

**COURSE INFORMATION**

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## **COURSE GUIDE**

### **INTRODUCTION**

Welcome to **LIS 219: Multimedia Application in Libraries and Information Centres**. It is a two-credit (2-CR) course which is a core course for all the undergraduate students in the department. This is designed to enable students explore and apply the strategies that applies to multimedia application in libraries and information centres. The course examined the definition of concept; types and features of multimedia technologies; multimedia technologies application in libraries and information centres; rationale for using multimedia technologies in libraries and information centres; multimedia application in libraries and information service delivery; multimedia presentations, design and production techniques; problems, diagnosis and maintenance of multimedia technologies in library operations; competencies and skills of multimedia librarian; competencies and skills of multimedia users; safety requirements for multimedia utilisation; evaluation of multimedia systems; resources and services; challenges associated with the application and use of multimedia technologies in library and information services in Nigeria. This will facilitate excellent successful academic journey and enhance students' personal development and social status in the community.

This course guide tells you briefly what to expect from reading the accompanying study material. It provides you with information on how to make the best use of the materials so that you can achieve good success. Read it carefully and pay attention to the instructions and suggestions.

### **What You Will Learn in this Course**

This course, LIS 219 with the title Multimedia Application in Libraries and Information Centres, has been explicitly designed to help you understand the importance of multimedia application in libraries and information centres. Therefore, this course highlights the significance of multimedia application in libraries and information centres. You will learn about the:

- definition of multimedia
- concept of multimedia
- types and features of multimedia technologies
- multimedia technologies application in libraries and information centres
- multimedia application in libraries and information service delivery
- rationale for using multimedia technologies in libraries and information centres
- multimedia resources and services
- multimedia presentations
- design and production techniques
- evaluation of multimedia systems
- competencies and skills of multimedia librarian
- competencies and skills of multimedia users
- safety requirements for multimedia utilisation
- diagnosis and maintenance of multimedia technologies in library operations

- problems and challenges associated with the application and use of multimedia technologies in library and information services in Nigeria

## **LEARNING OUTCOMES**

By the end of this course, you should be able to discuss any topic in the area of multimedia application in libraries and information centres. Most specifically, you will be able to:

- Define the concept of multimedia technologies applications in libraries and information centres.
- Types and features of multimedia technologies application in libraries and information centres.
- Use of multimedia in libraries and information centres.
- Skills and maintenance of multimedia technologies in library and information centres' operations.
- Safety requirements for multimedia utilization.
- Evaluation of multimedia systems.
- Challenges associated with the application and use of multimedia technologies in library and information services in Nigeria.

## **WORKING THROUGH THIS COURSE**

To successfully complete this course, you are required to participate in both the theoretical and practical parts of the course. You are also to read the study units, listen to the audios and videos, do all assessments, examine the links and read, participate in discussion forums; read the recommended books and other materials provided, prepare your portfolios, and participate in the online facilitation.

Each study unit has introduction, intended learning outcomes, the main content, summary conclusion, and references/further readings. The introduction opens the door to each unit and gives a glimpse of the expectations in the study unit. Read and note the learning outcomes which outline what you should be able to do at the completion of each study unit. This will help you evaluate your learning at the end of each unit to ensure you have achieved the designed objectives (outcomes). To achieve the intended learning outcomes, the content of each section is presented in modules and units with videos and links to other sources to enhance your study. Click on the links as may be directed but where you are reading the text offline, you may have to copy and paste the link address into a browser. You can download the audios and videos to view offline. You can also print or download the texts and save in your computer or external drive. The unit summaries provide a recapitulation of the essential points in the unit. It's an indispensable brief that could garnish your journey through the unit. The conclusion brings you to the climax of the study and what you should be taking away from the unit.

There are two main forms of assessments – the formative and the summative. The formative assessments will help you monitor your learning. This is presented as in-text questions, discussion forums and Self-Assessment Exercises. The summative assessments would be used by the university to evaluate your academic performance. This will be given as

Computer-Based Test (CBT) which serves as continuous assessment and final examinations. A minimum of three computer-based tests will be given with only one final examination at the end of the semester. You are required to take all the computer base tests and the final examination.

## **STUDY UNITS**

There are 15 study units in this course divided into three modules. The modules and units are presented as follows:

### **Module 1: Definition of Concepts**

**Unit 1:** Definition of multimedia

**Unit 2:** Concept of multimedia

**Unit 3:** Types and features of multimedia technologies

**Unit 4:** Multimedia technologies application in libraries and information centres

**Unit 5:** Multimedia application in libraries and information service delivery

### **Module 2: Use of Multimedia in Libraries and Information Centres**

**Unit 1:** Rationale for using multimedia technologies in libraries and information centres

**Unit 2:** Multimedia Resources and services

**Unit 3:** Multimedia presentations

**Unit 4:** Design and production techniques

**Unit 5:** Evaluation of multimedia systems

### **Module 3: Skills and Maintenance of Multimedia Technologies in Library Centres Operations**

**Unit 1:** Competencies and skills of multimedia librarian

**Unit 2:** Competencies and skills of multimedia users

**Unit 3:** Safety requirements for multimedia utilisation

**Unit 4:** Diagnosis and maintenance of multimedia technologies in library operations

**Unit 5:** Problems and Challenges associated with the application and use of multimedia technologies in library and information services in Nigeria

## **PRESENTATION SCHEDULE**

The presentation schedule gives you the important dates for the completion of your computer-based tests, participation in forum discussions and at facilitation. Remember, you are to submit all your assignments at the appropriate time. You should guide against delays and plagiarisms in your work. Plagiarism is a criminal offence in academics and liable to heavy penalty.

## **ASSESSMENT**

There are two main forms of assessment in this course that will be scored. First is the set of Tutor-Marked Assignment (TMAs). You are advised to be sincere in attending to the exercises. The second is TMA. This is the continuous assessment component which is graded. It accounts for 30% of the total scores. You are advised to take this with all

seriousness, because it will assist you to pass the course. The TMAs will be given in accordance to the University calendar. Endeavor to strictly adhere to the slated calendar

### **FINAL EXAMINATION AND GRADING**

At the end of the course, you are required to take an examination which will last for the duration of 2 hours. It has a value of 70% of the total course grade. The examination will consist of questions that will reflect the type of self-assessment, practice the exercises carefully.

Try to use time between the finishing the last unit and sitting for the examination to revise the entire course. You may find it useful to review your Tutor-Marked Assignment or activities before the examination.

### **COURSE MARKING SCHEME**

The following table lays out how the actual course marking is done

Assessment	30% (Undergraduate) 40% (Postgraduate)
Final Examination	70% (Undergraduate) 60% (Postgraduate)
Total	100% of Course work

### **COURSE OVERVIEW**

#### **How to get the Most from the Course**

In Open and Distance Learning Modes (ODL), the study units replace the university lecture. This is one of the advantages of ODL. You can read and work through specially designed study materials at your own pace and at a time and place that is convenient for you. Just as a lecturer may give you classroom exercises, your study units provide exercises for you to do at a particular point in time.

Each of the study units follows a common format. The first item is an introduction to the subject matter of the study unit and how a specific study unit is integrated with the other study and the course as a whole. Following the introduction is the intended learning outcomes which helps you to know what you should be able to do by the time you have completed the study unit. When you are through studying the unit, you should endeavour to go back and check if you have achieved the stated learning outcomes. If you consistently do this, you will improve your chances of passing the course. The main content of the study unit guides you through the required reading from recommended sources.

Tutor-Marked Assignments (TMAs) are found at the end of every study unit. Working through these TMAs will help you to achieve the objectives of the study units and prepare you for the examination.

You should do every SAE as you come to it in the study units. There will also be examples given in the study units. Work through these when you come to them too.

The following is a practical strategy for working through the course. If you encounter any problem, telephone your tutor immediately. Remember, that your tutor's job is to help you. When you need help, do not hesitate to call and ask your tutor to provide it.

1. The main body of the unit guides you through the required reading and directs you to other sources, if any.

2. Your first assignment in this course is to read this course guide thoroughly.
3. Organize a study schedule: Refer to the course overview for more details. You should note that it is expected of you to devote at least 2 hours per week for studying this course. Note important information such as details of your tutorials, dates for submission of TMAs, exams etc. and write it down in your diary.
4. Once you have created your own study schedule, do everything to stay faithful to it. The major reason that students fail is that they get behind with their course work. If you get into difficulties with your schedule, please let your tutor know before it is too late to help.
5. Turn to Unit 1, and read the introduction and the objectives for unit 1.
6. Assemble the study materials. You will need your references and the unit you are studying at any point in time.
7. As you work through the unit, you will know the sources to consult for further readings.
8. Visit your study centre whenever you need up to date information
9. Well before the relevant due dates (about 4 weeks before the due dates), visit your study centre for your next required assignment. Keep in mind that you will learn a lot by doing the assignment carefully. They have been designed to help you meet the objectives of the course and, therefore, will help you pass the examination. Submit all assignments not later than the due date.
10. Review the objectives for each study unit to confirm that you have achieved them. If you feel unsure about any of the objectives, review the study materials or consult your tutor. When you are confident that you have achieved a unit's objectives, you can start on the next unit. Proceed unit by unit through the course and try to space your study so that you can keep yourself on schedule.
11. When you have submitted an assignment to your tutor for marking, do not wait for its return before starting on the next unit. Keep to your schedule. When the assignment is returned, pay particular attention to your tutor's comments, both on the tutor-marked assignment form and also the written comments on the ordinary assignments.
12. After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit objectives (listed at the beginning of each unit) and the course objectives (listed in the Course Guide).



## **Facilitation**

You will receive online facilitation. The facilitation is learner centred. The mode of facilitation shall be asynchronous and synchronous. For the asynchronous facilitation, your facilitator will:

- Present the theme for the week;
- Direct and summarise forum discussions;
- Coordinate activities in the platform;
- Score and grade activities when needed;
- Upload scores into the university recommended platform;
- Support and help you to learn. In this regard personal mails may be sent;
- Send videos, audio lectures and podcasts to you.

For the synchronous:

- There will be eight hours of online real time contacts in the course. This will be through video conferencing in the Learning Management System. The eight hours shall be of one-hour contact for eight times.
- At the end of each one-hour video conferencing, the video will be uploaded for viewing at your pace.
- The facilitator will concentrate on main themes that are must know in the course.
- The facilitator is to present the online real time video facilitation timetable at the beginning of the course.
- The facilitator will take you through the course guide in the first lecture at the start date of facilitation

Do not hesitate to contact your facilitator. Contact your facilitator if you:

- do not understand any part of the study units or the assignments.
- have difficulty with the self-assessment exercises.
- have any question or problem with an assignment or with your tutor's comments on an assignment.

Also, use the contact provided for technical support.

Read all the comments and notes of your facilitator especially on your assignments; participate in the forums and discussions. This gives you the opportunity to socialise with others in the programme. You can discuss any problem encountered during your study. To gain the maximum benefit from course facilitation, prepare a list of questions before the discussion session. You will learn a lot from participating actively in the discussions.

Finally, respond to the questionnaire. This will help the university to know your areas of challenges and how to improve on them for the review of the course materials and lectures.

## **Contents**

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**Unit 1:** Definition of multimedia

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### **Module 3: Skills and Maintenance of Multimedia Technologies in Library Centres Operations**

**Unit 1:** Competencies and skills of multimedia librarian

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**Unit 5:** Problems and Challenges associated with the application and use of multimedia technologies in library and information services in Nigeria

## **MODULE 1: DEFINITION OF CONCEPTS OF MULTIMEDIA**

**Unit 1: Definition of multimedia**

**Unit 2: Concept of multimedia**

**Unit 3: Types and features of multimedia technologies**

**Unit 4: Multimedia technologies application in libraries and information centres**

**Unit 5: Multimedia application in libraries and information service delivery**

### **UNIT 1**

#### **Unit Structure**

**1.1 Introduction**

**1.2 Learning Outcomes**

**1.3 Multimedia**

**1.3.1 Definition of Multimedia**

**1.3.2 Components of Multimedia**

**1.3.3 Usage of Multimedia in Various Fields of Study**

**1.3.4 Multimedia Hardware Requirements**

**1.3.5 Multimedia Software Requirements**

**1.4 Self-Assessment Exercise**

**1.5 Glossary**

**1.6 References/Further Reading**

**1.7 Possible Answers to Self- Assessment Exercise(s) within the context**

#### **1.1 INTRODUCTION**

Multimedia is very important in library and information centres. This is because multimedia is playing significant roles in library and information centres' operations. This unit will introduce you to the definition of multimedia, components of multimedia, usage of multimedia in various fields of study and multimedia hardware and software requirements.

#### **1.2 LEARNING OUTCOMES**

At the end of this session, you will be able to:

- \* Define multimedia
- \* Explain the components of multimedia,
- \* Explain the usage of multimedia in various fields, and
- \* Explain the hardware and software requirements of multimedia.

#### **1.3 MULTIMEDIA**

Multimedia has been defined by various authors. Some of these definitions are:

### **1.3.1 Definition of Multimedia**

Vaughan (1993) defined multimedia as any combination of text, graphic art, sound, animation, and video that is delivered by computer. Also, Chang (2005) defined multimedia as a form of communication that combines different content forms such as text, audio, images, animations, or video into a single interactive presentation, in contrast to traditional mass media which features little to no interaction from users, such as printed material or audio recordings. Furthermore, Pavithra, Aathilingam and Prakash (2019) defined Multimedia as a field concerned with the computer controlled integration of text, graphics, drawings, still and moving images (Video), animation, audio, and any other media where every type of information can be signified, stored, communicated and handled digitally. The authors stated further that multimedia can be recorded and played, displayed, interacted with or accessed by information satisfied processing devices, such as high-tech and automated devices, but can also be part of a live presentation.

Collins Dictionary defined multimedia as computer programmes and products which involve sound, pictures, and film, as well as text. From these definitions, multimedia is concerned with combination of text, graphics, sound, video, animation, and among others with the use of computer to a single interactive presentation. Vanankamudi and Padma (2014) defined multimedia as multiple forms of information content and information processing (e.g. text, audio, graphics, animation, and video interactivity) to inform or entertain the user. It also refers to the use of electronic media to store and experience multimedia content. Also, Elsom-Cook (2001) defined multimedia as the combination of a variety of communication channels into a co-ordinated communicative experience. Fenrich (1997) defined multimedia as exciting combination of computer hardware and software that allows you to integrate video, animation, audio, graphics, and test resources to develop effective presentations on an affordable desktop computer.

For this study, multimedia is defined as combination of relevant text, pictures, video, sound and animation with the aid of computer to convey intended information to the users. From the definition, multimedia is made up of different components, such as text, picture, video, audio and animation. Each of these components is media. The combination of more than one components is referred to as multimedia. This combination with the use of computer is intended to convey a specific message to the users

### **1.3.2 Components of Multimedia**

Multimedia is composed of various components. These are:

#### **Text**

Text is defined as the actual words written in a book, newspaper, blog post, or any other written word. It can also be referred to as characters that are used to create words, sentences and paragraphs. Text indicates information about an object or event, notes, captions, subtitles, contents, indexes, dictionaries, and among others. Text is an imperative constituent of multimedia. It is used to create words, sentences, and paragraphs in order to convey specific information to its readers. It can be ordinary text or various typographic effects for emphasis

or clarification in order to catch the reader's attention. Users may use diverse font size, color, and style to present information or to emphasize a certain word or phrase.

# What is text?

Text is an important component used in many multimedia applications. They are characters that are used to create words, sentences and paragraphs. Text alone provide just one source of information. Yet, text is good at providing basic information.

**Figure 1: Example of Text**

## Graphics

Graphics refers to images and pictures, such as chart, diagram, and photograph, which contain no movement. It is used to present information in form of both traditional and computer generated drawings, prints, maps, charts, and among others. Graphics plays an important role in representation or presentation of information.



**Figure 2: Example of Graphic**

### **Animation**

Animation is the rapid display of a sequence of images of 2-D or 3-D artwork or model positions in order to create an illusion of movement. Simply speaking, it ranges scope from the basic graph with a simple motion to a detailed image with complex movements (Vanghan, 2004).



**Figure 3: Example of Animation**

### **Audio**

It is speech, music, or any other sound that is stored and produced by computers. It has more advantages than tape recorder. In multimedia, teacher can use more audible vivid and fruitful sound to help students' English learning.



**Figure 4: Example of Audio**

### **Video**

Video refers to as a program, movie, or other visual media product featuring moving images, with or without audio, which is recorded and saved digitally or on videocassette. Compared with animation, video can offer more vivid information. But it will consume more storage space than animation (Vanghan, 2004).

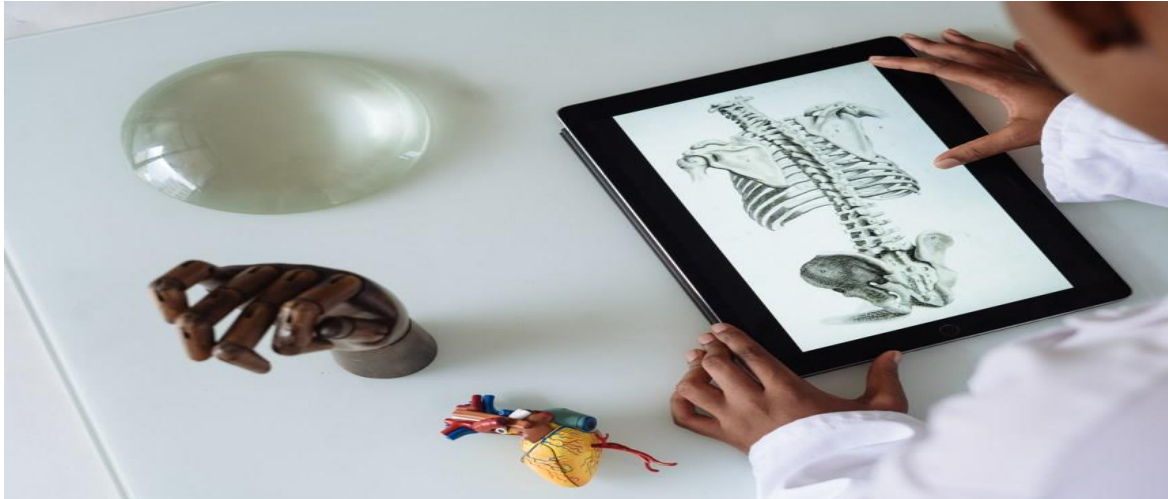


**Figure 5: Example of Video**



### 1.3.3 Usage of Multimedia in Various Fields of Study

**Education:** In education, multimedia could play an important role in the enhancement of education system around the world. With the use of multimedia, difficult topics could be explained with the aid of games, puzzles, animations, graphics, charts, diagram, info-graphics and flowcharts for easy understanding.



