Ethiopian TVET-System

INFORMATION TECHNOLOGY SUPPORT SERVICE

Level I

LEARNING GUIDE # 21

Unit of Competence:	Connect Hardware Peripherals
Module Title:	Connecting Hardware Peripherals
LG Code:	ICT ITS1 L03-LG-21
TTLM Code:	ICT ITS1 TTLM M06 1019

LO 3: Connect Hardware Peripherals

Instruction Sheet	**Learning Guide # 21**

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

- Verifying timeframe for installation, environmental consideration and OH&S standard
- Removing and replacing old peripherals
- Connecting and configuring computers to accept the new peripherals
- Testing and confirming hardware peripherals

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 –

- Verify timeframe for installation schedule with the client in accordance with the organization requirements
- Remove and/or replace old peripherals with minimum disruption to clients taking into account environmental considerations and OHS standards
- Connect new peripherals with minimum disruption to clients and taking into account the operating system procedures
- Configure the computer to accept the new peripherals
- Test hardware peripherals and confirm client satisfaction, particular attention must be paid to possible impact on other systems and adjustments are made as required.

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 and Sheet 4 " in page 3, 7, 11 and 18 respectively.

4. Accomplish the "Self-check 1, Self-check t 2, Self-check 3 and Self-check 4 in page 6, 10, 17 and 21 respectively.

5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1 in page 11.

6. Do the "LAP test" in page 17.

Information Sheet 1	Verifying timeframe for installation, Environmental Consideration and OH&S standard

3.1. Installing hardware peripherals based on timeframe, environmental consideration and OH&S standard

One of the most important considerations when installing a new hardware peripheral is to try and install the device with the least amount of timeframe for installation, environmental consideration and OH&S standards. A client may not be very happy if you install a piece of hardware equipment while they are creating an urgent report, if may take time to install it the peripheral devices and also the interconnection of the devices create un-proper/un-safe/ working condition at the work place within any organization. It is important to schedule installation time and OHS standards that are:-

- Also suitable to the client's or computer user's
- Sufficient length to install and thoroughly test the hardware device and
- Create attractive working place for the clients

To achieve this, make sure that you are aware of:-

- Common organizational procedures/guideline/ that regularly need to be performed on the computer (for example, end of month processing or weekly backups) and plan installations outside these periods and the way to create save work place.
- Current working condition, deadlines and schedules of the client/user. Therefore, the installations and the OHS standards should be scheduled for the times such as:
  - ✓ Quiet periods (for example, during holiday periods)
  - ✓ Before or after normal office hours
  - ✓ While the client/user is out of the office
  - ✓ When the client will not need their computer.

3.2. Environmental Consideration

It can be difficult to work out how long it will take to install a peripheral device. It will vary according to the type of device, current environmental consideration, problems requiring troubleshooting and the experience of the installer/technicians/. If you will be regularly performing installations, keeping a log of installations, nothing that create disruption to the users are required and problems experienced, could help to estimate the time spent on future installations and create safely work place at any organization.

Once you have arranged a suitable time, make sure you adhere to it or give advanced notice if you will be delayed. Remember that clients may have scheduled their daily workload around the installation.

Also consider the timeframe expected by client when installing new hardware peripherals. If you work for a busy organization it may be necessary to work out a daily to-do list. Order tasks with priority given to installations that perform critical functions or have been waiting to be done for the longest amount of time for installation.

3.3. User Safety and OH&S standard Consideration

The user safety and OH&S standard consideration is most important issues when removing/installing peripheral devices to the system unit. Some of the following safety issues are as follows:-

- **Electrical Safety**
  - ✓ connected to 240V mains supply
  - ✓ Always turn off power at point and disconnect the power connection
  - ✓ Avoid over loading power board/point
  - ✓ Make sure power boards have safety switches
  - ✓ Make sure no fluid around where peripheral device is stored, installed used

- **User Safety when handling/removing peripherals**
  - ✓ Make sure sufficient room for unpacking
  - ✓ Ensure enough lighting to see what doing, read manual
  - ✓ Check weight before lifting to safe lifting procedures
  - ✓ Clear space to put peripheral down

- **User Safety when placing/storing peripherals**
  - ✓ E.g. monitor can't be placed in a place reflecting light
  - ✓ Route cables and power leads so they
  - ✓ Can reach connection point wont being danger of trod on/rolled over by chairs
  - ✓ Consider HOW USER will use frequency placement

- **Care of Peripherals – handling/moving**
  - ✓ Read manual for any special precautions e.g. temp, stance
  - ✓ Things that can damage a peripheral: sudden shock, fluid spills, humid/dusty environs, power turned on/off quickly.

