissad@gmail.com

ANSWER SHEET OF ALL LEARNING GUIDE (LG27 – LG31)

Key to Corrections (for Learning Guides)

Learning Guide #27
Answers for self-check 1 1.D 2.A 3.B 4.C 5. E **Answers for self-check 2** 1. doctors, 2. nurses 3. Technicians. 4. clinical engineers **Answers for self-check 4** 1. Assess training needs: 2. Set organizational training objectives: 3. Create training action plan: 4. Implement training initiatives **5.** Evaluate & revise training**:** **Answers for self-check 5** 1. Medical director 2. Human resource 3. Capacity building office 4. HTM working group 5. Finance bureau 6. Biomedical /clinical engineering department

Learning Guide #28

Answers for self-check 1

1.TRUE

2.FALSE

3.TRUE

4.FALSE

Answers for self-check 2

1.TRUE

2.FALSE

3.TRUE

Answers for self-check 3

1. FALSE

2.FALSE

3.FALSE

4.TRUE

Answers for self-check 4

1. **TRUE**
2.
    a. Explore overall performance
    b. Compare yourself to similar organizations
    c. Perform individual assessments
    d. Consider your industry
    e. Different training programs for different roles

Learning Guide #29

Answers for self-check 1

A. Course Name, Number, Credits and Description

B. Prerequisites/Co-requisites

C. Instructors Name, Contact Info and Bio

D. Course Schedule

E. Learning Outcomes

F. Content Breakdown by Session

G. Instructional Methods Used

H. Course Evaluation Process, Policies and Grading Scale

I. Classroom Rules/Code of Conduct Expectations

J. Course Materials

Answers for self-check 2

1. utilize all the equipment in their facilities
2. Right equipment is used for the right purpose.
3. identify all the faulty equipment
4. carry out equipment inventory
5. To change the attitude of Health workers

Answers for self-check 3

1. D
2. D
3. B
4. D
5. A

Answers for self-check 4

1. TRUE
2. TRUE
3. TRUE
4. FALSE

Answers for self-check 5

1. TRUE
2. TRUE
3. TRUE
4. TRUE

Answers for self-check 6

1. **D**
2. **D**
3. **D**

Learning Guide #31

Answers for self-check 1

1. A
2. A
3. A
4. B

Answers for self-check 2

1. Evaluate learners' reactions to training
2. Measure what was learned during training.
3. Assess whether or not (and how much) behavior has changed as a result of training
4. evaluate the impact

Answers for self-check 3

1. A
2. B
3. D
4. B
5. A

Answers for self-check 4

1. FALSE
2. TRUE

Answers for self-check 5

1. B
2. D
3. C
4. A

Answers for self-check 6

1. Training objective
2. Proper screening
3. Efforts
4. Encourage
5. personal involvement