Usage of Multimedia in Education

Source: <https://www.chtips.com/computer-fundamentals/uses-of-multimedia-in-different-fields/>

#### Science and Technology

The usage of multimedia in Science and Technology cannot be over-emphasized. This is because it has a wide application in the field of science and technology. It is capable of transferring audio, sending message and formatted multimedia documents. At the same time, it also helps in live interaction through audio messages.



Usage of Multimedia in Science and Technology

Source: <https://www.chtips.com/computer-fundamentals/uses-of-multimedia-in-different-fields/>



## Advertising Industry

The usage of multimedia in advertising industry has played a vital role in the field of advertising. This is because in any advertisement, whether print or electronic advertisement, they first are prepared on the computer by using professionals' software's before it is brought in front of the target audiences. The advertisement could be inform of print, radio (audio), video and graphic.



## Advertising Industry

Source: <https://www.chtips.com/computer-fundamentals/uses-of-multimedia-in-different-fields/>

**Medicine:** Multimedia is an immense support for the everyday work of doctors. This is because, it can be employed by doctors to explain a disease course and the treatment stages to the patient through the combination of text, graphics, animation, video and audio.



## Multimedia in Medicine

Source: <https://www.chtips.com/computer-fundamentals/uses-of-multimedia-in-different-fields/>

## Research

In the area of mathematical and scientific research, multimedia is primarily used for modeling and simulation. For example, a scientist can use multimedia to view the molecular model of a particular substance and manipulate it to arrive at a new substance.

### 1.3.4 Multimedia Hardware Requirements

**Central Processing Unit (CPU):** This is an essential part in any computer. It is considered as the brain of compute, where processing and synchronization of all activities takes place. The efficiency of a computer is judged by the speed of the CPU in processing of data. For a multimedia computer a pentium processor is preferred because of higher efficiency.

**Monitor:** The monitor is used to see the computer output. Generally, it displays 25 rows and 80 columns of text. The text or graphics in a monitor is created as a result of an arrangement of tiny dots, called pixels. Resolution is the amount of details the monitor can render. Resolution is defined in terms of horizontal and vertical pixel (picture elements) displayed on the screen.

**Video Grabbing Card:** In order to convert analog video signal to digital signal for processing in a computer, it requires a special equipment called video grabbing card and software because normal computer cannot do it. The video grabbing card translates the analog signal it receives from conventional sources such as a VCR or a video camera, and converts them into digital format.

**Sound Card:** Sound card is an expansion card for producing sound on a computer that can be heard through speakers or headphone. It can translate digital audio signals to analogue ones, and vice versa. A sound card is necessary for hearing sound from your personal computer on wired headphones or speakers, or plugging in a mic with an analogue output.

**CD-ROM:** CD-ROM is a magnetic disk of 4.7 inches diameter and it can contain data up to 680 Megabytes. It has become a standard by itself basically for its massive storage capacity and faster data transfer rate. To access CD-ROM, a very special drive known as CD-ROM drive is required.

### 1.3.5 Multimedia Software Requirements

There are hundreds of software packages that are available for creating multimedia applications. These software packages can cost anything from being absolutely free (normally called freeware or shareware) to anything upwards of £500.

Here is a summary of just a few of these programs.

**Adobe CS4:** Adobe CS4 is a collection of graphic design, video editing, and web development applications made by Adobe Systems many of which are the industry standard that includes:

- **Adobe Dreamweaver:** This is a What You See Is What You Get (WYSIWYG ) web development software that allows users to create websites without using Html, Everything can be done visually. Although it is a hybrid WYSIWYG and code-based web design and development application, Dreamweaver's WYSIWYG mode can hide the HTML code details of pages from the user, making it possible for non-coders to create web pages and sites.
- **Adobe Fireworks:** A graphics package that allows users to create bitmap and vector graphics editor with features such as: slices, the ability to add hotspots etc. for rapidly creating website prototypes and application interfaces.
- **Microsoft FrontPage:** As a WYSIWYG editor, FrontPage is designed to hide the details of pages and HTML code from the user, making it possible for novices to easily create web pages and sites.

- **Apple Quick time:** Quick Time is an extensible proprietary multimedia framework developed by Apple. It is capable of handling various formats of digital video, 3D models, sound, text, animation, music, panoramic images, and interactivity.
- **Photoshop Pro:** Adobe Photoshop, or simply Photoshop, is a graphics editing program developed and published by Adobe Systems. It is the current market leader for commercial bitmap and image manipulation software, and is the flagship product of Adobe Systems. It has been described as “an industry standard for graphics professionals”
- **Microsoft PowerPoint:** PowerPoint Presentations are generally made up of slides may contain text, graphics, movies, and other objects, which may be arranged freely on the slide.
- **Adobe Flash Player:** Adobe Flash (formerly Macromedia Flash) is a multimedia platform that is popular for adding animation and interactivity to web pages. Originally acquired by Macromedia, Flash was introduced in 1996, and is currently developed and distributed by Adobe Systems.

#### 1.4 SUMMARY

In this unit, we have been able to discuss various definitions of multimedia, the components of multimedia and their usage in various fields of study and the hardware and the software requirements of multimedia. Multimedia is becoming the order of the day in today’s world. It is imperative for students to get acquainted with multimedia and be able to take advantage of it

#### SELF-ASSESSMENT EXERCISES

- is defined as computer programmes and products which involve sound, pictures, and film, as well as text.
- \_\_\_\_\_ is used to see the computer output
- The components of multimedia are text, picture, video, \_\_\_\_\_ and \_\_\_\_\_

#### 1.5 GLOSSARY

1. Multimedia is the use of computer to present combined text, graphics, audio and video with links and tools that let the user navigate, interact, create, and communicate.
2. The components of multimedia are text, graphics, audio and video
3. Text is defined as the actual words written in a book, newspaper, blog post, or any other written word.
4. Graphics refers to images and pictures, such as charts, diagrams, and photographs, which cannot move.
5. Animation is the rapid display of a sequence of images of 2-D Or 3-D artwork or model in order to create an illusion of movement.

#### ASSIGNMENT FILE

1. Define multimedia.
2. Explain the different components of multimedia.

3. What are the hardware and software requirements of multimedia?

## 1.6 REFERENCES/FURTHER READING

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## 1.8 POSSIBLE ANSWERS TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT

- i. Multimedia
- ii. Monitor
- iii. Audio and animation

## Unit 2: Concept of Multimedia

## **UNIT STRUCTURE**

### **2.1 Introduction**

### **2.2 Learning Outcomes**

### **2.3 Concept of Multimedia**

#### **2.3.1 Integration of Multimedia Information Resources**

#### **2.3.2 Interactivity of Multimedia Information Resources**

#### **2.3.3 Intelligence of Multimedia Information Resources**

#### **2.3.4 Easy scalability of Multimedia Information Resources**

### **2.4 Summary**

### **2.5 Glossary**

### **1.6 References/Further Reading**

### **1.7 Possible Answer to Self-Assessment Exercise(s) within the Content**

## **2.1 INTRODUCTION**

In the previous unit, you learnt the definitions of multimedia, the components of multimedia, usage of multimedia in various fields of study and the hardware and software requirements of multimedia. In this study, you will learn the concept of multimedia as relate to its integration of information resources, interactivity of information resources, intelligence of information resources, and easy scalability of information resources.

## **2.2 LEARNING OUTCOMES**

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

1. Explain the concept of multimedia
2. understand the integration of multimedia information resources
3. Understand the interactivity of multimedia information resources
4. Have the knowledge of easy scalability of multimedia information resources

## **2.3 CONCEPT OF MULTIMEDIA**

Multimedia combines components such as text, graphics, audio, video and animation with the aid of computer to make the information more attractive and effective. The major concept of multimedia in libraries and information centres is the provision of integration, interactivity, intelligence and easy scalability of components of multimedia such text, graphics, audio, video and animation so as to convey the information resources to its users.

### **2.3.1 Integration of Multimedia Information Resources**

The integration of multimedia involves combination of various components of multimedia such as text, sound, graphics, animation, images and videos into a single information carrier which can be accessed by the users. The integration of different components of multimedia conveys specific information to the users. For instance, text and audio could be integrated together to convey information on the processing of information material in the library from the acquisition section to the shelf. This same information could also be conveyed by integrating picture/video and audio into Compact Disc (CD) or Digital Versatile Disc for the learner. The essence of integration of information resources into multimedia is to enhance the

learning experiences of users. Also, multimedia uses different types of technology in the classroom to enhance learning experiences. This includes a virtual classroom for learners to be actively engaged with learning objectives. The integration of multimedia also creates pathways for differentiated instruction to meet the unique needs of students. Multimedia is a powerful tools in libraries and information centres. It could be used to address the need of lecturers or researchers and the students. Integration of multimedia enables the students or learners to:

**1. Ward-off boredom**

Multimedia is an effective teaching tool because it can help to sustain the interest of the students. However, we must be able to choose the right media to present, and we must also be conscious of the length of the presentation because students have different attention spans.

**2. Engage the senses**

Multimedia presentations can address different kinds of learners. Visual learners may be stimulated by what they see, auditory learners are stimulated by what they hear, and kinesthetic learners are hyped up by what they do, or what they experience.

**3. Activate the imagination**

This could be through storytelling, or audio simulations.

**4. Develop self-directed learning**

Providing sources may encourage the students to study on their own, or even search for more on their own.

**5. Create authentic learning experiences**

This enables individual to learn by engaging in real world problems and working to solve the problems. Students will become creative thinkers, risk takers and problem solvers. They will be able to tackle large problems and solve the problems through critical and analytical thinking.

**6. Develop interpersonal as well as intellectual relationships with peers**

Multimedia fosters interpersonal and intellectual relationship among students. Also, interactions among the students teach them about themselves and about what is needed to fit in with a particular group in the school or classroom. Furthermore, students develop beliefs, orientations, and values that are consistent with their relational environment.

**7. Simulate real world problem-solving**

Integration of multimedia simulates real world problem-solving which is unlike problems that are addressed in the classroom or in a laboratory during an experiment. Integration of multimedia was developed in response to the weaknesses of the traditional directed instruction which is generally teacher-centred. Moreover, the use of videotapes, DVDs and CD-ROMs depict real-life simulations, which make it much more feasible to teach students using real-world situations.

## **8. Discovery and ownership of learning**

The integration of multimedia allows the discovery and ownership of learning by making the students acquire and build knowledge through engagement, experimentation and investigation. The focus of students will be on learning methodical concepts through simulations in a multimedia environment. The rationale behind discovery and ownership of learn is that the materials that students create through inquiry and discovery is better and stronger than what they receive through lecture or direct instruction.

### **2.3.2 Interactivity of Multimedia Information Resources**

Multimedia facilitates human-computer interaction. This enables users to actively choose and accept information resources based on their own thinking, habits or their own wishes, and draw up a path for using the content. Interactive multimedia is any computer-delivered electronic system that allows users to control, combine, and manipulate different types of media such as text, sound, video, computer graphics, and animation. Interactive multimedia integrates computer, memory storage, data, telephone, television, and other information technologies which can be accessed the users. Interactive multimedia may be used in games, education, training, electronic encyclopaedias, travel guides, information presentation, simulation, corporate presentations and in various fields of study. Interaction involves at least two parties—the user and the system. Thus, interactive media shift the user's role from observer to participant.

Furthermore, the interactivity of multimedia enables users to individualize their learning processes. Schwartz and Al-Ajmi and Aljazzaf (2020) noted that the advent of readily accessible computer technology in the 1980s brought new possibilities for its use in education so that learning can learn on their own. Specifically, it allows learning materials to be individualized such that learners can choose their content, determine the level of difficulty and mode of presentation, as well as receive customized feedback, elaboration, and assessment. This individualization of content enabled by interactive multimedia may increase learner engagement, and improve learning outcomes (Almara'beh, Amer and Sulieman. 2015). Traditional forms of media, such as television and radio, originally required no active participation. These forms of media made consumers more passive, giving them no real way to navigate through their experiences except for the ability to change the channel (Kiraly, 2011).

Moreover, the advent of the internet in the 1990s brought more changes. As technology developed, users were given different tools through which interactive media was presented. Access to the internet went from an expensive utility that was available through modem to a wireless tool accessible by the touch of a finger. Computers and laptops became household items and a necessity in the workplace. Also, smartphones began making interacting with media easy and convenient (Slamecka, 2023). A personal computer (PC) system with conventional magnetic-disk memory storage technically qualifies as a type of interactive media. Examples of interactive multimedia systems are the personal computer, cable television services with computer interfaces that enable viewers to interact with television programs, high-speed interactive audiovisual communications systems that rely on mobile phones, mobile app, video games, interactive websites, virtual reality etc.

## **The Influences of Interactive Multimedia Information Resources**

Interactive multimedia has a very significant role in today's world. This is because, it does not only make users to be more active, but it also give them the power to communicate with others with whom they would normally have no contact. It allows the free flow and exchange of ideas and information. Similarly, interactive multimedia has an educational component, making it a very powerful learning tool. It allows students to become more active in their learning experience, more collaborative, and to be more in control of what they are learning. Interactive multimedia has changed the way people usually approach various personal and professional aspects of life, such as looking searching for a job, interviews, going to school, and advertising.

## **Examples of Interactive Media**

- **Social networking sites:** There are various social networking platforms. Some of them are: Facebook, Twitter, Instagram, WhatsApp, and among others are examples of interactive media. These platforms use graphics and text to allow users to share photos and information about themselves, chat, and play games.
- **Video:** This enables the users to control and respond to visual and sound cues on the screen that which is generated by a computer program.
- **Smartphone:** Smartphone allows individual to surf the Internet on every sphere of life.
- **Virtual Reality (VR):** VR gives users a completely immersive experience, allowing them to delve into a world that is an almost carbon copy of reality. The only difference is that this world is digital.

## **Ways of interaction**

For interaction to be possible there is an interface between the users and the computer. Some of these interfaces are as follow:

1. **Command line interface:** A command line interface is a text-based user interface that is used to manage computer files, run programmes and interact with the computer.
2. **Menus:** This is a graphical user interface like Windows or Mac OS which presents a set of options to the user of a computer application in order for the user to find information or execute a programme function.
3. **Natural language:** Natural language is a subfield of linguistics, computer science, and artificial intelligence. It is concerned with the interactions between computers and human language, Natural languages can take diverse forms, such as speech or signing.
4. **Dialogs with inquiries, questions, and answers:** This is an interface between the computer and the users where users can interact with the aid of dialogs. The users are able to make enquires or ask questions and receive answers.
5. **WIMP (Windows, Icons, Menus, Pointers) interface:** This is a type of graphical user interface which denotes a style of computer to human interaction with the use of Windows, icons, menus and pointer.

## **2.3.3 Intelligence of Multimedia Information Resources**



Multimedia provides an easy-to-operate and very friendly interface, making the computer more intuitive, more convenient, friendlier, and more humane. Xin (2021) noted that multimedia provides comprehensive integration of various media such as texts, figures, graphs, videos, cartoons, and sound by using a computer, which allows user interaction in real time through many senses. Multimedia intelligently integrates devices, data, information, media content, and places users in the loop of the system. It makes extensive use of computational intelligence, smart human-machine interfaces, algorithms for data processing and mining, media and content processing capabilities, as well as knowledge extraction and information management techniques.

The intelligence of multimedia information resources enables users to manipulate or interact with content in ways not possible in the past. The combination of diverse computing devices, such as PCs, mobile smartphone and tablet devices with heterogeneous network transmission channels, allows the individual to create, edit, transmit, share, aggregate, personalize and interact with multimedia content in increasingly flexible ways. Intelligence of multimedia information resources focuses on the following:

- Document image analysis and handwriting recognition
- Robotics and machine perception
- Multimodal semantic multimedia analysis
- Music Information Retrieval
- 3D content-based indexing and retrieval
- Virtual environments, visualization and creative technologies
- Context-adaptive computing
- Intelligent data processing and analytics

#### **2.3.4 Easy scalability of Multimedia Information Resources**

Multimedia provides easy scalability of information resources. The scalability of multimedia information resources is its ability to continue to function well even when it is altered in size or volume. Such alteration may mean addition, upgrade or removal of some components. For instance, if the number of users' increases, the system should manages this increase without changes in the system structure or application. Scalability of multimedia information resources is extremely important to be able provide interactive services to users and to maintain the users; the system should work fast, must be reliable all the times and withstand unexpected changes in the number of the users and the amount of data. Scalability also means how fast and accurately the multimedia responds to action. The response should be received in an acceptable time without any errors. These qualities can be measured via system response time, availability and reliability. Response time means the time between the moment when a user gives an input and the moment when a user receives an answer from the system (Korkea-aho, 1995).

#### **Importance of Multimedia**

1. **Attracts Attention:** Multimedia can be used to create an interesting content with multimedia components such as pictures, videos and sound that are useful, inspiring and entertaining to attract the attention.

2. **Demonstrations:** Multimedia is important for demonstration. Multimedia demonstration shows what is done, how it is done, and explains each of the steps as it is taken. For instance, multimedia can be used to demonstrate how to catalog a book, manufacture a car, build a house, and among others.
3. **Interactive simulation:** This is used in the imitation of the operation of a real-world process or system over time. It is used to gain insight into a human or non-human system. It is mostly useful when the real system cannot be engaged, because it may not be accessible or it may be dangerous to engage with. For instance, the study of radiation of computer can be simulated as if it is in the real world.
4. **Motivation:** This plays an important role in multimedia learning. The use of multiple media in course content and presentation enhance learner's motivation.
5. **Representation:** Different components of multimedia can be combined to convey specific information. For instance, text and graphic can be combined together to convey information. Likewise, video and audio can be combined to convey specific information.

## 2.4 SUMMARY

This unit discussed the concept of multimedia as it relates to the interactivity of multimedia information resources, intelligence of multimedia information resources, easy scalability of multimedia information resources and the importance of multimedia. Today, the use of multimedia cannot be over-emphasized in this century. This is because multimedia's integration, interactivity, intelligence and easy scalability in the creation and accessibility of information resources make it an indispensable tool in today's world. There are different types of multimedia. These types will be studied in our next class/session.

### SELF-ASSESSMENT EXERCISE

- i. \_\_\_\_\_ of multimedia is any computer-delivered electronic system that allows the user to control, combine, and manipulate different types of media, such as text, sound, video, computer graphics, and animation.
- ii. Multimedia \_\_\_\_\_ devices, data, information, media content, and places users in the loop of the system.

## 2.5 GLOSSARY

1. The major concept of multimedia in libraries and information centres is the provision of integration, interactivity, intelligence and easy scalability of components of multimedia such as text, graphics, audio, video and animation so as to convey information to users.
2. The integration of multimedia comprehensively processes various components of multimedia such as text, sound, graphics, animation, images and videos.
3. Interactive multimedia is any computer-delivered electronic system that allows the user to control, combine, and manipulate different types of media, such as text, sound, video, computer graphics, and animation.
4. Multimedia provides an easy-to-operate and very friendly interface, making the computer more intuitive, more convenient, friendlier, and more humane.
5. The scalability of multimedia information resources is its ability to continue to work even when some of its components are altered,, often to a great extent.