- ✓ Electrostatic Discharge: wear earth strap: static builds in body e.g. from walking across carpet on dry day – high voltage discharge can occur if touch earthed device

- **Peripheral care when placing and storing peripherals**
  - ✓ Consult MANUAL
  - ✓ Enough ventilation? Free from fluid? Is this area subject to sunlight any other time? Are people likely to store things on top of peripherals such as vibrations/ventilation problems
  - ✓ Cables placed so user doesn't trip?
  - ✓ Any consumables required e.g. toner

Self-Check – 1	Written Test

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

1. When is the best time to schedule hardware installation? Give four (4). (4points)
2. What must be done after the installation of hardware peripherals? (4 point)
3. Advantages of applying OHS at work place when installing peripheral devices? (4 point)

Answer Sheet

Score = _____

Rating: _____

Name: _____   Date: _____

Short Answer Questions

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

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

Information Sheet 2	Removing and Replacing Old Peripherals

3.2. Removing and connecting /installing/ old peripheral devices

All computer users important to understand safely connect hardware peripherals devices according to vendor instructions with a minimum of down time to the system and ensure that you adhere to the OH&S regulations relating to working with electrical equipments as well as environmental consideration like dust, temperature, humidity, electric system, working tables and so on.

- **Connecting Peripherals**
  - ✓ Connect the hardware
  - ✓ Install the software drivers
  - ✓ Test the peripheral

- **Peripheral Software Drivers**
  - ✓ Driver software: allows computer to recognize new hardware
  - ✓ windows has it for common hardware e.g. modem
  - ✓ if comes with 'disk' use it as it is more recent
  - ✓ if on internet check 'readme.txt' file first – latest drivers
  - ✓ peripheral manual guides to installation process OR 'control panel'

- **Installing the Drivers for Peripheral Configurations**
  Drivers for monitors on windows drivers otherwise you wouldn't be able to see. But if specific, install by:-
  - ✓ **Plug and Play**
    Computer will recognize new device when turned on and connected → on-screen wizard – choose between automatic/manual installation.
  - ✓ **Automatic detection**
    If monitor not plug and play compatible → **Control panel**
    Double click on 'install new hardware.
  - ✓ **Manual Detection**
    If select 'no' to automatic detection, you will be asked to choose type of device, If have a software driver click 'have disk' , Installation will proceed, then **backup** any system files changed during installation 'readme.txt/ file contains.

Operation Sheet – 1	Removing or replacing old peripheral devices

Table 3.2. You will be assessed using the checklist below either removing or replacing old peripheral devices

Student Name:	Device 1	Device 2	Device 3	Device 4	Device 5 etc.
List the name of each device under each heading:					
Did the students:					
• Verify the timeframe for installation schedule with the client					
• Remove old peripherals if they are being replaced with minimal disruption to clients, taking into account environmental considerations and OH&S standards					
• Connect new peripherals with minimum disruption to clients, taking into account operating system procedures					
• Configure the computer to accept the new peripherals					
• Test hardware peripherals and confirm client satisfaction, pay particular attention to possible impact on other systems and make adjustments as required					
• Safely connect hardware peripherals according to vendor instructions with a minimum of down time to the system.					
• Competency is required in the connection of five different peripherals.					

• Interpret vendor manuals in relation to the storage and connection of hardware peripherals					
• Adhere to OH&S regulations relating to working with electrical equipment					
• Decision making in a limited range of options					
• Literacy for general workplace documentation					
• Problem solving skills for a defined range of predictable problems					
• Plain English literacy and communication skills in relation to analysis, evaluation and presentation of information					
• Facilitation and presentation skills in relation to transferring and collecting information					
• Negotiation skills in relation to other team members and applied to a defined range of predictable problems					

Self-Check – 2	Written Test

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

Part I: - Say true of false for the following questions

1. Plug and play peripheral devices needs automatic configuration.(2 points)
2. Optical mouse and keyboard is PnP devices. .(2 points)
3. PS/2 ports are used to plug wireless mouse and keyboards. .(2 points)
4. A device driver supports installing and configuring peripheral devices. .(2 points)
5. Testing is the basic tasks in peripheral device connection. .(2 points)

Answer Sheet

> **Score = _____**
>
> **Rating: _____**

Name: _____   Date: _____

Short Answer Questions

Note: Satisfactory rating – 10 points   **Unsatisfactory - below 5 points**

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

Information Sheet 3	Connecting and configuring computers to accept the new peripherals

3.3. Connecting and configuring hardware peripheral devices

With the large variety of computer systems, operating systems, peripheral device types and features, and manufacturers, each peripheral device will have its own individual installation procedures. It is important to refer to manufacturer guidelines and manuals when installing any hardware device to ensure that all procedures are correctly followed.