## ASSIGNMENT FILE

1. Explain the concept of multimedia.
2. What is the importance of multimedia?

### 2.6 REFERENCES/FURTHER READING

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### 2.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT

- i. Interactivity
- ii. Intelligently integrates

## **Unit 3: Types and Features of Multimedia**

### **UNIT STRUCTURE**

#### **3.1 Introduction**

#### **3.2 Learning Outcomes**

#### **3.3 Types of Multimedia**

##### **3.3.1 Interactive Multimedia**

##### **3.3.2 Hyperactive Multimedia**

##### **3.3.3 Linear/Sequential Multimedia**

##### **3.3.4 Non-Linear Multimedia**

##### **3.3.5 Multimedia Learning Presentation**

##### **3.3.6 Self-Learning Multimedia**

##### **3.3.7 Multimedia kits**

##### **3.3.8 Virtual Reality**

#### **3.4 Features of Multimedia**

#### **3.5 Summary**

#### **3.6 Glossary**

#### **3.7 References/Further Reading**

#### **3.8 Possible Answers to Self-Assessment Exercise(s) within the Content**

### **3.1 INTRODUCTION**

In the previous study, you have learnt the concept of multimedia as relates to its integration of media, its interactivity, intelligence and easy scalability. In this study, you will learn the various types of multimedia.

### **3.2 LEARNING OUTCOMES**

At the end of this unit, the students will be able to explain:

1. Interactive Multimedia
2. Hyperactive Multimedia
3. Linear/Sequential Multimedia
4. Non-Linear Multimedia
5. Multimedia Learning Presentation
6. Self-Learning Multimedia
7. Multimedia kits
8. Virtual Reality
9. Features/Characteristics of Multimedia

### **3.3 TYPES OF MULTIMEDIA**

There are different types of multimedia. These are:

#### **3.3.1 Interactive Multimedia**

This is a type of multimedia that gives the users the ability to control, combine and manipulate different components of multimedia such as text, sound, video, computer graphics and animation (Encyclopedia Britannica, 2017). The easiest examples of this multimedia are games and virtual reality. This type of multimedia is perhaps the most interesting and

enjoyable because it allows the users to interact more with it in order to feel the content better. Bass (n.d.) described this type of multimedia as follow:

1. Interactive multimedia is any package of materials that includes some combination of texts, graphics, still images, animation, video, and audio;
2. These materials are packaged, integrated, and linked together in ways that offer users the ability to browse, navigate and analyze the materials through various searching and indexing features, as well as the capacity to annotate or personalize these materials and
3. Interactive multimedia is always "reader-centered." In interactive multimedia, the reader controls the experience of reading the material by being able to select among multiple choices, choosing unique paths and sequences through the materials. One of the key features of interactive multimedia is the ability to navigate through material in whatever ways are most meaningful for individual users.

This type of multimedia is also applicable for students learning. Students are having greater control on how they interact with most textbooks. This is because many textbooks publishing companies have launched digital platforms which shifted attention from printed textbooks to digital learning tools in today's schools.

### **Advantages of Interactive Multimedia**

1. **Reduced learning time:** This can be attributed to the immediate interaction and constant feedback which provides excellent reinforcement of concepts and content. Also, self-paced instruction which allows students to control the pace and content of their learning i.e. more difficult concepts can be repeated or familiar content can be skipped.
2. **Instructional Consistency and Fairness:** Instructional quality and quantity are not compromised as technology-based interactive instruction is consistent and reliable.
3. **Increased Retention:** The interactive approach provides a strong learning reinforcement and therefore boosts content retention over time.
4. **Mastery of Learning:** A good interactive system can ensure the learning of the prerequisites by learners before proceeding to new content. This provides a strong foundation for continued learning and therefore helps to achieve mastery learning.
5. **Increased Motivation:** Immediate feedback and personal control over the content provided by an interactive multimedia system has proven to be highly motivating to learners.
6. **More Interactive Learning:** Interactive systems enable learners to have more responsibility and better control over their learning and this generates a greater interest to actively seek new knowledge rather than passively accept instruction.
7. **Increased Safety:** Interactive multimedia and the simulations provided by interactive multimedia allow the safe study of hazardous phenomena such as dangerous scientific experiments on harmful substances or natural disasters like volcanic eruptions or earthquakes by the learners.
8. **Privacy/ Accommodates Individual Learning Styles:** This system allows for one to one learning and caters to the different learning styles of individuals. The freedom to ask questions repeatedly without embarrassment and the involvement of each individual learner motivates them and reduces the potential for distraction.

9. **Flexibility:** The flexibility comes from the ability to navigate by using a keyboard, mouse or touch screen, through an interactive program and to choose what and how much information we want and when we want it (Khoo, 1994).

### **Disadvantages of Interactive Multimedia**

1. The production of interactive multimedia is more expensive than others because it is made up of more than one medium.
2. It may require an electronic device, which may be relatively expensive.
3. It requires electricity to run, this may add to the cost of its use.
4. It may cause extra noise pollution.
5. Some of the multimedia tools like CD and DVD may easily be broken and get scratched by touching interface.
6. The design of complex and nice graphical interactive systems is difficult and takes longer time.

### **3.3.2 Hyperactive Multimedia**

This is a type of multimedia that has a structure of different interrelated elements that can be controlled by the users. Hyperactive multimedia focuses on the interactive power of computers which makes it easy for users to explore a variety of paths through many information sources. This is as opposed to conventional documents, such as books, that one normally reads one page after the other in the order set by the author. Hyperactive documents are very flexible and allow one to explore information resources according to their own need.

### **3.3.3 Linear/Sequential Multimedia**

This is a type of multimedia that is designed to be presented in a straight way. It is made up of a distinct beginning and end, that is, it has a logical flow from the beginning spot to the end. It is usually intended for display with not much contact or interruption from the audience. This type of multimedia is applicable where audience's contribution is not expected. In this type of multimedia, the creator of the multimedia is in control. The main go of this kind of multimedia is to entertain, transmit knowledge and make the audience familiar with certain topic without any form of distraction. The application areas of this type of multimedia can be found on:

1. A Powerpoint presentation
2. A slideshow of pictures that goes on with a specific direction
3. A storyline/ A movie
4. An anime episode
5. A YouTube video

### **Advantages of Linear/Sequential Multimedia**

1. Audience focuses and give attention to a particular subject matter.
2. The presentation is organized in a logical manner.
3. The presenter is in control of the order of the presentation.
4. It is effective when there is need for the audience to absorb the information.

### **Disadvantages of Linear/Sequential Multimedia**

1. There is minimal or no interactivity in the mode of presentation.
2. The audience has no say on the topic being presented.

### **3.3.4 Non-Linear Multimedia**

Non-linear multimedia is a type of multimedia that is not on a straight line. In this type of multimedia, audience's participation is important. The audience needs to interact with a computer program, as a result of this; it makes the audience to have the control of the experience. The interaction is done in the presence of an interface which allows the audience and the computer to interact together.

The application areas of this type of multimedia can be found on:

1. a website
2. a search engine such as google.com, yahoo.com, ask.com, etc.
3. a DVD menu screen
4. a Youtube Channel
5. drama streaming site

### **3.3.5 Multimedia Learning Presentation**

In this type of multimedia, the audience builds mental representations from words such as spoken text or printed text and pictures. It enables the information materials to be presented in pictorial form such as static graphics, illustrations, graphs, photos, maps, dynamic graphics, animation or video.

### **3.3.6 Self-Learning Multimedia**

This type of multimedia provides platforms for users to study independently. Self-Learning presentation makes use of software which can be used by students to independently study various materials that have been prepared in the independent learning multimedia and which do not need teacher's assistance. Self-learning multimedia is very useful where offline teaching and learning activities in schools are not permitted.

### **3.3.7 Multimedia Kits**

Multimedia kits are a collection of various tools that can be used as learning materials and involve more than one type of media and are organized into a particular topic. A multimedia kit is a package of computer hardware and software that adds multimedia capabilities to a computer. Examples are CDs, cassettes, audio, and still image.

#### **Advantages of Multimedia Kits**

1. Multimedia kits arouse interest of the users. This is because they are multisensory. This means that individual can be taught or learn on more than one media.
2. It allows cooperation. It could stimulate small group of learners/students for project work.
3. Kits have a clear logistics benefit. This is because the kits can be packaged, transported and used outside the classroom, such as in the media center or at home.

#### **Disadvantages of Multimedia**

1. It is expensive. Multimedia kits can be more expensive than other conventional methods.
2. Time consuming. It can be time consuming to produce and maintain the materials.
3. Replacement. The replacement of faulty ones may be frustrating.

### **3.3.8 Hypermedia**

This is an extension of hypertext that supports linking of graphics, sound, and video components of multimedia. It allows users to click images, movies, graphics and other media apart from text to create a non-linear network of information.

### **Purpose of Using Hypermedia**

- ❖ **Browsing:** To enable users to browse, or navigate through the information of interest.
- ❖ **Linking:** To enable users to create their own special connections, or link, within the information.
- ❖ **Authoring:** To enable users to author, or create their own unique collections of information. Also, users are able to adding or linking text, graphics, and audio as they wish.

### **Examples of Hypermedia**

The followings are some of the examples of hypermedia.

1. Links that can view audio.
2. Links that can view images.
3. Links that can view videos.
4. Hypertext links to other locations.
5. World Wide Web (www).

### **Advantages of Hypermedia**

1. It is easy to browse.
2. References to information can be traced in a backward and forward ways.
3. Makes information to be structured in a different ways.
4. It is fun to use.

### **Disadvantages of Hypermedia**

1. The ease of browsing might make users skip through the information materials hastily.
2. The links to other information resources may be broken.

### **3.3.9 Virtual Reality**

This type of multimedia provides a simulated experience which can be similar to or completely different from the real world. Virtual reality uses multi-projected environments to generate realistic images, sounds and other sensations that simulate a user's physical presence in a virtual environment. A person using virtual reality multimedia can look around the simulated world, move around in it, and interact with virtual features or items. This type of multimedia is applicable in entertainment (most especially, video games), education (such as online lectures) and business (such as virtual meetings).

#### **Advantages of Virtual Reality**

- **It is safe:** Virtual reality creates a realistic world without subjecting viewer to actual or imagined danger.
- **It is liberal:** It provides students with opportunities to explore places which are not feasible in the real world.
- **It provides opportunities to explore:** It provides students with opportunity to work on experiment in a simulated environment.

#### **Disadvantages of Virtual Reality**

- **Cost:** The cost of equipment is extremely expensive.



- **Complexity:** The technology is complex and requires adequate skills.
- **Lack of technological skills:** Lack of considerable level of technological skills needed for virtual reality.

### 3.4 CHARACTERISTICS OF MULTIMEDIA

**Very High Processing Power:** To deal with large amount of data, very high processing power is used.

**File System:** File system must be efficient to meet the requirements of continuous media. These media files requires very high disk bandwidth rates. Disks usually have low transfer rates and high latency rates. To satisfy the requirements for multimedia data, disk schedulers must reduce the latency time to ensure high bandwidth.

**File formats that support multimedia:** Multimedia data consists of a variety of media formats or file representation. These format or file presentation include JPEG, MPEG, AVI, MID, WAV, DOC, GIF, PNG, and among others. AVI files can contain both audio and video data in a file container that allows synchronous audio-with-video playback. Like the DVD video format, AVI files support multiple streaming audio and video. Because of restrictions on the conversion from one format to the other, the use of the data in a specific format has been limited as well.

**Input/Output:** In multimedia applications, the input and output should be continuous and fast. Real-time recording as well as playback of data are common in most of the multimedia applications which need efficient I/O.

**Operating System:** The operating system must provide a fast response time for interactive applications. High throughput for batch applications, and real-time scheduling,

**Storage and Memory:** Multimedia systems require storage for large capacity objects such as video, audio, animation and images. Depending on the compression scheme and reliability. Video and audio signals require large amount of memory.

**Network Support:** This includes internet, intranet, LAN, WAN, ATM, Mobile telephony and others. In recent years, there has been a tremendous growth of multimedia applications on the internet like streaming video, IP telephony, interactive games, teleconferencing, virtual world, distance learning and so on. These multimedia networking applications are referred to as continuous-media applications and require high communication latency. Communication Latency is the time it takes for a data packet to be received by the remote computer.

**Software Tools:** For the development of multimedia applications, various software tools like programming languages, graphics software, multimedia editing software, scripting languages, authoring tools, design software etc. are required. In addition, device drivers are required for interfacing the multimedia peripherals.

### 3.5 Summary

This unit discussed different types of multimedia which are interactive multimedia, hyperactive multimedia, linear/sequential multimedia, non-linear multimedia, multimedia learning presentation, self-learning multimedia, multimedia kits and virtual reality with their advantages and disadvantages. The features or characteristics of multimedia were also

discussed. The use of different types of multimedia have the benefits of reducing learning time, providing instructional consistency and fairness, increasing mastery of learning, retention and increasing motivation. Also, multimedia has the potential to improve dramatically dissemination of information resources in libraries. Hence, in our next class, we shall discuss application of multimedia technologies in libraries and information centres.

### **SELF-ASSESSMENT EXERCISE**

1. Mention the various types of multimedia as discussed in this study
2. \_\_\_\_\_ is a type of multimedia that gives the users the ability to control, combine and manipulate different components of multimedia such as text, sound, video, computer graphics and animation
3. \_\_\_\_\_ is type of multimedia, which allows audiences to build mental representations from words such as spoken text or printed text and pictures such as illustrations, photos, animation or video

### **3.6 GLOSSARY**

1. Interactive Multimedia is a type of multimedia that gives the users the ability to control, combine and manipulate different components of multimedia such as text, sound, video, computer graphics and animation
2. Hyperactive Multimedia is a type of multimedia that has a structure of different interrelated elements that can be controlled by the users.
3. Linear/Sequential Multimedia is a type of multimedia that is designed to be presented in a straight way.
4. Multimedia Learning Presentation is type of multimedia, which allows audiences to build mental representations from words such as spoken text or printed text and pictures such as illustrations, photos, animation or video.
5. Self-Learning Multimedia is type of multimedia which provides platforms for users to study independently.

### **ASSIGNMENT FILE**

1. Discuss the different types of multimedia.
2. Discuss the features of multimedia.

### **3.7. REFERENCES/FURTHER READING**

- Bass, R. (n.d.). A brief guide to interactive multimedia and the study of the United States
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### **3.8 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1.
  - i. Interactive Multimedia
  - ii. Hyperactive Multimedia
  - iii. Linear/Sequential Multimedia
  - iv. Non-Linear Multimedia
  - v. Multimedia Learning Presentation
  - vi. Self-Learning Multimedia
  - vii. Multimedia kits
  - viii. Virtual Reality
3. Interactive Multimedia
3. Multimedia Learning Presentation

#### **Unit 4:        Application of Multimedia Technologies in Libraries and Information Centres**

##### **UNIT STRUCTURE**

##### **4.1    Introduction**

##### **4.2    Learning Outcomes**

##### **4.3Multimedia Technologies**

##### **4.3.1   Mobile Phone:**

##### **4.3.2   Social Media**

##### **4.3.3   Internet Facilities**

##### **4.3.4   Laptop/Desktop**

##### **4.3.5   CD-ROMs**

##### **4.3.6   Scanners**

##### **4.3.7   Teaching Courseware**

##### **4.3.8   Computer Aided Instructional Software**

##### **4.3.9   Digital Video Disc (DVD/VCD)**

#### **4.3.10 Interactive Radio and Television Instruction**

#### **4.3.11 Electronic Interactive Board**

#### **4.3.12 Multimedia Projector**

#### **4.3.13 Network Devices**

#### **4.3.14 Random Access Memory (RAM)**

#### **4.3.15 Closed-Circuit Television (CCTV)**

#### **4.3.16 Webcam**

#### **4.3.17 Computer screens**

#### **4.3.18 Microphone**

#### **4.3.19 Peripheral Devices**

### **4.4 Summary**

### **4.5 Glossary**

### **4.6 References/Further Reading**

### **4.7 Possible Answer to Self-Assessment Exercise(s) within the Content**

## **4.1 INTRODUCTION**

Application of multimedia technologies in libraries and information centres have increased in recent times. Multimedia technologies enable libraries and information centres to integrate and manipulate data from diverse sources such as video, images, graphics, animation, audio and text on a single hardware platform for effective and efficient services. Also, multimedia technologies help libraries and information centres to deal with information systems, storage, access, retrieval, dissemination and preservation of information resources. In this unit, you will learn the various applications of multimedia technologies in libraries and information centres.

## **4.2 LEARNING OUTCOME**

At the end of this study, students will be able to explain the various multimedia technologies in library and information centres and their applications.

## **4.3 MULTIMEDIA TECHNOLOGIES**

There are various multimedia technology applications in libraries and information centres. Some of the multimedia technologies in libraries and information centres are as follow:

### **4.3.1 Mobile Phone**

The mobile phone is a multimedia communication device with a level of computing power. It provides a convenient way of delivering and viewing multimedia materials anytime and anywhere. It also provides a wealth of tools to create and edit different media at little or no cost compared to some of the bigger software packages installed on desktop PCs. Some of the benefits of using mobile phone in multimedia include but not limited to the following: communication, photos and video, texting, fashion and self-expression, entertainment, notes and reminders, video in real time, calendars and organization, maps, navigation, and travel and online banking and finance. Figure – illustrates mobile phones.



**Figure 12**

#### **4.3.2 Social Media**

Social media is a computer-based technology which facilitates the sharing of information resources through virtual networks in communities. It is referred to as internet-based platform that allows quick electronic communication of content, such as personal information, documents, videos, and photos among the users. Users connect with social media by means of a computer, tablet, or smart-phone via web-based software or applications. It may take the forms of different tech-enabled activities such as photo sharing, blogging, social gaming, social networks, video sharing, business networks, virtual worlds, reviews, etc. University of South Florida (2022) reported that billions of people around the world use social media to share information and make connections. Social media enables users to communicate with friends and family, to learn new things, to develop their interests and get entertained. Social media sites include blogs, micro-blogs, wikis, social networking sites, photo-sharing sites, instant messaging, video-sharing sites, podcasts, widgets, virtual worlds, among others.

#### **4.3.3 Internet Facilities**

The Internet is the computer network that allows computer users to connect with computers all over the world. The Internet supports storage, searching and transmission of full multimedia data such as audio, video, formatted documents and conventional data. It allows local and wide area users to communicate with one another and to connect with the largest collection of database servers in the world. The Internet has similarity with global telephone in some ways. One of it is that it enables 2-way connection between sites anywhere in the world. But, unlike a telephone conversation, the Internet enables people to communicate in a variety of ways. The communications are not limited to verbal interactions with other people; it is possible to connect to information stored in their computers. Some of the Internet facilities are:

- **E-mail,**

E-mail is an Internet equivalent of postal mail. It is a widely used facility on the Internet. The e-mail offers features such as print, forward, save, and/or reply to messages. It has features such as attach a word processing document, spreadsheet, software program, video, or image file. There are various platforms that offer e-mail; some of the popular ones are Gmail, Yahoo mail, Y mail, etc.

➤ **List Servers,**

List server facility enables the creation of discussion groups so as to share information about common interests. A popular example of list server is LISTSERV. It copies incoming messages sent to the list and forwards them to everyone whose e-mail address is on the group.

➤ **USENET/Newsgroups**

USENET/newsgroup servers usually provide access to groups that are much less selective than those provided by list servers. It provides free and unrestricted access to thousands of topic-based messages that the newsgroups can obtain by using particular newsreader software to make contact to a local computer that acts as a news server.

➤ **File Transfer Protocol (FTP)**

In File Transfer Protocol facility, Internet users can transfer files, documents, software programs, product upgrades, and other types of computer files among computer systems linked to the Internet.

➤ **Internet Relay Chat**

The use of Internet relay chat allows few numbers of users meet together in an online chat group. They can “talk” to each other by keying messages on their keyboards.

➤ **World Wide Web (WWW)**

The World Wide Web is commonly referred to as the Web. It is the world's dominant software platform. It can also be referred to as an information space where documents and other web resources can be accessed through the Internet using a web browser. It is one of the primary tools which billions of people worldwide use to interact on the Internet. Web resources may contain any type of downloadable media and documents which are interconnected by hypertext links formatted in Hypertext Markup Language (HTML). HTML tag displays embedded hyperlinks with Universal Resources Locators (URLs), which permits users to navigate to other web resources. WWW enables not only text but also contains references to images, video, audio, and software components, that are displayed in the user's web browser to provide pages or streams of multimedia content.

➤ **Web Browsers**

A Web browser is a software which allows a computer user to find and view information on the Internet. It interprets the HTML tags in downloaded documents and formats the displayed data according to a set of standard style rules. Web browser can also be referred to as a software programme which presents and explores contents on the World Wide Web. The contents include pictures, videos, and web pages, are connected using hyperlinks and classified with URIs. Examples of web browsers are Google Chrome, Microsoft Edge, Microsoft Internet Explorer, Mozilla Firefox, Opera, Apple Safari and Amazon Silk.

#### **4.3.4 Laptop/Desktop**

##### **3.4.1 Laptop**

A laptop is a personal computer designed for mobile use. It is a small personal computer. Laptops can be folded flat for transportation and have a built-in keyboard and touchpad. A laptop computer is smaller than a desktop computer, generally less than three inches thick, and weigh less than desktop computers. The laptop's size makes it convenient for transportation in briefcases, backpacks, and other bags. Laptop integrates most of the typical components of a desktop computer, including a display, a keyboard, a pointing device and speakers in a single unit. It is powered by electricity through an AC adapter or away from an outlet using a rechargeable battery. Laptop battery can store energy to run for three to five hours. A laptop enables the integration of multimedia components such as text, sound, video, animation and graphics (Figure 13).



Figure 13

##### **3.4.2 Desktop**

A desktop computer is a good option for laptop where mobility is not required. It is a personal computer (PC) that is intended for regular use at a single location. It is designed to lay flat or stand upright on the desk. Most modern desktop computers have separate screens, keyboards and mouse (Figure 14).



Figure 14

#### **4.3.5 Compact Disc Read-Only Memory (CD-ROM)**

CD-ROM is an optical disc containing audio or software data whose memory is read-only. It is a type of computer memory in form of a compact disc that is read by optical means. It has a drive with a low-power laser beam to read digitized data that has been encoded in the form of tiny pits on an optical disk. . CD-ROM Drives are capable of playing audio CDs and reading data on CDs, including Compact Disc Recordable (CD-R) and Compact Disc Re-Writable (CD-RW)(Figure 15).



Figure 15

#### **4.3.6 Scanners**

Scanner is one of the most useful technology tools used in multimedia in libraries and information centres. It consists of a flatbed which may be hand held. The most frequently used scanner for multimedia application is colour flatbed scanner. This scanner provides a resolution of 600 dots per inch (dpi). After scanning a document, it can be converted into a word processing document on the computer with the use of Optical Character Reader (OCR). Examples of scanners are illustrated in figure 16





Source: <https://www.shutterstock.com>

Figure 16

#### 4.3.7 Teaching Courseware

Teaching courseware is software designed specifically for use in a classroom or other educational setting, it contains instructional material, educational software, or audiovisual materials. Courseware is a term used to explain software resources which are used as Computer-Assisted Learning. Mostly, it is an educational material which is intended as kits for teachers or as tutorials for students and it is usually packaged for use with a computer. Some of the teaching courseware include material for instructor-led classes, material for self-directed Computer-Based Training (CBT), websites that offer interactive tutorials, material that is coordinated with distance learning, such as live classes conducted over the internet and videos for use individually or as part of classes. CD-ROM is the most common means of delivering courseware which is offered in offline mode.

#### 4.3.8 Computer Aided Instructional (CAI) Software

Computer-Assisted Instruction (CAI) software refers to a software programme, containing instructional material that is presented by means of computer systems. The CAI software is an interactive and can also illustrate a concept through animation, sound, and demonstration. It allows the students to study at their own pace rather than teacher-led or group instruction. Computer-aided instruction is a form of multimedia which uses two modalities concurrently. These are visual learning (pictures, written text, animations, and videos) and verbal learning (spoken narration) as discrete channels for delivering content. This is different from the traditional classroom practice of delivering lectures to students. Multimedia learning can be delivered by a teacher, but is often delivered by a computer running a software application (Bulman & Fairlie, 2016).

#### 4.3.9 Digital Video Disc (DVD/VCD)

DVD is the next generation of optical disc storage technology after CD. It is essentially a bigger, faster compact disc that can hold video as well as audio and computer data. DVD aims to encompass home entertainment, computers and business information with a single digital format, eventually replacing audio CD, videotape, laser disc, CD-ROM, and perhaps

even video game cartridges. DVD-ROM holds computer data read by a DVD-ROM drive hooked up to a computer. DVD-Video is an application built on top of DVD-ROM. DVD-Video holds video programs played in a DVD player hooked up to a TV. The difference between DVD-ROM and DVD-Video resembles that between CD-ROM and audio CDs, including the important point that DVD-Video discs can be played in computers. A DVD is an optical disc storage media format, invented and developed by Philips, Sony, Toshiba, and Panasonic in 1995. DVD originally stood for Digital Versatile Disk, or Digital Video Disk. The acronym was dropped after DVD proved to have more uses than just storing video content. DVDs offer higher storage capacity than Compact Discs but have the same dimensions.

#### **4.3.10 Interactive Radio and Television Instruction**

Interactive radio and television instruction is one of the applications of multimedia in library and information centres. It uses electromagnetic waves for transmitting signals from place to place with radio machines, which are capable of playing radio programs. The electromagnetic waves travel through the air and the vacuum (Dictionary & Encyclopedia, 2004). The radio wave uses simplex mode of transmission, that is, transmission of signal in one direction. One direction transmission refers to program types in which the messages only come through the presenters to the audiences. There is no feedback from the audience. But the interactive radio uses full duplex mode of transmission of signal, that is, transmission of signal in two directions simultaneously. This allows immediate responses from the audiences.

#### **4.3.11 Electronic Interactive Board**

An electronic interactive board is also known as smart digital whiteboards or smart board; it is a large interactive display board in the form of a whiteboard. This can either be a standalone touch-screen computer which is used independently to perform tasks and operations, or a connectable apparatus used as a touchpad to control computers from a projector. Electronic interactive board is used in a variety of settings such as classrooms at all levels of education, in corporate boardrooms and workgroups, in training rooms for professional sports coaching, and in broadcasting studios among others (Poulter, 2012).

#### **Features of Electronic Interactive Board**

- 1. It is a convenient all-in-one design for education:** Interactive flat panel displays is with all in one design, including all functions of smart board, interactive panel, projection, annotation software, speakers and control board. This provides collaborative learning in any classroom so that teachers and students can easily share ideas on the big screen.
- 2. It supports interaction and collaboration:** The interactive flat panel lets students' creativity come to life with easy collaboration from their personal devices. It makes lessons more fun for the students and they can even be connected to virtual webcam to host lessons remotely.
- 3. It has anti-glare 4K panel with vivid images:** This anti-glare 4k panel with vivid image increases focus and reduce fatigue and also enhances students' mood and well-being. Electronic interactive board is illustrated in figure 17.



Figure 17

#### 4.3.12 Multimedia Projector

A multimedia projector is a compact with a high resolution full color projector which is capable of projecting text, images, video and audio content. The typical projector takes input from computers, DVD player, VCR, CD player and storage devices. Multimedia projectors are used mostly in classrooms, offices and gatherings at which multimedia presentations are made. Figure 18 shows picture of a projector.



**Figure 18**

#### **4.3.13 Network Devices**

Network devices are hardware devices that link computer, printers, faxes and other electronic devices to a network. Network devices allow the sharing of text, audio, video, animation and graphic on the network. These devices can also be called physical devices that are required for communication and interaction between hardware on a computer network. There are different types of network devices. These are:

1. **Hub:** This is an electronic device that provides a common connection point for all the computers on a network. It can be used with both digital and analog data.
2. **Switch:** Switch is more intelligent than hub. Switch improves network efficiency and maintains limited routing information about nodes in the internal network and also allows connection to systems like hubs or routers. Switch improves network efficiency over hubs or routers because of its virtual circuit capability. Similarly, switch improves network security because the virtual circuits are difficult to examine with network monitors. Switch can work at any of the Data Link layer or the Network layer of the OSI model.
3. **Router:** Router is a general-purpose device which interconnects two or more heterogeneous networks. They are usually dedicated to special-purpose computers, with separate input and output network interfaces for each connected network. Router has its own Address Resolution Protocol (ARP) module, its own Local Area Network (LAN) address and its own Internet Protocol (IP) address.
4. **Bridge:** Bridge is like a hub in many respects. It is used to connect LAN components with identical protocols. However, bridge filters incoming data packets which are known as frames for addresses before they are forwarded. As it filters the data packets, it makes no modifications to the format or content of the incoming data.

Bridge filters and forwards frames on the network with the help of a dynamic bridge table. The bridge table, which is initially empty, maintains the LAN addresses for each computer in the LAN and the addresses of each bridge interface that connects the LAN to other LANs.

5. **Gateway:** Gateway provides translation between networking technologies such as Open System Interconnection (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP). It connects two or more autonomous networks, each with its own routing algorithms, protocols, topology, domain name service, and network administration procedures and policies.
6. **Modem:** This is a device that modulates or demodulate digital signal to analog signal or vice versa. It can also be referred to as a device that converts analog signal to digital signal or vice versa. A modem converts digital signal into analog signal of different frequencies and transmits it to a modem at the receiving location. The receiving modem also performs the reverse transformation and likewise provides a digital output to a device connected to a modem, usually a computer.
7. **Repeaters:** Repeaters are electronic devices that amplify the signal it receives. They are devices which receive signals and retransmit it at a higher level or higher power so that the signal can cover longer distances; more than 100 meters for standard LAN cables. Repeaters work on the Physical layer.

#### **4.3.14 Random Access Memory (RAM)**

The Random Access Memory is a computer primary memory that is good for graphics, audio and video production and writing multimedia products.

#### **4.3.15 Closed-Circuit Television (CCTV)**

Closed-circuit television is a system that allows you to keep an eye on what is going on in and around your area. The cameras and monitors allow you to view events live, and record the footage for later reference. Closed-circuit television cameras can be used for monitoring the movement and actions of users in the library.

#### **4.3.16 Webcam**

Webcam can be used for video conference and taking pictures of your collection. This can help when you while providing reference services like trying to direct someone to the department he wants to go and to show the collection of the library. The same pictures can be used for advertising the library to the users.

#### **4.3.17 Computer screens**

These are display devices. A computer screen helps to display a large amount of information. It is a device that allows you to see and access a lot of information.

#### **4.3.18 Microphone**

Microphone may be used for recording voice speeches while the speaker can help to output the information that has been recorded. It can also be used to give announcements of the closure of the library in advance rather than the librarian moving from hall to hall in order to pass information to the users in the library.

### 4.3.19 Peripheral Devices

Peripheral devices are the devices that are external to the central processing unit of the computer. Some of them are:

1. **Keyboard:** This is a device that allows entering of data into the computer and for editing the captured data. It can be used to give commands on computer programs. Likewise, it can be used for replying messages sent to the librarian. It helps the librarian a lot on his daily activity of recording names of users who are charging and discharging of information materials in the libraries.
2. **Mouse and Trackball:** Mouse and trackball help users to point to icon, open programmes, and other activities on the screen.
3. **Hard Disc:** The hard disc is useful for processing of graphics, audio and video. It is fast, less expensive and large capacity of hard discs are available in the market. A total of 500GB Hard disc may be recommended for multimedia production.
4. **Magnetic Tapes:** These are plastic ribbons which are usually ½ inch or ¼ inch wide, and 50 to 2400 feet long. Data are recorded on the tape in the form of tiny invisible magnetised and non-magnetised spots on the coated surface of the tape. The tape ribbon is itself stored in reels or in small cartridge or cassette. Four mm digital audio tape is the most widely used type of magnetic tape in multimedia applications in library and information centres. It uses a tape ribbon of 4mm and 60 or 90 meters long enclosed in a cartridge.
6. **Magnetic Discs:** These are thin plates which are made of plastic and usually coated on both sides with a magnetisable recording material. The information written on it can be edited. The information stored can be read many times, without affecting its quality. Floppy disc and hard disc are examples of magnetic disc. Most popular magnetic discs used in multimedia application are Zip disc, Jaz disc, super disc, and among others.
7. **Optical Discs:** These can store extremely large amount of data in a limited space. An optical-disc storage system consists of a rotating disc, which is coated with a thin metal or some other material that is highly reflective. Laser beam technology is used for recording and reading data on the discs hence, they are also called laserdiscs. CD-R, CD-RW, and DVD are forms of optical discs.

### 4.4 SUMMARY

This unit identified and described different multimedia technology application used in library and information centres. The technology such as mobile phone, social media, internet facilities, laptop/desktop, CD-ROMs, scanners, teaching courseware, computer aided instructional software, digital video disc (DVD/VCD), interactive radio and television instruction, electronic interactive board, multimedia projector, network devices, random access memory (ram), closed-circuit television (CCTV), webcam, computer screens, microphone and peripheral devices are veritable multimedia application tools for libraries and information centres. Multimedia technology application in library and information centres is one of the key contributors to the future of libraries and information centres' success. The exploration of multimedia technology will facilitate the use and management of information



material in libraries and information centre. This will be of benefit to the librarians and the library users. In the next class, you will learn about multimedia application in library and information service delivery.

### **SELF-ASSESSMENT EXERCISE**

- i. \_\_\_\_\_ is a technology tool or device that allows the entering of data into the computer and for editing the captured data.
- ii. \_\_\_\_\_ software refers to a software programme, containing instructional material that is presented by means of computer systems.
- iii. \_\_\_\_\_ is software designed specifically for use in a classroom or other educational setting, it contains instructional material, educational software, or audiovisual materials.

### **4.6 GLOSSARY**

1. Multimedia technologies enable libraries and information centres to integrate and manipulate data from diverse sources such as video, images, graphics, animation, audio and text on a single hardware platform for effective and efficient services.
2. Technologies such as mobile phone, social media, internet facilities, laptop/desktop, CD-ROMs, scanners, teaching courseware, Computer Aided Instructional software, digital video disc (DVD/VCD), interactive radio and television instruction and among others are veritable multimedia application technology tools for libraries and information centres.

### **ASSIGNMENT FILE**

1. Mention the various multimedia technology application in libraries and information centres.
2. Describe any 10 multimedia technology applications mentioned in question 1 above.

### **4.7 REFERENCES/FURTHER READING**

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### **4.8 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

- i. Keyboard
- ii. Computer-assisted instruction (CAI)
- iii. Teaching courseware

## **Unit 5:       Multimedia Application in Libraries and Information Service Delivery**

### **UNIT STRUCTURE**

#### **5.1   Introduction**

#### **5.2   Learning Outcomes**

#### **5.3Multimedia Application in Libraries and Information Service Delivery**

##### **5.3.1   Interactive Multimedia Catalogues**

##### **5.3.2   Hypermedia Information Retrieval System**

##### **5.3.3   Multimedia Library Reference and General Collection**

##### **5.3.4   Multimedia Databases**

##### **5.3.5   Multimedia Instruction / Training**

##### **5.3.6   Electronic Library**

#### **5.4   Summary**

#### **5.5   Glossary**

#### **5.6References/Further Reading**

#### **5.7   Possible Answer to Self-Assessment Exercise(s) within the Content**

### **5.1   INTRODUCTION**

For centuries, libraries and information centres have been conditioned to organise, store, preserve and disseminated information materials mainly through printed sources. This is because non-print information materials were not readily available. Now, with multimedia applications of text, picture, sound, and moving image that are available in digital form, libraries and information centres can utilise them for effective and efficient service delivery. There are various multimedia applications in libraries and information centres for service delivery. These are multimedia catalogues, hypermedia information retrieval system, multimedia library reference and general collection, multimedia databases, multimedia instruction or training and electronic library. In this unit, you will learn how these multimedia applications are used for service delivery in library and information centres.

### **5.2   LEARNING OUTCOMES**

At the end of this unit, the students should be able to explain:

- interactive multimedia catalogues
- hypermedia information retrieval system
- multimedia library reference and general collection
- multimedia databases
- multimedia instruction / training
- electronic library which are applicable for service delivery in libraries and information centres

### **5.3   MULTIMEDIA APPLICATION IN LIBRARIES AND INFORMATION SERVICE DELIVERY**

There are various applications of multimedia in libraries and information centres for services delivery. These are interactive multimedia catalogues, hypermedia information retrieval system, multimedia library reference and general collection, multimedia based databases, instruction / training multimedia and electronic library.



### 5.3.1 Interactive Multimedia Catalogues

Interactive multimedia catalogue is an electronic form of catalogue developed by publishers. It is usually distributed in mail order catalogue as information sources, particularly in technical libraries. Library catalogues have been the access point between the library users and the collection. It allows library users to successfully find, identify, select and obtain resources. Tarulli (2012) stated that before using the library catalogue, people often seek information from Google or Amazon, but multimedia catalogues limit the need for users to visit Google before accessing the library catalogue, thus increasing the ability of the library catalogue to aid resources retriever. Interactive multimedia catalogue helps to create conversation between library users. It enables users to benefit from and contribute to shared data.