Procedures which are generally followed when installing any new peripheral device include:

- Plugging in the cables between the device and computer system
- Installing driver software for configuration
- Troubleshooting device installation when necessary
- Customising the device and updating drivers
- Testing the device for satisfying required conditions of clients

Whenever you install a hardware peripheral device, you may also have to install a driver depending on types of devices. A device driver is a software program that allows the hardware device to talk to the operating system and create an interface between users and devices.

Generally, device driver software will be included within the packaging of a new device. Sometimes operating systems, such as Windows XP, Windows 7, automatically provide their own drivers if you don't provide one. At times it may be necessary to find a newer version of a driver than the one that has been provided by the manufacturer. It is a good idea to regularly check the manufacturer's website to see if any new drivers have been developed for the specific peripheral devices.

Plug and play is a hardware technology that enables many operating systems to automatically recognise new hardware devices and configure them automatically. Most USB devices support plug and play (PnP devices).

- ✓ **Plugging in the cables between the device and computer system**

  To make your computer work, you need to connect all the hardware peripherals to the ports at the back of the system unit case. Before connecting all the peripherals to its corresponding ports, check it that the power cord was unplug into the power source to prevent electrical related injury. You should be able to connect the Mouse, Keyboard, Monitor, Printer, Scanner, Speaker and power up your computer by connecting the power cord to the power supply.   After doing so, you can now start using your computer. Some examples as follows:-
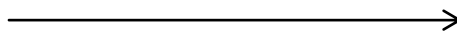
✓ Before powering up your PC, make sure that the power cable was connected to the power supply

To do it, you connect connector to the port   the monitor by using the VGA cord

Comparison of VGA and DVI connectors

Monitors will either have a VGA or a newer DVI plug (see picture, as they are a lot less apparent than PS/2 / USB by comparison). Most monitors use VGA connectors, and so most graphics cards have VGA output. If you have one type of plug and the graphics card has another, you can easily buy an adapter. Some cards even come with one.

✓ **Connecting Mouse and Keyboard**
There are two standard connectors for mice and keyboards; PS/2 connectors and the more modern USB connectors. Plug the mouse and keyboard in the appropriate slot.

PS2 Cable

✓ To connect the scanner to the PC, you will use also use the USB cable.

USB Cable ─────────────────────→

✓ For audio devices such as speaker or headset, you can connect it o and Mic

Speaker/headset ───────────────→

Mic ───────────────→

✓ To connect the Printer to the PC, you will use the cable below via printer port. A USB able is now also being use to connect the new printer to the computer especially the colored and laser printer.

- **Steps to installing and configuring a printer**
  Printer cable

Step1. Obtain the correct printer cable
In many cases a printer won't automatically have a cable included with the original purchase. Check the printer specifications; you will probably need to buy either a parallel or USB cable.

Step2. Plug in the cable
✓ Turn off the power of both printer and computer system
✓ Plug the printer cable into the correct port of the computer but depending on the type of printer the port will most likely to be either a USB or a parallel port located on the back of the computer system. If you are plugging the cable into a parallel port connection you will need to secure the cable by either tightening small screws or snapping in wire connectors.

Steps3. Install ink cartridges of printers

Depending on the printer you have you may need to install an ink cartridge (for inkjet printers) or toner cartridge (for laser printers). Turn the computer's power on and follow the manufacturer's guidelines to install a new cartridge.

Steps4. Install the printer driver

At some point the computer will either recognise that new hardware has been installed (for example if the operating system is plug and play compatible) or you will need to tell the computer that a new device has been added. In other case, you will work at some stage be asked for the printer model and a printer driver. Make sure you install the printer driver at this stage. Sometimes the installation CD will automatically run, installing the printer driver at the same time.

Steps5. Print a test page

Often at the end of the driver installation you will be asked if you would like to print a test page. This is a good idea because you can quickly determine if the printer is working correctly. If not you can troubleshoot the installation.