The benefits of interactive multimedia catalogue are not only for its users but also for the libraries and information centres for effective service delivery. The data trail left by user tagging, reviews and indeed the use of the catalogue itself, illustrates how users interact with the information resources. This means that libraries can effectively rank, relate and recommend more meaningful information that can be used to further improve library collections and services (Bento & Silva, 2013).

The interactive multimedia catalogue for service delivery in libraries and information centres consists of two parts: These are:

1. **Hypertext Catalogue:** The hypertext catalogue contains bibliographical data of books, journals and various others like audio, video, graphics and animation. The hypertext catalogue comprises of a wide-channeled structure of bibliographic data with many crossovers.
2. **Audio and video Catalogue:** The music has to be heard and the videos have to be seen, which means that the multimedia catalogue contains music and video.

### 5.3.2 Hypermedia Information Retrieval System

Hypermedia information retrieval system is a hypertext version of large and comprehensive annotated bibliography of hypertext/hypermedia information. The information materials such as periodicals and online information databases are compiled from various sources. The hypermedia systems use links to connect related information in different types of media which may include text, images, sounds, videos, and among others. The links are connected in non-sequential order to allow user to access the disoriented information.

Hypermedia information retrieval systems can be used for effective service delivery in libraries and information centres through the following ways:

1. **Automatic indexing:** Automatic indexing uses machine power to produce document identifiers that will be used to match with the identifier obtained from queries. Automatically indexing replaces manual work in indexing.
2. **Fast retrieval speed:** Since hypertext systems work interactively, it may not be feasible to keep users waiting for a long time in order to follow a retrieval-link. The response should be as soon as possible.
3. **User controlled results.** Hypertext/multimedia systems are suitable for browsing relatively large number of documents efficiently. This makes the users more involved

in the retrieval process as they are able to judge the usefulness of the retrieved documents. This user involvement also means that the retrieval process may have higher recall and a relatively lower precision.

### 5.3.3 Multimedia Library Reference and General Collection

The huge collection of information in the form of storage devices like CD-ROMs, DVDs, flash drives, and hard disk that is available in digital format and can be presented in multimedia formats. The users can view any subject at any time, based on their information needs. Reference services also involve providing instruction on the use of library resources, through user education. It also includes all the functions performed by the reference librarian to meet the information needs of users in person, by telephone, or electronically and not restricted to answering substantive questions at the reference desk. The reference librarians instruct users on the selection and use of appropriate reference tools for finding information. They conduct researches on behalf of the users and direct users to the location of library resources, and assisting the evaluation of information, and refer them to resources outside the library. Effective reference services in the university libraries can only be achieved with the integration of multimedia services into reference services delivery.

Multimedia library reference and general collection include the followings:

- **Encyclopaedias:** Encyclopedia is a book or set of books that contains facts about many different subjects or about one particular subject. It is arranged for consultation and usually in alphabetical order. An encyclopaedia can also be referred to a reference work or compendium which provides summaries of knowledge either general or special to a particular field or discipline. It is an esteemed source of dependable information compiled by experts, the printed versions found a prominent place in libraries, schools and other educational institutions. Multimedia encyclopaedia was launched by Genre in the 1980s, which was termed the era of the multimedia revolution. The multimedia encyclopaedias were released on CD-ROM by several well-respected encyclopedia publishers and were widely discussed as an innovation which would lead to easier and faster service delivery in libraries and information centres. The multimedia encyclopedia can store huge databases with images, videos, animation, and audio. Users can also print/download information that they need from the encyclopedia. Examples of multimedia encyclopaedias are Encarta, Britannica, Wikipedia, Compton's Encyclopedia, among others.
- **Dictionaries:** These are reference collections. Dictionary refers to reference book which lists words in alphabetical order and gives their meanings. Dictionary provides information about words' pronunciation, grammatical forms and functions, etymologies, syntactic peculiarities, variant spellings, and antonyms. Similarly, a dictionary provides quotations illustrating a word's use, and these may be dated to show the earliest known uses of the word in specified senses. In this era of multimedia, libraries and information centres use multimedia dictionaries for their service delivery. Multimedia dictionaries are packed in CD, DVD and even, on the websites. Example of this is Oxford Dictionary of Media and Communication. This is an authoritative and wide-ranging source providing over 2,200 entries on terms used in media and communication, from concepts and theories to technical terms, across subject areas that include advertising, digital culture, journalism, new media, radio studies, and telecommunications. The entries are extensively cross-referenced, allowing the reader to link related concepts that span different discourses with ease. With highly relevant web links to key essays, images, examples, and websites which

complement the A-Z entries, as well as 'Biographical Notes' with web links to key people, this is a valuable resource for media professionals, postgraduates, academics, and researchers and an eminently practical and user-friendly reference for anyone involved in the world of media and communication (Chandler & Munday, 2011).

Other examples of multimedia dictionaries use for service delivery by libraries and information science centres are:

- 1) **American Heritage Children's Dictionary:** This is a CD-ROM multimedia dictionary which has over 37,000 different word entries in English, 13,000 of which are with real-voice pronunciation, illustrated by 3,500 pictures, animations, and sound effects. It includes a lot of classic multi-level word games and other activities.
- 2) **English Dictionary of Show TV:** It is a web-based multimedia dictionary of English language. Each letter of English alphabet has words illustrated with pictures and pronunciation that is displayed on the window or screen. The purpose of this is to help children learn English as a foreign language.
- 3) **Polish Picture Dictionary for Children:** It is a CD-ROM multimedia dictionary of Polish language for 5-8-year-old children. It includes a list of 1,000 core words and a number of interactive animated word games. It can run under Windows 95 or higher.
- 4) **Amazing Dictionary:** It is a CD-ROM dictionary, including approximately 1,000 entries in English. Each word is accompanied by an animated picture and pronunciation. Many games and learning activities are included. The program runs on Macintosh and IBM compatible computers.
- 5) **Junior Talking Dictionary:** This is a multimedia dictionary including over 1,000 nouns in French, German, Italian, and Spanish, classified into 58 different categories, as diverse as "Ancient History," "Transport," and "The Human Body." For each noun a corresponding picture and pronunciation are given. Over 50 frequently used verbs are included for each language. A child or parent may add new words and record real-voice. It is available on a CD and runs under Microsoft Windows and some other operating systems.

- **Directories:** Multimedia directory permits a user to access a multiplicity of web pages containing lists of people or organizations which are usually arranged alphabetically or geographically or by subject. Directories are used to find names, addresses and other contact information for individuals, organizations and businesses. The multimedia directory has both an online version that are driven by a database and an offline version which uses a linked collection of HTML pages on a web browser without using a database. Libraries and information centres are using directories for services delivery in order to meet the specific needs of their patrons in their reference section.

Examples of multimedia directories are as follow:

1. **Encyclopedia of Associations:** This is a three (3) volumes encyclopaedia with most comprehensive directory of basic information on organizations in the United States. Each listing includes purpose, meeting dates and location and names of publications in addition to officers and contact information. This is available on CD-ROM and the Web.
2. **Telephone books:** Telephone directory is usually called a telephone book or telephone address book, phone book, or the white and yellow pages. It is a listing of telephone subscribers in a geographical area or subscribers to services provided by the organisation that publishes the directory. The purpose

of this telephone book is to allow the telephone number of a subscriber identified by name and address to be found. The government (usually blue) pages can be very useful, as they contain separate listings for city, county, state and federal agencies. The Yellow Pages serve as an index to business area. It is a good source for identifying experts in the community. Telephone directories generally include additional useful information such as street maps, cultural attractions, and events calendars. Libraries and information centre deliver services through out-of-area telephone directory information from Web sites. Information offered includes names, addresses, and phone numbers of both business and residential customers. Additional information may include reverse look-up listings by phone number and address, maps, and driving instructions from one location to another. Examples of multimedia phone directories are Infospace, Switchboard and AT&T.

3. **Idaho Library Directory:** Idaho Library directory has the director's name, library address, hours of operation, phone and fax numbers, e-mail address, and links to the Web site and catalog in the University (Source: <http://www.lili.org/directory>).

- **Yearbooks:** A yearbook is a book which contains information about the events and achievements of the previous year, usually concerning a particular place or organization. It is normally published once a year. Nowadays, yearbooks are made in multimedia form. The multimedia yearbook is a yearbook holding memories of a given time with a given group of people; most commonly is a school year at a particular school which exists in multimedia form. A multimedia yearbook contains text, images, audio, and video. While a traditional paper yearbook may contain a few dozen pages, a multimedia yearbook may contain hundreds or even thousands of pages. The multimedia yearbook can be on either a CD-ROM or a DVD.
- **Electronic Books:** Libraries and information centres utilise electronic book to deliver services to library users. Electronic books which are also known as E-book provides textual information for reading. The electronic books contain a body of text and images suitable for distribution electronically and displaying on-screen in a way like a printed book. They are useful for learning, reading, spelling and word skills. Electronic books allow an instant access to it by downloading it over the Internet. The book can be read on the computer, smartphone, or tablet. An electronic book can be published in different file formats, for instance, plain text, PDF, Rich Text Format, as image files, and others.

#### 5.3.4 Multimedia Based Databases

Multimedia based database refers to a collection of related multimedia data. The multimedia database can also be referred to as collection of primary media data types such as text, images, graphic objects drawings, sketches, illustrations, animation sequences, audio and video. Similarly, multimedia database is the collection of interrelated multimedia data that includes text, graphics such as sketches and drawings, images, animations, video, audio, and among others. The framework that manages different types of multimedia data which can be stored, delivered and utilized in different ways is known as multimedia database management system. Nowadays, a vast number of photographs, artifacts, audio recording and textual material in various collections are available in libraries. Multimedia database helps the

librarians into integrate all information from various forms/sources for day-to-day libraries' archive and service delivery.

**There are areas where multimedia database is applied for delivery of services in the library. They are:**

- **Documents and record management:** Libraries and information centres keep the detailed records of books, journals and other information materials. They also provide access to their information materials.
- **Information dissemination:** Multimedia database is a very effective tool for information dissemination in terms of providing several resources. Example: Electronic books.
- **Education and training:** This can be achieved with the use of Computer-aided learning materials. Education training can be designed using multimedia sources. This is very popular sources of learning.

### **5.3.5 Multimedia Instruction**

The use of multimedia instruction in libraries and information centres for service delivery was initially thought to be very expensive to develop, but the early users of multimedia instruction systems reported overall benefits from the use of the technology. Therefore, various libraries have started using multimedia as a tool to train their staff and the students. Multimedia instruction emerges out of the need to share information and knowledge on the research and practices of using multimedia in various educational settings. Multimedia instruction is a learning environment which contains both words and pictures with the intention to promote learning, such as illustrated textbooks, narrated slideshow presentations, online narrated animations, and educational computer games.

Furthermore, multimedia instruction refers to using more than one medium to communicate information materials/resources in libraries and information centre. This is achieved with combination of audio, visual, and written materials to help people learn new skills to meet their career objectives. The use of multimedia instruction in libraries and information centres gives people different opportunities to participate in the learning experience. The real presentation of information materials and ideas may have influence on how people learn. More so, the modern society with its dependency on electronics has moved beyond the printed pages of textbooks. The multimedia instruction uses a combination of methods that include:

- Lectures in person or online: Learners could watch an online course or read through a supplementary white paper
- Audio instructions: Learners could download the course materials in audio file and listen to it later
- Videos: Course resources could be in video format which the users can watch at their own convenience.
- Hands-on training. Information resources may be presented inform of hands-on training for the user.

### **5.3.6 Electronic Library**

An electronic library which is also refers to as digital library ore-library is a set of information materials available through electronic means by the use of multimedia

technologies which allow for the retrieval, archiving, preservation, and dissemination of those information materials. An electronic library provides information materials in form of text, sound, graphics, and motion video. All data is digitized and the various kinds of data can be merged easily and a high level of retrieval of the information materials can be provided. An electronic Library allows books to be displayed on screen as if they were printed books. It helps in retrieving of books and papers. Electronic library enables the user to display multiple books on a single screen and skip from one part describing an idea to a link describing the same idea within another book. It also enables user to information materials simultaneously and to translate original text, and output text as voice data. Likewise, electronic library enables the production and use of information resources in different formats such as text, sound, graphics, and motion video. This multimedia data is more understandable than conventional books containing only text, diagrams, and tables.

### Functions of Electronic Library

1. **Bibliographic data retrieval:** Bibliographic data retrieval enables library and information users to retrieve books even if some of its title, author's name, publisher's name, publishing year, number of pages, and price are not known exactly. Result of the retrieval could be displayed not only as a list of bibliographic data but also as a list of cover images.
2. **Hypertext retrieval:** Important data and concepts contained in the electronic library are linked to groups of other data which can be located anywhere in the world.
3. **Keyword retrieval:** The keyword retrieval enables the user to retrieve books and papers through user defined keyword.

### 5.4 SUMMARY

This unit discussed multimedia application in libraries and information services delivery. The application of multimedia enables the libraries and information centres to deliver services to its users through multimedia interactive catalogues, hypermedia information retrieval system, multimedia library reference and general collection, multimedia based databases, multimedia instruction and electronic library. The roles of multimedia application in libraries and information centre for service delivery cannot be over-emphasized. This is because it helps the libraries and information centres to provide information from different media on one platform. It enhances high quality service delivery. The emergence of CD-ROMs, CD-Writers and recordable CD-ROMs solve some of the problems of storing and dissemination of information materials in libraries and information centre.

### SELF-ASSESSMENT EXERCISE

1. \_\_\_\_\_ system is a hypertext version of large and comprehensive unnoted bibliography of hypertext/hypermedia information which helps libraries and information centre for effective service delivery
2. The \_\_\_\_\_ can also be referred to as collection of primary media data types such as text, images, graphic objects drawings, sketches, illustrations, animation sequences, audio and video.
3. Library \_\_\_\_\_ have been the access point between the library user and the collection.

### 5.5 GLOSSARY

1. Multimedia catalogues interactive is an electronic forms of catalogues from publishers.
2. Hypermedia information retrieval system is a hypertext version of large and comprehensive unnoted bibliography of hypertext/hypermedia information which helps libraries and information centre for effective service delivery
3. The multimedia database can also be referred to as collection of primary media data types such as text, images, graphic objects drawings, sketches, illustrations, animation sequences, audio and video.

### **ASSIGNMENT FILE**

1. Identify various multimedia applications in libraries and information centre for service delivery.
2. Explain any three as identified in question 1 above.

### **5.6 REFERENCES/FURTHER READING**

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### **5.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Hypermedia information retrieval
2. multimedia database
3. catalogues

**Module 2: Use of Multimedia in Libraries and Information Centres**

- Unit 1:** Rationale for using multimedia technologies in libraries and information centres
- Unit 2:** Resources and services
- Unit 3:** Multimedia presentations
- Unit 4:** Design and production techniques
- Unit 5:** Evaluation of multimedia systems

**Unit 1: Rationale for Using Multimedia Technologies in Libraries and Information centres****UNIT STRUCTURE**

- 1.1 Introduction**
- 1.2 Learning Outcomes**
- 1.3 Rationale for Using Multimedia Technologies in Libraries and Information centres**
- 1.4 Summary**
- 1.5 Glossary**
- 1.6 References/Further Reading**
- 1.7 Possible Answer to Self-Assessment Exercise(s) within the Content**

**1.1 INTRODUCTION**

Multimedia technologies have the potential to enhance information resources processing and transfer in libraries and information centres. Most libraries and information centers' collections of information materials in Nigeria are predominantly dependent on print based. Even though, print based information materials are powerful medium which are having major impact on the development of our highly technological civilization. However, print based information materials have both strengths and weaknesses. The weakness of print based information materials are that they use a single sensory channel; rely on a fixed and linear sequence of presentation; lack of interactivity; absence of built-in editing tools and restriction to single-user mode only (Bailey, 1990). Furthermore, Bailey (1990) suggested that print may no longer be an adequate tool to convey scientific information because modern science like DNA sequences, molecular models, medical imaging scans, brain maps, simulated flights through a terrain, simulations of fluid flow, and so on, can no longer be communicated in print. There are needs to communicate the information materials or resources in the libraries and information centres through the application of multimedia. Multimedia is useful to better information processing, storage and dissemination to its users. Hence, the rationale for using multimedia technologies in libraries and information centres cannot be over-emphasized. In this unit, you will learn the rationales for multimedia technologies in libraries and information centres.

**1.2 LEARNING OUTCOMES**

By the end of this unit, students should be able to explain the various rationales for using multimedia technologies in libraries and information centres.



### **1.3 RATIONALE FOR USING MULTIMEDIA TECHNOLOGIES IN LIBRARIES AND INFORMATION CENTRES**

Several studies revealed the rationales for using multimedia technologies in libraries and information centres. Some of these reasons are indicated as follow:

#### **1. Users' Needs for Variety and Quality of Information**

Multimedia technology not only helps the users in providing information from different media (print, microforms, audio and video) on one platform (integrated), but also saves space, money, maintenance, operational inconveniences, etc. The other rationales of multimedia applications in libraries include helping satisfying different information needs such as reference, enrichment, entertainment, leisure, and among others; meeting various types of information preferences of the users, such as scholarly, scientific, vocational, artistic, recreational, etc. Being in digital format, information can also be accessed by remote users on a network. It also helps in overcoming the barriers of boundaries, proximity and physical capacity of a library to accommodate customers. It is interesting and easy to use over the existing form such as print, microforms, and other analogue formats. Similarly its control and interactivity helps the customers elicits positive attitudes towards the application.

Quality service package delivery is a formidable task for all organization, most especially, libraries and information centre (Gupta, 2003).Mulla and Chandrashekera (2005) studied how digital information provisions have boosted a fundamental change in library and information services. The main advantage of a digital format is the flexibility in combining, transmitting, manipulating and customizing the elements of the multimedia according to the needs of the users. Basically, a multimedia system will have a powerful PC with high-end graphics processor, a sound card (to play and record sound), CD drive, and multimedia extensions and drivers for playing digital audio and video (Ramaiah, 2008).Information service delivery is concerned with producing and disseminating data, products and services that are fit for a purpose and relevant to user needs.

#### **2. Increase Learning Efficiency**

Several studies show that computer-based multimedia can improve learning and retention of material presented during a class session or individual study period, as compared to “traditional” lectures or study materials that do not use multimedia. Most of the libraries are using multimedia resources for reference service and instructional purpose as well as in training using tutorial packages. For instance, multimedia tutorials are available on how to do online searching, how to use Boolean operators, how to decipher bibliographic citations as well as guide for performing a virtual tour for electronic library (VIKO 2012). Cell phones now have many features as the computer so they provide multimedia applications as well. Therefore the libraries and information centre are the ultimate place for the students to supplement their class room teaching. The main objective of library is to become instrument of instruction. Therefore library must become the integral part of teaching programme. Recent trends in education students are very interest to learn their subjects and other general awareness are in digital forms, so libraries should make their services through digital environment.

Multimedia resources as document surrogates and as significant knowledge sources in a library need no emphasis. At present, libraries are setting the educational videos, instructional visual aids and audio learning resources form a significant collection. Time is fast catching up the world over that the traditional forms of

collection development techniques and collection maintenance strategies need replacements with the upcoming trends in the profession. The evolution of multimedia has made it very possible for learners to become more involved in their work. With multimedia technologies, they can create multimedia applications as part of their project requirements. This would make them active participant in their own learning process, instead of just being passive learners of the educational content.

### **3. Multi-sensory Input**

One of the rationales for using multimedia technologies in libraries and information centres is because of it is multi-sensory input, that is, the ability of multimedia technologies to stimulate the many senses of the audience. It is interactive, enabling the end users of the multimedia technologies to control the content and the flow of information. This helps to meet information preferences of the users' scholarly, scientifically, vocationally, artistically, recreationally, and among others. Similarly, multisensory integration which is also known as multimodal integration, is the study of how information from the different sensory modalities like sound, touch, smell, self-motion, and taste, may be integrated as a multimedia system (Stein, Stanford & Rowland, 2009)

### **4. Enhanced Networking and Resource Sharing**

Majorly, multimedia technology enabled a single user to interact with several applications. It was not possible to provide viewing and interactive capability to a number of users simultaneously and on demand. Multimedia networking has provided the ability to disseminate information to a wide range of users in educational institutions, libraries, etc. in order to inform and train large number of users in uniform and consistent manner information technology application serves different purposes, such as knowledge sharing-portal, search engines, public administration, social service and business solution. Multimedia networking provides the skills needed to set up, troubleshoot and maintain computer systems configured for a visual communication and computer graphics environment.

### **5. Real-time**

The audio, moving video, animation in multimedia information are closely linked to time, and the integrated process of their presentation and interactivity is real-time. When one of the main content is displayed, its audio-visual information is synchronous. Real-time multimedia technology offers opportunities such as distance learning education, virtual reality, entertainment and video/audio conferencing through live broadcasting from audio stations or online chatting and other real-time broadcasts. This is desirable for libraries and information centres' professionals and users

### **6. Editable**

The key technology of the multimedia is digital high-compression and decompression technology. Digital information is easy to copy and modify, including the audio (language, sound), graphs (static and dynamic), text and so on, which can be edited flexibly through the digital compression. This makes the multimedia technologies desirable in libraries and information centres.

### **7. Ease of the Use of Information**

The users can use information according to their own needs, interests, task requirements, preferences and cognitive characteristics, and take graphs, text, audio and other information forms freely.

#### **9. It Makes Learning Situated and Personal**

Multimedia technologies enables users to have easy to access information from within the libraries and information centres an around the world. Users such as students and the library community can subscribe to libraries and information centres' Twitter and blog feeds and enable them on their mobile devices, if possible. Or, have them use a Twitter aggregator, such as Tweet deck, to stay on top of news announcements such as new arrival of information materials or resources

#### **10. Effective Teaching Materials**

The use of multimedia applications to make presentations on a particular subject helps to encourage students to learn particular subjects effectively. These presentations combine various media elements. Multimedia applications with learning platforms are programme to simulate different situations and help students to understand difficult subjects easily. It helps students to understand the most relevant parts of that subject. Also, multimedia applications helps users to prepare teaching materials in less time than it would take without the use of such applications.

#### **11. It Reduces Psychological Barriers**

Multimedia platforms help one to learn difficult topics easily and effectively, as they allow feedback to be given soon after the user gives an answer or completes a task. Additionally, in the traditional learning environment, the effectiveness of a lesson depends on the performance of the lecturer and his or her teaching strategies. A multimedia learning platform gives users the chance to learn and practice the selected subject repeatedly until they become experts.

#### **12. Quality of Teaching and Expanded Education for its Users**

Most of the people believe that multimedia applications can wipe out humans from current traditional in-class teaching activities. However, this is not true. In reality, a more stable environment will be achieved with the use of multimedia applications. Negative influences, which affect teachers' psychology, will be decrease and teaching quality will be enhanced with the help of these multimedia applications. Additionally, users will be able to learn at any convenient time and under any circumstances using these applications (Vaughan, 2008).

#### **13. Learning and Quick Feedback**

Multimedia applications can be effective in the teaching role, as it is programme to give quick feedback to its users/students. In traditional classroom teaching, learning efficiency depends on the mood of the teacher as well as the teaching methods used. Multimedia applications used for educational purposes, provide opportunities to learn and practice continuously.

#### **14. Tangible Understanding**

Multimedia applications used for educational purposes include solid ideas and several concepts that aid the lecturers or teachers to conduct their class using image presentations, texts, numbers, and presentations in sequence. These applications can be used to develop a

demonstrative model, which can be used for practical training purposes. Multimedia applications allow students to use this application at their convenience.

### **15. Deeper Understanding**

Another rationale for the application and use of multimedia technologies in libraries and information centres is that it takes advantage of the human's brain ability to make connections between verbal and visual representations of content, leading to a deeper understanding. This in turn supports the transfer of learning to other situations. All of this is important in today's 21st century classrooms, as students are being prepared for a future where higher-level thinking, problem solving and collaborative skills will be required (Reddy & Vijayalakshmi, 2020).

### **16. Improve Problem Solving**

A larger percentage of the human brain dedicates itself to visual processing. Thus, using images, video and animations alongside a text may stimulate the brain and students' attention and retention could increase. In a multimedia learning environment, students could identify and solve problems more easily compared to the scenario where teaching is made possible only by textbooks in the libraries and information centres (Reddy & Vijayalakshmi, 2020).

### **17. Increases Positive Emotions**

According to psychologist Barbara Fredrickson, experiencing positive emotions makes people see more possibilities in their lives. Hence, the use of multimedia during instructions may impact students' mood during the learning process and with a positive attitude the students or the users learn better and more proactively (Reddy & Vijayalakshmi, 2020).

### **18. Multimedia Technologies Enables Access to a Vast Variety of Information**

With computers, tablets, smart phones and the internet, students are today better equipped than ever to search and find the information they need (Reddy & Vijayalakshmi, 2020).

### **19. Multimedia Technologies Help Users to Visualize Difficult Concepts**

Lecturers can use Jing software to record a screen shot or video, which produces a video tutorial or information about a website, embed the video on their website or sending it to the student as an email attachment. These types of software provide a great way for teachers to make the most out of their multimedia and online resources (source: <http://www.globalgridforlearning.com/10-reasons-to-use-multimedia-in-the-classroom>).

### **20. It Makes Learning to be Alive through the Viewing and Creation of Audio and Video Instruction**

Libraries and information users could view videos and television programs available online to stay up to date on current events in their fields of study. They could also create their own videos and share them with another class, comparing cultural norms and addressing other's questions through a group blog or wiki (source: <http://www.globalgridforlearning.com/10-reasons-to-use-multimedia-in-the-classroom>).

## 1.4 SUMMARY

This unit examined the various rationales for using multimedia technologies in libraries and information centres. The rationales such as ability to edit, users' needs for variety and quality of information, increased learning efficiency, multi-sensory input, enhanced networking and resource sharing, real-time, ease of the use of information, and among others were considered. Nowadays many libraries and information centres in under developed and developed nations are taking advantage of multimedia technologies. This is because multimedia technologies enable libraries and information centres to create their own content to support the teaching and learning in higher institutions. Multimedia technologies have the potential to be a powerful educational tool for libraries and information centres. The rationales for the application and use of multimedia technologies in libraries and information centres cannot be overemphasised. If libraries and information centres are not using the multimedia technologies in the provision of information resources and services, they will deny themselves and their users the benefits inherent in multimedia technologies. Hence, the use of multimedia technologies in libraries and information centres should be strengthened.

### SELF-ASSESSMENT EXERCISE

1. The information materials in most libraries and information centers in Nigeria are predominantly \_\_\_\_\_ based.
2. The weakness of print based information materials is that they use a \_\_\_\_\_ channel.
3. One of the rationales for using multimedia technologies in libraries and information centres is its \_\_\_\_\_ input

## 1.5 GLOSSARY

1. Print based information materials may no longer be an adequate to convey scientific information because modern science like DNA sequences, molecular models, medical imaging scans, brain maps, among others.
2. There is need to communicate the information materials or resources in the libraries and information centres through the application of multimedia.

### ASSIGNMENT FILE

Discuss 10 rationales for using multimedia technologies in libraries and information centres.

## 1.6 REFERENCES/FURTHER READING

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## **1.7 POSSIBLE ANSWERS TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Print
2. Single sensory
3. Multi-sensory

## Unit 2: Resources and services

### UNIT STRUCTURE

- 2.1 Introduction
- 2.2 Learning Outcomes
- 2.3 Multimedia Resources and Services
  - 2.3.1 Various Multimedia Resources
- 2.4 Summary
- 2.5 Glossary
- 2.6 References/Further Reading
- 2.7 Possible Answer to Self-Assessment Exercise(s) within the Content

### 2.1 INTRODUCTION

Multimedia resources are a major part of non-print materials in the library. Most libraries have been building their collections with multimedia resources. Multimedia resources were built up in libraries and information centres to serve users in educational institutions. In this unit, you will learn the various multimedia resources in libraries and information centres.

### 2.1 LEARNING OUTCOMES

At the end of this class, students should be able to explain various multimedia resources and services

### 2.3 MULTIMEDIA RESOURCES AND SERVICES

Multimedia resources found in libraries and information centres are in form of photographs, filmstrips, maps, slides, motion picture films, LP records, audio spools, audio and videotapes, laserdiscs, video discs, computer-based training materials (CBTs), Web-Based Training materials (WBTs), illustrations, and among others. Majority of these multimedia resources require dedicated devices like computers, mobile phone, CD and DVD drives before they can be consulted. Let us examine each of them.

#### 2.3.1 Various Multimedia Resources

1. **Encyclopaedia:** Libraries and information centres have encyclopaedia resources in their collection for library services. Examples include Crompton's interactive encyclopaedia, Britannica Video CD and World Book Multimedia Encyclopaedia.
2. **Electronic Dictionaries:** Electronic Dictionaries are multimedia resources in libraries and information centres. These dictionaries include Oxford English Dictionary and the Dictionary of Living World.
3. **E-books:** A book composed in or converted to digital format for display on a computer screen or handheld device. The e-books are in different formats. These formats include Adobe PDF, Microsoft Reader, e-Reader, Mobile pocket Reader, EPUB, Kindle and iPad1.

4. **Indexing and Abstracting Databases:** Indexing and abstracting databases are reference sources which provide bibliographic information about journals as well as abstracts of the articles.
5. **Full Text Database:** Full text databases are an organized collection of information of a particular subject or multidisciplinary subject areas. Information materials within the databases can be searched and retrieved electronically in libraries and information centres.
6. **Videos and DVD:** Videos and DVDs are held in libraries and information centres as multimedia resources. They are usually available in the libraries on request. Staff and students can request DVDs and videos for pick-up from the reservation shelf at the libraries. DVDs and videos are not normally taken out of the libraries.
7. **Microfiche:** This is a card made of transparent film used to store printed information in miniaturized form. To read the card, one places it under the lens of a microfiche reader machine, which magnifies it (Figure 19).

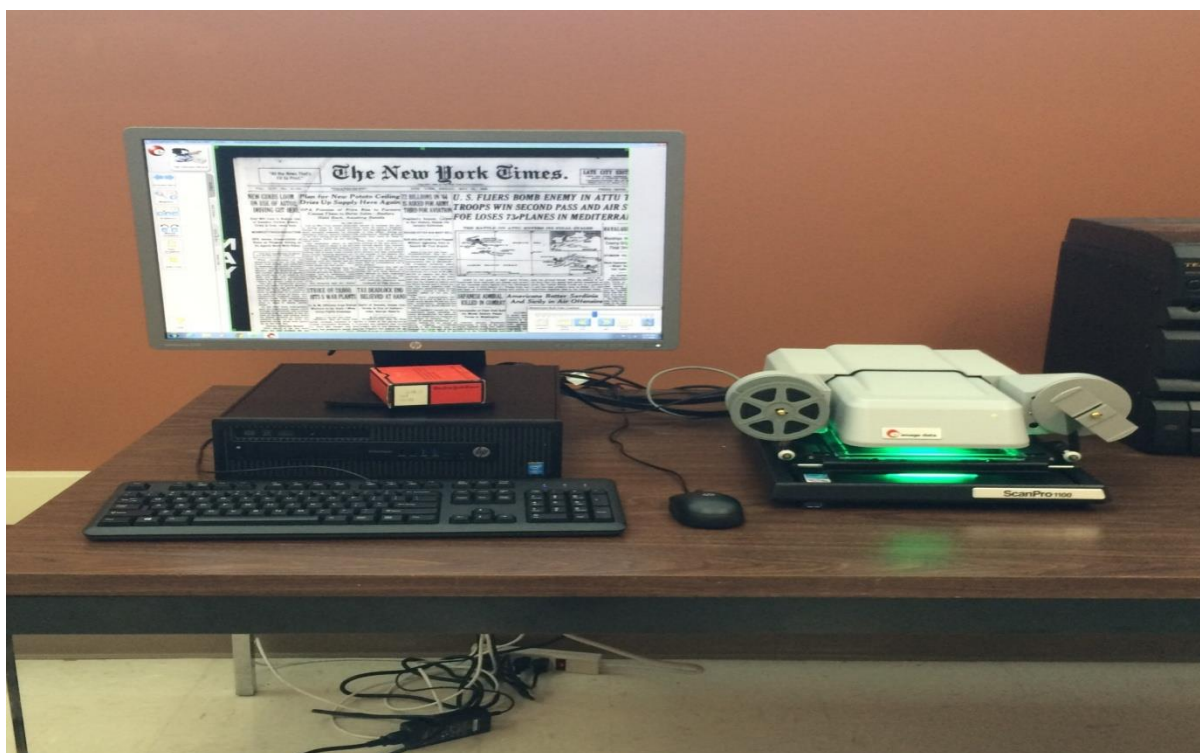


Figure 19: Microfiche resource

9. **Microfilm:** This is a multimedia resource that contains microphotographs of a newspaper, catalogue, or other documents. Microfilm is referred to as an analog storage medium which uses film reels that are exposed and developed into photographic records. It is used to store paper documents like periodicals, legal documents, books and engineering drawings. It is compact in nature and requires smaller storage space than paper documents, hence, it is considered to be a good archival resources in libraries and information centres. The advantages of this resource are that it is much stronger, more reliable, less breakage and useful for long-



term storage needs. Also, the cost and maintenance is lower compare to other form of multimedia resources (Figure 20).



Figure 20: Microfilm

10. **Filmstrip:** Filmstrip is a length of film which contains still photographs, diagrams, charts, an among others that are arranged in sequence for projection and used as a teaching aid. This is also referred to as a series of still pictures on one roll of film. It is ease to operate. It allows a picture to be held on the screen as long as you need to talk about it (Figure 21).

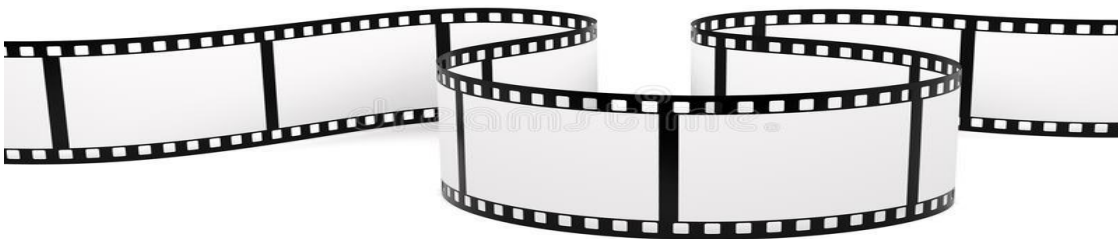


Figure 21: Filmstrip

11. **Aperture card:** It is a type of punched card with a cut-out window by which a chip of microfilm is mounted. It is used for archiving or for making multiple inexpensive copies of a document for ease of distribution. The card is normally punched with machine-readable metadata associated with the microfilm image, and printed across the top of the card for visual identification. It may also be punched by hand in the form of an edge-notched card. Aperture cards have, for archival purposes, some advantages over digital systems. Bryant (2015) stated that aperture cards are used for engineering drawings. The card has a 500-year lifetime. It is not expensive and there is no risk in converting it from one digital format to another (Figure 22).



Figure 22: Aperture Card

12. **Projector:** This is devices which takes images generated by a computer or CD/DVD player and reproduce them by projection onto a screen, wall, or another surface. Mostly, the surface projected onto is usually large, flat, and lightly colored. For instance, you could use a projector to show a presentation on a large screen so that everyone in the room can see it. Projectors can produce either still (slides) or moving images (videos). Projector is useful for Powerpoint presentation at a meeting, projecting a computer screen to teach students in school, projecting a TV or computer with a movie playing to a large screen and to transform a wall, house, or another object to give it a different appearance.
13. **Tape Recorder:** A tape recorder which is also known as a tape deck, tape player or tape machine, is a sound recording and reproduction device that records and plays back sounds from a magnetic tape storage. Tape recorder devices include reel-to-reel tape deck and cassette deck that uses a cassette for storage (Figure 23).



Figure 23: Tape Recorder

14. **Digital Audio Device:** A digital audio is a technology that is used as multimedia resource and service in library and information centres to record, store, manipulate, generate and reproduce sound using audio signal that has been encoded in digital form. It can also be referred to as a sequence of discrete sample that is taken from an analog audio waveform. A digital audio device allows the compression, storage, processing, and transmission of audio information resources. The conversion of audio to a digital format allows convenient manipulation, storage, transmission, and retrieval of an audio signal. This is unlike analog audio which makes copies of recording results in generation loss and degradation of signal quality, digital audio allows an infinite number of copies to be made without any degradation of signal quality.
15. **Digital Camera:** This is a device that captures photographs in digital memory. Majority of cameras produced today are digital cameras. The digital cameras are mostly replacing the cameras that capture images on photographic film. Digital cameras are now widely incorporated into mobile devices like smart-phones with the same or more capabilities and features of dedicated cameras. Digital cameras are able to display images on a screen immediately after they are recorded, these images may be stored into memory storage. Many digital cameras can also record moving videos with sound. Some digital cameras can crop and stitch pictures and perform other elementary image editing (Figure 24).