Steps6. Troubleshoot printer installation (when necessary depends on its type)

If a page is not able to print it is necessary to go back and determine why the printer is not working. There are a number of factors that can contribute to printer problems including these:-

- ✓ Cables between printer and computer are not properly connected
- ✓ Printer driver is not suitable for the current operating system
- ✓ Paper is loaded incorrectly
- ✓ Ink cartridge or toner is not correctly installed
- ✓ Printer power switch is off and so on

- **Suggested solutions for common printer problems**

  A blank page is coming out of the printer
  - ✓ You may have run out of ink or toner. Replace ink cartridge or toner.
  - ✓ Make sure that your printer has been set to the default setting.

- **The document is printing on the wrong part of the page**
  - ✓ Check that you have aligned printer to the correct orientation (portrait or landscape).
  - ✓ Make sure the margins have been set correctly in the software program you are using (eg the word processor or desktop publishing package).
  - ✓ Make sure that the paper has been loaded correctly.

- **The quality of the printout is poor**
  - ✓ If the printer is an inkjet the heads of the ink cartridge may need to be cleaned.
  - ✓ Some printers have software that allows you to change the quality of the printout from draft to best quality.
- **Customizing the printer**

  Depending on your client's needs, there may be a need to alter the default printer settings. Some settings that may be customised include:
  - ✓ Changing the page layout: - a page may need to be printed in either landscape or portrait orientation.
  - ✓ Changing the paper source/size/:- depending on the complexity of the printer there may be a variety of trays the printer has available to use.
  - ✓ Changing the print quality:- depending on the printer use, a client may require best, normal or draft quality of print.
  - ✓ Setting the default printer:- if there is more than one printer attached to a computer, you may need to change the settings so that the newer model is considered the default model.
- **Installing a scanner**

  Scanners can attach to a computer generally via a USB or a parallel port connection.

Steps1. Turn off the computer and position the scanner

Before commencing installation, turn of power to the computer and place the scanner on a level surface, close enough to the computer so that the cable will be able to attach to both devices.

Steps2. Unlock the scanner

Many scanners have a lock on the bottom to make sure that components are not dislodged when transporting. Make sure that you unlock the scanner before commencing installation.

Steps3. Plug in the cable

Plug the cable into either the USB or parallel port connection, depending on the type of scanner.

Steps4. Turn on the scanner

Some scanners will have a power cord that will need to be plugged into a power outlet. Other scanners are dependent on power from the computer. Some scanners will also have an on/off switch, which will also need to be turned on.

Steps5. Turn on the PC

When you turn on your computer, most operating systems will recognise that new hardware has been added (eg it is plug and play compatible). If it hasn't recognised the new scanner you may need to tell your computer that a new device has been added.

Steps6. Insert the scanner driver

At some point you will be asked if you have a disk for your scanner. This generally means the computer is requesting you provide it with the disk containing the driver software.

Steps7. Scan a test image

- ✓ Ensure that the scanner is working by performing a scan of a book or magazine page.

Steps8.Troubleshoot scanner installation (if necessary), suggested solutions for common scanner problems are:-

- ✓ Scanner making a clicking sound
  Check that the scanner lock is in the unlock position.
- ✓ Unable to scan anything
  Make sure that the scanner is plugged in and all cables are connected properly.
- ✓ Customize the scanner

Many scanners will also have extra software you can use for scanning. Check the scanner manual to see whether your scanner has additional software. Install the additional software and it will probably be useful for scanning text and performing basic image editing functions. The software may also allow you ability to adjust settings such as dpi (dots per inch), colour, black and white or greyscale. Make sure you modify settings for normal scanning requirements.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: You are required to perform the following individually with the presence of your teacher.

1. Installing and configuring peripheral devices of computer system and make the computer to works and connect the peripherals listed below to its corresponding ports and make sure that it will all work properly. (Apply safety procedure) (5 points)
   - Monitor
   - Mouse
   - Keyboard
   - Printer
   - Scanner
   - Speaker
   - Power Cord
2. Why is it necessary to make minimal disruption to the client when replacing hardware peripherals? (5 points)
3. Explain the difference between installing and configuring peripheral devices? (5 points)

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

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

Information Sheet – 4	Testing and Confirming Hardware Peripherals

4.1. Testing hardware peripherals

In addition to ensuring a device is able to perform a basic task (such as printing a test page or scanning an image) it is also necessary that all functionality required by the client is tested. When new peripheral equipment is not tested for critical functions before being used, it can lead to malfunction, causing large disruptions to clients and potentially damage other parts of a computer system. If, for example, a new external zip drive has not been tested to check it will be capable of making backups of specific files, it could mean that vital information of the client's could be destroyed if those backups were not successful.