Figure 24: Digital Camera

## 2.4 SUMMARY

This unit deals with multimedia resources and service in libraries and information centres. The kinds of multimedia resources available in libraries and information centres include CD-ROMs; video discs (VD); audio and video cassettes; web and databases. Many libraries have converted their reference books such as encyclopaedias, dictionaries, handbooks, among others, from print to multimedia formats. Hence, libraries have a choice of using either print or multimedia resource. For instance, Library of Congress, National Film Archive in Britain and the United States National Archives' collection are in form of non-print resources which function as national heritage multimedia resources. Multimedia resources are acquired by libraries and information centres to serve users in educational institutions and other information users. Libraries and information centres are setting up educational videos, instructional visual aids and audio learning resources as part of their multimedia resources and services. The majority of multimedia resources and services in libraries or information centres are video resources, audio recordings, computer-based training materials (CBTs), Web-Based Training materials (WBTs), illustrations, photographs among others. Multimedia resources and services help libraries or information centres to satisfy various information needs of their users. Unlike the print resources which are single sensory channel, rely on a fixed and linear sequence of presentation, lack interactivity, built-in editing tools are restricted to single-user mode only, multimedia resources and services are multi sensory channel in nature, interactive, have built-in editing tools and do not rely on a fixed and linear sequence of presentation. In the next unit, you will learn multimedia presentation.

## SELF-ASSESSMENT EXERCISE

1. \_\_\_\_\_ is a multimedia resource that contains microphotographs of a newspaper, catalogue, or other document.
2. \_\_\_\_\_ is a length of film which contains still photographs, diagrams, charts among others that are arranged in sequence for projection and used as a teaching aid.
3. \_\_\_\_\_ are devices which takes images generated by a computer or CD/DVD player and reproduce them by projection onto a screen, wall, or another surface.

## 2.5 GLOSSARY

Multimedia resources found in libraries and information centres are in form of slides, motion picture films, videotapes, laserdiscs, video discs, computer-based training materials (CBTs), Web-Based Training materials (WBTs), illustrations, and among others

## ASSIGNMENT FILE

Discuss 10 multimedia resources in libraries and information centre.

## 2.6 REFERENCES/FURTHER READING

Bakhshi, S. I. (2013). Organization and use of multimedia resources in Indira Gandhi national centre for arts and Desidoc, Delhi: a comparative study. Retrieved from: <http://hdl.handle.net/10603/12961>

Bryant, J. (2015) .Aperture Card Scanning. Micro Com Seattle. Retrieved 17 June 2022.

## **2.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Microfilm
2. Filmstrip
3. Projectors

## **Unit 3:       Multimedia presentations**

### **UNIT STRUCTURE**

#### **3.1   Introduction**

#### **3.2   Learning Outcomes**

#### **3.3Multimedia Presentation**

##### **3.1.1   What is a Multimedia Presentation?**

##### **3.1.2   How to Prepare a Multimedia Presentation**

##### **3.1.3   Multimedia Presentation Software**

##### **3.1.4   Multimedia Presentation Hardware**

##### **3.1.5   Slides Formats for Presentation**

##### **3.1.6   Advantages of Multimedia Presentations**

#### **3.4   Summary**

#### **3.5   Glossary**

#### **3.6   References/Further Reading**

#### **3.7 Possible Answer to Self-Assessment Exercise(s) within the Content**

### **3.1   INTRODUCTION**

A multimedia presentation is a stand-alone presentation that includes information presented with slides, video, or digital representations, it may include sound which might be a narrative, music or sound effects. Multimedia presentation consists of multimedia components such as images, text objects, video clips, and audio streams, presented on a screen. Also, multimedia presentation refers to a speech in which several types of visual and audio aids are combined in the same speech with the help of computer software. Intel Education K-12 Resources (n.d) stated that multimedia presentation uses words, numbers, symbols, images, audio, and video to explain a topic. It is use to explain your topic in a visual and interactive ways. The presentations show and illustrate the main points of topic. During a presentation, you can interpret the main points, give interesting details, and answer questions from your audience. However, an audience can also view a multimedia presentation like a video. Nowadays, multimedia presentation is effective; this is because it uses different types of media to engage the audience. Multimedia presentation is an effective way to capture and sustain the attention of your audience. In this unit, you will learn the procedures for creating multimedia presentation and how to work with multimedia presentation tools.

### **3.2   LEARNING OUTCOMES**

At the end of this unit, the students should be able to explain:

- i.   Multimedia presentations
- ii.   How to prepare a multimedia presentation
- iii.   Multimedia presentation software
- iv.   Multimedia presentation hardware
- v.   Slides formats for presentation
- vi.   Advantages of multimedia presentations

### **3.3   MULTIMEDIA PRESENTATION**

#### **3.3.1   What is a Multimedia Presentation?**

Multimedia presentation is a collection of various components of media which are used to convey information. These components include text, audio, video, images, animation and

other interactive elements like music, charts, graphics, and sound effects. A multimedia presentation is used for different purposes, such as marketing, training, or teaching. Also, multimedia presentations are frequently used in corporate settings to communicate ideas to employees or customers. Likewise, multimedia presentations can be used in board meetings, investor pitches, and other business-related contexts. It can also be used for training in order to teach a new concept. In an academic setting, a multimedia presentation is used to explain complex topics and concepts. The presentation can be shown in classrooms or during lectures to help students learn more effectively. A multimedia presentation can be personalised to meet the needs of any audience. It is appropriate for formal and informal events.

Multimedia presentation is one of the most well-known and effective methods of presenting educational material, most especially in libraries and information centres. Also, it is one of the common points of contact of the student with researchers, lecturers and classmates embodied with various presentations at a conference or in the classroom. Similarly, multimedia presentation is a widely used method of communication between presenter and a large audience. However, how do you prepare the multimedia presentations (Burmistrova & Stupnikova, 2014).

### **3.3.2 How to Prepare a Multimedia Presentation?**

Since you understand a little more about multimedia presentation, let us look at how to prepare multimedia presentation. This involves four (4) stages. These stages are:

**Stage One:** The first stage is to develop a topic or idea for your presentation. Likewise, determine the purpose for presentation and what type of audience you are presenting to. Once you have a topic or an idea, you can now begin to look for materials that are related to your topic or idea. Then, you may now think on how you want to structure your presentation. In the structure of your presentation, make sure that your introduction is appealing, interesting, and capture the viewer's attention. Your introduction is the first thing viewers will see, so, it is good to make a good first impression. Make sure you organise your topic or idea in an appropriate order and ensure a steady flow of information

**Stage Two:** In this stage two, you should choose suitable software (like Microsoft PowerPoint, Google Slides, etc.) which you would like to use to create your multimedia presentation. Make sure you are familiar with the software you choose before you start. If you are not familiar with the software, you can reach out to a colleague or teammate to get assistance.

**Stage Three:** After you might have chosen suitable software, you may begin the design of your presentation. You may start by choosing templates to save time or to create your own templates from the beginning using your own design skills. Then add your text, images, audio clips, and videos to the slides following your outline. You may also add any other elements like animations or sound effects which you want to include in your presentation. In the designing of your presentation, do not overcrowd your slides. You should use a limited number of images and text so that it will not be too difficult to read. Likewise, keep your design short. This is because average person has an attention span of about 20 minutes; therefore, do not go beyond the time allotted for your presentation. It is always better to keep to your presentation timing.

**Stage Four:** At this stage (which is your final stage), you should put finishing touches to your multimedia presentation design. Go over what you have done, check your spellings and

grammatical structure to be sure that everything is correct. Also, you can add a title to each slide at this point if you have not done so. Once your presentation looks good, make sure to save it. That's it; your multimedia presentation is ready now. Please, don't forget to use visual aids in the design of your presentation. This is because visual aids are a vital part of any multimedia presentation. They could help you to explain complex concepts and make your presentation more attractive. Also, make sure you practice very well before your real presentation. It is always good to practice your presentation before hand. This would help you to become more familiar and comfortable with your slides and ensure that everything go on smoothly.

### 3.3.3 Multimedia Presentation Software

These are software used to create multimedia presentation. Some of the software are as follow:

**1. Microsoft PowerPoint:** It is one of the most popular application software use to create multimedia presentations. It is very easy to use. Microsoft PowerPoint installed on your PC, Mac, or mobile device can be used to:

- create presentations from the scratch or a template;
- add text, images, art, and videos;
- select a professional design with PowerPoint designer;
- add transitions, animations, and motion; and
- present your presentation.

**2. Google Slides:** Google slide formerly known as Google Presentations is a free presentation web application. It incorporates virtually all the capabilities of a traditional presentation program, such as Microsoft PowerPoint. It is a free online software that allows users to create presentations with text, images, videos, charts and graphs. Also, it offers the benefit of cloud storage, this means that users' documents are saved automatically, and may be retrieved even if their hard drive or Solid State Drive (SSD) fails. Google Slides have the following features:

- It has the ability to insert images, formatted text, animations, and other media.
- It can use varieties of templates.
- It has the ability to edit transitions between slides.
- It allows collaborative editing for sharing between computers, devices, and other users.

**3. Prezi:** This is web-based application software for creating multimedia presentations. It is similar to other presentation software like Microsoft PowerPoint, nevertheless, it offers some unique features that make it a better alternative. It allows you to create presentations with zoom and motion effects. Also, it is a fee-based subscription. In recent years, it has become popular presentations software in schools and business organisations. If you want to create a presentation that is a bit more eye-catching and engaging, this presentation tool may be for you. Most presentation software use a slide-based approach, where you move back and forth between individual slides. Prezi, however, uses a canvas-based approach. Instead of using slides, Prezi has one very large canvas that your presentation moves around on, zooming in and out to view various frames.

**4. Keynote:** Keynote is used to design stunning and memorable presentation. It comes with the majority of apple devices. You can use apple pencil on your iPad to design diagrams



or illustrations that bring your slides to life. Keynote sets the stage for an impressive presentation. It has a simple, intuitive interface which puts important tools front and center, so that users can easily add beautiful charts, edit photos, and incorporate cinematic effects. Also, it has a rehearse mode which allows the users to practice on the go, with the current or next slide, notes, and clock; all in one view.

**5. Adobe Spark:** This is an online and mobile design multimedia presentation software. It was developed to allow users with no expertise in multimedia presentation design create social graphics, web pages, and short videos with impact. It is excellent software for making high-quality presentations, especially if one is to add visual stories to ones presentation. Spark empowers users to communicate and share stories, without sweating over their computer for hours. Adobe Spark combines three design apps, these are Spark Page, Spark Post, and Spark Video. It helps users create fun social graphics image-rich web pages and professional-looking videos.

**6. Animoto:** This is an online multimedia presentation software which allows the users to design amazing videos for impressive presentations. It can also be referred to as online video software which allows users to design or create and/or share videos using video clips, images, text and music. Animoto enables users to turn their photos, video clips, and music into stunning video masterpieces to share with everyone. It is very fast. If you are a Microsoft PowerPoint user you may find Animoto as a good complement for your PowerPoint presentations. Animoto automatically produces beautifully orchestrated and completely unique video pieces from your own media, including images, sound and videos. It can pick photos, screen shots and text that you want to use and upload them into Animoto using a visual process. Also, it allows the users to arrange their graphic screens in the order they want them to appear.

**7. Emaze:** This is an online presentation software which helps users to create beautiful presentation with embedded music and/or video. Emaze is also referred to as online or web-based presentation creator which can be used to build and edit presentations on any personal computer. It helps users to easily design visually compelling and engaging presentations.

**8. iMovie:** This is Apple's video editing application software which helps users to design, edit, and manage their own trailers, movies, and videos. It enables users to import and edit video clips and use templates and themes the presentation.

**9. PodOmatic:** This is online multimedia presentation software which enables users to find, listen, and create podcasts with audio and images using sound recordings.

**10. Quicktime:** This is a multimedia player and recorder which is free for use and built into the Mac operating system. It's able to play a huge variety of multimedia files, and can be used to record video, audio, or your computer screen.

**11. Screencast-O-Matic:** It is a free and easy-to-use multimedia presentation software for screen capturing and recording screencasts. Users can distribute their recording as a downloadable movie file or make it available online through a Screencast-o-Matic or YouTube account.

**12. Sparkol VideoScribe:** This is multimedia presentation software for automatically creating whiteboard animations.

### **3.1.4 Multimedia Presentation Hardware**

Presenting a slideshow presentation to an audience requires a projection device that is connected to a computer. A projection device is an example of a peripheral device which can provide input to a computer or accept output from a computer. A projection device needs these features to work:

1. **Projection.** The most common type of presentation projection device is the LCD (liquid crystal display) projector. Other types include DLP (digital light processing) and RGB (red, green, and blue) projectors. You can also use a television monitor to display a presentation for a smaller audience. For any kind of projection device, the most important qualities are brightness and resolution. Brightness is measured in lumens, a standard measure of light. More lumens mean a brighter picture that is easier to see. Resolution is measured in pixels, an abbreviation of picture elements. More pixels mean a clearer and sharper image.
2. **Universal serial bus (USB):** Projectors and other peripherals must be connected to a computer to provide input or accept output. In the past, peripherals used various types of connections, such as parallel ports, serial ports, and S-Video ports. Today, USB technology provides a single, high-speed port for any kind of peripheral. USB cables have an A connector that plugs into the computer and a B connector that plugs into the peripheral. As a result, incorrectly connecting a USB device to a computer is nearly impossible. USB devices are also plug-and-play and hot-swappable. Plug-and-play means that a peripheral is configured automatically when you plug the device into a computer. Hot-swappable means you can plug and unplug the peripheral while the computer is running (Source: Intel Education K-12 Resources).

### **3.1.5 Slides Formats for Presentation**

The followings are formats of slides for presentations:

1. Start a new presentation.
2. Put the title of the presentation, your name, and the date on the title slide.
3. Use the Insert menu to create slides from the outline of your work.
4. Make sure all of your main points and supporting points are visible in the presentation.
5. Remember to save your presentation frequently while you work.
6. Review the checklist and make sure your presentation is complete.
7. The people who view your presentation are your audience. Think about your audience and consider where and how they will be viewing your presentation. If necessary, revise the text of your slides to be more appropriate for the audience and location.
8. Use the Edit and Format menus to clean up your presentation.
9. Check with your teacher to make sure you have correctly inserted, edited, and formatted slides from your essay outline into your presentation.
10. Share your presentation (Source: Intel Education K-12 Resources).

### **3.1.6 Advantages and Disadvantages of Multimedia Presentations**

- The utmost advantage of a multimedia presentation is that videos, audios, animation and texts can be used in a single window.
- It enables faster grasping of ideas and concepts than simple oratory explanations.

- Concepts and patterns may be explained more easily using multimedia presentation than just text.
- It can be easily edited to cater to specific training / presentation requirements.
- It is portable. This is because presentation can be prepared on a laptop and carried to venue like class room, seminar or conference. Most venues are equipped with presentation hardware so that presenter does not need to haul additional materials. A laptop could be all he would need to prepare and bring as a presentation.

### **3.4 SUMMARY**

This unit deals with multimedia presentations. Multimedia presentation is a stand-alone presentation that includes information presented with slides, video, or digital representations. It is very useful in class rooms, seminar, conferences, meetings, and among others. However, the benefits of multimedia presentation may be lost if we do not know how to do it. Therefore, this unit examined what a multimedia presentation, how to prepare a multimedia presentation, multimedia presentation software, multimedia presentation hardware, slides formats for presentation and advantages of multimedia presentations. Multimedia presentation offers an occasion for researchers, lecturers and institutions like libraries and information centres to enhance learning, teaching and research by sharing information in multimedia presentation formats. Not only can educators use multimedia to engage students visually, they can also stimulate active learning by embedding interactive content in the presentations. In our next lecture, you will learn multimedia design and production.

#### **SELF-ASSESSMENT EXERCISE**

1. \_\_\_\_\_ refers to a powerful technique that can be used to communicate ideas and messages to an audience.
2. \_\_\_\_\_ is multimedia presentation software for automatically creating whiteboard animations.
3. \_\_\_\_\_ is a free and easy-to-use multimedia presentation software for screen capturing and recording screencasts.
4. \_\_\_\_\_ referred to as online or web-based presentation creator which can be used to build and edit presentations on any personal computer.
5. \_\_\_\_\_ is used to design stunning and memorable presentation.

### **3.5 GLOSSARY**

A multimedia presentation is a stand-alone presentation that includes information presented with slides, video, or digital representations. It may include sound which might be a narrative, music or sound effects.

#### **ASSIGNMENT FILE**

1. What is a multimedia presentation?
2. Discuss seven (7) multimedia presentations software you have learned in this course.
3. Discuss the stages involved in multimedia presentation.

### **3.6 REFERENCES/FURTHER READING**

- Mayer, R. E. (2014). Research-based principles for designing multimedia instruction. In V. A. Benassi, Overson, C. E. & Hakala C. M. (2014). Applying science of learning in education: Infusing psychological science into the curriculum. *Society for the Teaching of Psychology*, 59–70.
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### **3.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Multimedia presentation
2. Sparkol VideoScribe:
3. Screencast-O-Matic:
4. Emaze
5. Keynote

## **UNIT STRUCTURE**

### **4.1 Introduction**

### **4.2 Objectives**

### **4.3 Multimedia Design and Production Techniques**

#### **4.3.1 Multimedia Design Techniques**

#### **4.3.2 Multimedia Production Techniques**

#### **4.3.3 Multimedia Production Team Members**

### **4.4 Summary**

### **4.5 Glossary**

### **4.6 References/Further Reading**

### **4.7 Possible Answer to Self-Assessment Exercise(S) within the Content**

## **4.1 INTRODUCTION**

In unit 3, you learnt multimedia presentation, how to prepare a multimedia presentation, multimedia presentation software, hardware and advantages of multimedia presentation. In this unit 4, you will learn multimedia design and production techniques. Multimedia design is the art of integrating multiple forms of media. It is used in video games, information kiosks, websites and many other interactive applications. Multimedia design requires creativity, artistic as well as programming skills. Multimedia design and production has different stages or lifecycles. The different stages will be examined in the light of Waterfall model.

## **4.2 LEARNING OUTCOMES**

At the end of this unit, the student should be able to explain:

1. Multimedia design techniques
2. Multimedia production techniques
3. Multimedia production team members

## **4.3 MULTIMEDIA DESIGN AND PRODUCTION TECHNIQUES**

### **4.3.1 Multimedia Design Techniques**

Multimedia design requires innovative and technological skills to combine two or more components like text, audios, videos, animations, images, and among others. Internet is perhaps the most commonplace where one might encounter a web page which combines audio, animation, images and text. Different organisations like advertising, marketing, video gaming, education industries are using multiple forms of media to reach wider audiences. Likewise, libraries and information centres are taking the advantages of the multimedia. Hence, the understanding of design and production of multimedia is a desirable one. There are different stages in the multimedia design. These stages, known as a multimedia design life cycle are as shown in figure 25.