Ensure that all new installations are thoroughly tested after initial setup and prior to use by the client. Depending on the device, different functions will need to be tested. Devices that have components that are known to degrade with time, especially printers, should also be tested periodically. Printers need to be routinely tested, as components such as the ink cartridges and toner can cause deterioration of print quality and may require maintenance and/or cleaning.

4.2. All tests should be completed according to a documented test plan.

Some suggestions of functions that may be tested for a printer, scanner and digital camera devices are included as follows:-

- **Printer: -** Printer functions that may be tested are:-

  - ✓ Can the printer handle different paper types (for example A4, A5, foolscap, thick, thin, overhead transparencies)?
  - ✓ Will the printer work successfully on different computers?
  - ✓ Will the printer work successfully with different software packages (for example, word processing, spreadsheets and desktop publishing)?
  - ✓ Is black and white print quality acceptable to clients?
  - ✓ Is colour print quality acceptable to clients?

- **Scanner: -** Scanner functions that may be tested are:-
  - ✓ Is the resolution of a scanned image an acceptable quality?

✓ Does the scanner work correctly with different software packages (e.g. a word processor or desktop publishing package)?

✓ Can the scanner handle items of unusual size and thickness (e.g. a large book or cardboard poster)?

✓ Does the OCR software scan a document successfully?

✓ Will the scanner work successfully on other computers?

4.3. What is a test plan?

A test plan is used to work out a structured process to ensure that a new device will work under all expected circumstances.   It logically describes:-

✓ Functions that need to be tested

✓ An example test case scenario

✓ Expected results for each scenario

✓ What actually happened once the test has been performed?

Example test case scenarios should simulate realistic work patterns, i.e the scenario should realistically demonstrate if a function will be satisfactory after implementation. Because testing is so critical to the successful implementation of the new device, it is important that a test plan is comprehensive and considers every way a device will need to function after implementation. It is useful to refer back to the client requirements so that you will remember functions that will regularly be expected by the client. On the next page is a test plan, with selected scenarios, to ensure that a printer is working to acceptable client requirements.

Table 1: Sample test plan for a printer

Function	Scenarios	Expected results	Actual results
Printer can produce acceptable quality prints of word processing, spreadsheet and desktop publishing pages	1 Print word processing document 'Policies' 2 Print spreadsheet 'Budget' 3 Print desktop publishing document 'Promotions'	1 Printout of 'Policies' with correct company margin size, acceptable print quality, correct fonts produced 2 Printout of 'Budget' in landscape format, correct margin size, correct fonts produced 3 Printout of 'Promotions' with acceptable image quality, margin size and font display	
Printer handles irregular sized paper	1 Print business card 'Manager' 2 Print A5 poster 'Warehouse sale'	1 'Manager' prints successfully on a business card 2 'Warehouse sale' prints successfully on A5 size paper	
Photos and colour are acceptable quality	1 Print colour photo 'Picnic' 2 Print black and white photo 'Portrait'	1 'Picnic' photo is acceptable quality, correct colour, size 2 'Portrait' photo is acceptable quality, black and white format and size	
Displays appropriate error message when problem occurs	1 Attempt printout without ink cartridge 2 Attempt printout while USB connection is disabled	1 Message 'No cartridge' will display 2 Message 'Printer not attached' will display	

Self-Check 4	Written Test

Name:-_____ Date:-_____

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher.

1. It is used to work out a structured process to ensure that a new device will work under all expected circumstances. (1 point)

2. What does the test plan logically describes? (4 point)

Note*: Satisfactory rating - 10 points   Unsatisfactory - below 5 points

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

Answer Sheet

Score = _____

Rating: _____

Name: _____   Date: _____

Short Answer Questions

List of Reference Materials

- **Winn L Rosch.** The Winn L. Rosch Hardware Bible (6th Edition).
- **Christopher A. Crayton Joel Z. Rosenthal Kevin J. Irwin**. The A+ Certification & PC Repair Handbook (Networking Series).
- **Richard Palmer.** Maintenance Planning and Scheduling Handbook, 2nd Edition (McGraw-Hill Handbooks).
- The A+ e-books and IT Essential Presentation and different URLs resources.

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The development of this Learning Gide for the TVET Program Information technology support service Level I.

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