Figure 25: Stages in Multimedia Design

### **Stage One: Project conceptualisation:**

Every project begins with a concept. A multimedia project concept is actually the definition of the project. To define the project, the development team and the clients must meet and discuss in order to identify the actual problem which may necessitate the upgrade of an existing system or design of an entirely new one. In this stage the users or the manager realise that a multimedia system is no longer reflective of the existing objectives which may have expanded. This problem could come about due to complaints by users or by formal

review of the multimedia system. So, the designer or analyst examines whether there is a problem and then studies the problem in depth. If there is no clear definition of the problem, there is a possibility that one will stumble in the dark and come up with solutions that will not work. This stage should be to frame the problem correctly. Doing this, one will be able to generate a variety of questions, which in turn give one the different options and ways of thinking about the problem. As a result, there is tendency that more solutions will open up. There are fundamental questions to ask at this stage. These are:

- ✓ What is the real problem that needed to be solved?
- ✓ Who is actually affected by the problem?
- ✓ What are the diverse ways of solving the problem?

These questions can be answered by collecting data through engagement with users during this stage. This data can be interpreted and assigned meaning by multimedia designers. The interpretation given to the questions is concerned with knowing who the users are, their motivations, their context and their needs relating to the particular problem one is trying to solve. Multimedia design and production is only possible when developers have a clear idea of the problem to be solved. There are four basic issues - identifying the client / sponsors / target audience, eliciting their needs / wants, identifying the scope of the project, and understanding the resource limits, and getting authorisation to conduct a feasibility study is given.

### **Stage Two: Planning and Costing**

In this stage, the analysis of the idea is prepared, which can be translated into a multimedia project. This idea can be further refined by outlining its goals and objectives. Before starting to design a multimedia project, it is necessary to plan what writing skills, graphic art, music, video, and other multimedia skills will be required. It is also necessary to estimate the time needed to prepare all elements of multimedia and prepare a budget accordingly. After preparing a budget, a prototype of the concept can be developed.

### **Stage Three: Design Techniques**

Once the project is ready for design, the designing stage starts. The following sub-stages are to be carried out under the design techniques:

- 1. Data gathering:** This involves gathering data from the users and others sources. The gathering of data can be carried out by interview, questionnaire, observation, and among others. The data gather will enable the designer or developer to decide the next line of action
- 2. Navigation map structure design:** This is the technique provided to the viewers for navigating from one place to another in the multimedia project. It is part of the user interface. The success of the user Interface depends not only upon the general design and graphic art but also on the position of interactive buttons or hot spots.  
When we design multimedia we generally work with two types of structures, these are the depth structure which represents the complete navigation map and describes all the links between all the components of your project and surface structure which represents the structures actually realised by a user while navigating the depth structure.
- 3. Media content design:** This the designing of the multimedia contents
- 4. Interface designing:** This involves the structure of the multimedia for navigation.
- 5. Storyboarding:** The storyboard is married to the Navigation maps during the design process. This helps to visualize the information architecture.
- 6. Integration:** This involves the connection of more than one media together.

#### **Stage Four: Testing**

In every project, testing stage ensures that the product to be free from bugs. Apart from debugging, another aspect of testing is to ensure that the multimedia application meets the objectives of the project. It is also necessary to test whether the multimedia project works properly on the planned delivery platforms and meets the needs of the clients.

#### **Stage Five: Delivery**

The final stage of the multimedia application development is to pack the project and deliver the complete project to the end-user. This stage has several steps such as:

- 1. Implementation:** This involves putting the designed multimedia to use
- 2. Maintenance:** This involves keeping the multimedia system into operation so that it will continue to work as planned.
- 3. Shipping and marketing:** This involves the delivery of the multimedia products to the users.

### **4.3.2 Multimedia Production**

Multimedia production refers to any type of production that uses images and a combination of text, audio, and graphics to produce multimedia. There are different states of multimedia production. These are

#### **Stage One: Conceptual Analysis and Planning**

The process of multimedia production starts with a conceptual explosion points. Conceptual analysis identifies an appropriate theme, budget and content availability on that selected theme. Additional criteria like copyright issues also are considered in this phase.

#### **Stage Two: Project design**

At this stage, after the theme might have been finalised, then, the goals, objectives and the activities for the multimedia would be drawn. General statements are termed as goals. The specific statement in the project is known as the objectives. Activities are series of actions performed to implement the objectives. These activities contribute to the project design phase.

#### **Stage Three: Pre-production**

Based on the planning and design, it is necessary to develop the project. The following are the steps involved in pre-production:

##### **1. Budgeting**

Budgeting for each phase like consultants, hardware, software, travel, communication and publishing is estimated for all the multimedia projects.

##### **2. Multimedia Production Team**

The production a high-end multimedia project requires a team effort. The team comprises of members playing various roles and responsibilities like Script writer, Production manager, Editor, Graphics Architect, Multimedia Architect and Web Master.

##### **3. Hardware/Software Selection**

All multimedia applications require appropriate tools to develop and playback the application. Hardware includes the selection of fastest CPU, RAM and huge monitors, sufficient disc for storing the records. Selection of the suitable software and file formats depends on the funds available for the project being developed.

##### **4. Defining the Content**

Content is the “stuff” provided by content specialist to the multimedia architect with which the application is developed, who prepares the narration, bullets, charts and tables etc.

## **5. Preparing the structure**

A detailed structure must have information about all the steps along with the timeline of the future action. This structure defines the activities, responsible person for each activity and the start/end time for each activity.

### **Stage Four: Production**

In the multimedia application, the production phase starts after the pre-production activities. This production phase includes activities like background music selection, sound recording and so on. Text is incorporated using OCR software, Pictures shot by digital camera, video clips are shot, edited and compressed. A pilot project is ready by this time.

### **Stage Five: Testing**

The complete testing of the pilot product is done before the mass production to ensure that everything is in place, to avoid failure after launch. If it's an web based product, its functioning is tested with different browsers like Internet Explorer, Chrome, Mozilla and Netscape Navigator. After the testing process is over, the product is incorporated with valid suggested changes.

### **Stage Six: Documentation**

User documentation is a mandatory feature of all multimedia projects. The documentation has all the valuable information starting from the system requirement till the completion of testing. Contact details, e-mail address and phone numbers are provided for technical support and sending suggestions and comments.

### **Stage Seven: Delivering the Multimedia Product**

Multimedia applications are best delivered on CD/DVD or on a website. In reality various challenges like bandwidth problems, huge number of plug-ins required to play audio and video and long downloading time are encountered while delivering multimedia application through the Internet.

#### **4.3.3 Multimedia Design and Production Team**

Multimedia design and production requires team members. It is usually a not one man business. It involves a team of experts. The following are some of the team members required in the design and production of multimedia products:

- **Production Manager**

In a multimedia production, the role of production manager is to define, and coordinate, the production of the multimedia project with respect to time and quality. The production manager should be an expertise in the technology, good at proposal writing, good communication skills and budget management skills. He/she must also have experience in human resource management and act as an effective team leader.

- **Content Specialist**

Content specialist is responsible for performing all research activities concerned with the proposed application's content. Program content refers to projects information, graphics, data or facts presented through the multimedia production.

- **Script Writer**



Video and film scripts represent a linear sequence of events. The script writer visualizes the concepts in three dimensional environment and if needed uses the virtual reality integration into the program.

➤ **Text Editor**

The content of a multimedia production always must flow logically and the text should always be structured and correct grammatically. Text and narration is an integrated part of the application.

➤ **Multimedia Architect**

The multimedia architect integrates all the multimedia building blocks like graphics, text, audio, music, video, photos and animation using an authoring software.

➤ **Computer Graphic Artist**

The role of Computer Graphic Artist is to deal with the graphic elements of the programs like backgrounds, bullets, buttons, pictures editing, 3-D objects, animation, and logos etc.

➤ **Audio and Video Specialist**

These specialists are needed to deal with narration and digitized videos to be added in a multimedia presentation. They are responsible for recording, editing sound effects and digitizing.

➤ **Computer Programmer**

The computer programmer writes the lines of code or scripts in the appropriate language. These scripts usually perform special functions like developing the software to give the size and shape of video windows, controlling peripherals and so on.

➤ **Web Master**

The responsibility of the web master is to create and maintain an Internet web page. They convert a multimedia presentation into a web page. Thus, the final multimedia product is a joint effort of the entire team. Initially, the production manager identifies the project content, while the web master provides access to a wide range of community through web-services.

#### **4.4 SUMMARY**

In this unit, multimedia design and production techniques were examined. The different stages in multimedia design and production were considered as well as the multimedia production team members. The various stages involve in the design and production should be adhered to in order to produce a multimedia that will stand the test of time. The design and production techniques may be time consuming but all the requirements involve in multimedia design and production techniques should be satisfied so as to produce a quality multimedia product.

#### **SELF-ASSESSMENT EXERCISES**

1. The stages in multimedia design are project conceptualization, \_\_\_\_\_, design techniques, \_\_\_\_\_ and \_\_\_\_\_
2. The stages in multimedia production are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, production, testing, documentation and delivering the multimedia project

#### **4.5 GLOSSARY**

1. Multimedia design requires innovative and technological skills to combine two or more components like text, audios, videos, animations, images, and among others.
2. Multimedia production refers to any type of production that uses images and a combination of text, audio, and graphics to produce multimedia.
3. Multimedia design and production is only possible when developers have a clear idea of the problem to be solved.

#### **ASSIGNMENT FILE**

1. Explain the various stages of multimedia design.
2. Briefly discuss the stages involve in multimedia production.
3. Mention 8 team members in the design and production of multimedia system.

#### **4.6 REFERENCES/FURTHER READING**

#### **4.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. planning and costing, testing and delivery
2. conceptual analysis and planning, project design, pre-production

## **UNIT 5: EVALUATION OF MULTIMEDIA SYSTEMS**

### **Contents**

#### **5.1 Introduction**

#### **5.2 Learning Outcomes**

#### **5.3 Evaluation of multimedia systems**

##### **5.3.1 What is Evaluation of Multimedia System?**

##### **5.3.2 Types of Evaluation of Multimedia System**

##### **5.3.3 Reasons for Evaluating Multimedia System**

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#### **5.4 Summary**

#### **5.5 Glossary**

#### **5.6 References/Further Reading**

#### **5.7 Possible Answer to Self-Assessment Exercise(S) within the Content**

### **5.1 INTRODUCTION**

In the previous unit, you learnt multimedia design and production techniques. In this unit, you will learn evaluation of multimedia. We evaluate multimedia system to test whether the designed and production of the multimedia meant the defined goals and objectives. It is always good to evaluate any system after its implementation. Normally, evaluation is carried out after the designed system has been put to use.

### **5.2 LEARNING OUTCOMES**

At the end of this unit, the student should be able to explain:

1. Evaluation of multimedia system
2. Types of evaluation of multimedia system;
3. Reasons for evaluation of multimedia system;
- 2 Criteria for evaluation of multimedia system by users; and
- 3 Criteria for evaluation multimedia system by professionals.

### **5.3 EVALUATION OF MULTIMEDIA SYSTEMS**

#### **5.3.1 What is Multimedia Evaluation?**

Evaluation is testing whether a designed multimedia fulfills the set goals and objectives, and suggesting any improvements required to make it useful for its target audience. Evaluation can be carried out from the perspective of the users and developers. From the perspective of the users, the subject and content, platform, usability and cost can be evaluated. While the perspective of developer, content, performance, delivery and interface can be evaluated. There are various definitions of evaluation. Scriven (1991) referred to evaluation as a process of determining the merit, worth, or value of something. The author further describe evaluation as a process that appraise, analyze, assess, critique, examine, grade, inspect, judge, rate, rank, review, studies and test. Similarly, Fort *et al.*, (2001) define evaluation as the periodic assessment of the relevance, performance, efficiency and impact of a project in relation to stated objectives. Also, evaluation is the comparison of the condition or performance of something to one or more standards. (Stake, 2004)

For project such as multimedia evaluation is the systematic collection of information about the activities, characteristics, and outcomes of system to make judgments about the system, improve its effectiveness, and/or inform decisions about future systems.

### **5.3.2 Types of Evaluation of Multimedia**

There are two types of multimedia. These are formative and summative evaluations. These shall be discussed as follows:

#### **5.3.2.1 Formative Evaluation**

Formative evaluation is carried out as a constant process in the design and production of multimedia and this may even happen before the design and production process actually starts. Decisions taken at the beginning of the process of multimedia design and production affect various aspects of the multimedia. In formative evaluation of multimedia process, answers to questions like who, why, where, and how become the guidelines for the design and production of multimedia. In order to get the feedback from such questions, both quantitative and qualitative methods of feedback are utilised in formative evaluation. No programme can fulfill all requirements of all learners. In fact, if a particular multimedia provides all the information, and answer all queries on a single topic, it should be considered successful. So, every multimedia developer must decide and delimit the scope of the multimedia beforehand. In other words, we have to spell out the objectives of the multimedia. Some questions need to be answered because they will affect the content of the multimedia resources. These questions are:

1. Who are the target users of this multimedia resources and what is the level of the target users?
2. What is the level of computer familiarity expected of the learners?
3. What content would be covered in the multimedia?
4. How would the useful as a supplement to teaching, learning and research?

#### **5.3.2.2 Summative Evaluation**

Summative evaluation of multimedia refers to the evaluation that determines the worth of a multimedia resource after its design and production. Also, summative evaluation is the assessment of users on the outcome of production of multimedia resources on its usefulness, reliability, validity among others. The goal of summative evaluation of a multimedia resource is to compare it against a standard or benchmark. Summative evaluation tends to elicit information that can be used to determine if a multimedia meets the stated goals and objectives or needs to be modified. The design and production of multimedia can be viewed at two levels. These levels are conceptual and presentation levels. Conceptual design involves unifying the scattered knowledge on the selected area/topic, and creating a learning web. Presentation design deals with the realisation of conceptual framework into a multimedia design and production, which runs on a computer. As we have a number of media available for presenting our content, it is often noticed that designers get tempted to use many of the facilities like screen layout, colour schemes and the detailed use of individual media like the moving pictures, audio, text, and among others.

The objective of the whole effort should be to integrate elements of multimedia into a deep learning architecture. The design and production of multimedia materials should be consistent with theories of learning, teaching and research. There is a wide range of opinions on what constitutes effective multimedia resources, and as a result there is room for summative

evaluation so as to enhance creativity and innovation in the design and production of multimedia resources. Rather than taking a prescriptive approach to design content, presentation and interaction, we consider the issues involved. There are three basic issues namely:

1. **Educational Effectiveness:** The goal and objective of all educational programmes is to have high academic value. To evaluate whether a particular multimedia resources meet the goals and objectives of educational effectiveness, there are some questions that should be asked. These are:
  - Is the content presented in simple and neutral of gender, without ethnic and religious biases?
  - Will the software meet the educational goals, objective and offer good presentation of the content areas?
  - Is the software sound in terms of teaching principles and visuals to enhance the achievement of the programme's educational objectives?
  - Does the software provide higher order thinking skills?
  - Does the software offer simple, precise directions accompanied by picture choices and voice response at the learner's own rate of learning?

## 2. **Entertainment Value:**

One of the main objectives of utilization of multimedia resources is to provide edutainment to the users. One of the major reason multimedia is popular is its capacity to enable learning without struggling. As you design your multimedia, you must be careful and see that the contents offer learning opportunities in a pleasurable learning environment. One should see to it that the multimedia provides adequate flexibility to 'surf' i.e. move around and learn at one's own pace and convenience.

## 3. **User Friendliness of Multimedia Technology:**

The main problem faced by users is lack of familiarity with the technology. Therefore, multimedia developer should endeavor to visualize all the queries that users may have, and provide icon-based information for ease of use. Target users can develop the skills to use the multimedia within reasonable time.

### 5.3.3 **Reasons for Evaluating Multimedia System**

According to Aust and Isaacson (2005), the reasons for evaluation of multimedia resources are to:

1. **improve the multimedia product:** Improving your multimedia educational material is an overarching goal of evaluation. We work under the assumption that a product is never perfect, but that it is nevertheless good enough that it can be revised in order to be used again when you go through the next iteration of the multimedia development cycle. Evaluating in order to make improvements is known as formative evaluation. Even if you can be absolutely sure that the multimedia educational product will not be used again after it has been deployed, going through the evaluation process allows you to refine your critical stance towards the multimedia products that you develop in the future.
2. **help assess the effectiveness of the instructional material:** Judging the effectiveness of your instruction is known as **summative evaluation**. If the multimedia materials form but one component of an educational intervention strategy,

a summative evaluation of your multimedia educational materials can be a part of the larger goal of assessing the effectiveness of the educational intervention.

3. **improve your skills or the skills of your team in instructional media development:** Knowing where you did a good job and where you didn't do as well, and why, are key to your personal development as an instructional designer.
4. **improve the multimedia development process:** The multimedia development process is an idiosyncratic one; the type of clients that you attract, the personalities and abilities of the people in your team, the professional experience you and your team possess, and the resources that are available to you all affect the development process. No development process template can replace repeated *and informed* experimentation with developing multimedia educational materials.
5. **comply with requirements:** One reason that you conduct evaluation is that you have been required to, either by some regulatory body or by your client. Evaluating because of compliance is evaluating instructional multimedia materials to see if they comply with standards or standards-based evaluation is covered later.
6. **contribute to knowledge of evaluation theories and practices:** It is possible that in the process of trying to design your monitoring and evaluation tools, you come up with new and useful theories and practices on educational technology; in this case, you could provide a great deal of benefit to a great number of people if you share your insights to a community of like-minded professionals!

#### 5.3.4 Criteria for Evaluation of Multimedia

Good multimedia resources should fulfill certain criteria. These are presented as follow:

1. **Appropriateness of the Multimedia:** The appropriateness of multimedia is determined by its goals or objectives. The goals or objective is a statement that informs user about what to achieve after using the multimedia. A good multimedia will have an objective statement stated clearly. Objective is important in any instructional material. This is because it supports the expectancy of users. However, a multimedia is deemed suitable if its objective is met. Many multimedia developers list out the objectives, but, if the multimedia fails to meet its objective, then, we can say that it is not a good multimedia. In addition to looking at the objective, the level of information or instructional material that is presented is also important. It must be designed for a specific target group. It should neither be too difficult nor too easy. The information level must be appropriate to the target user

2. **Content Management:** This does not refer to how the content is placed on the screen but how it is presented as multimedia. In content management, among the things that one has to look at are how the content, the examples provided and the exercises are presented in the multimedia. For content, the way the content is organized, the difficulty level, the suitability of the content to the users and the language used are evaluated. The content should be in logical order. It should be organized from easy to difficult with the difficulty level increasing gradually. To avoid the sequential effect in a multimedia presentation, options should be given to the user to choose the difficulty level that fits them. It should suit the target users and be sufficient in quality and quantity. Language that is used should be simple, easy to understand, does not bias to any specific group of people and are not harmful.

3. **Students, instruction and process:** Evaluating your multimedia learning materials at the end of the day is the process of engaging not just with the question of "how well did the students learn?" but also with the question, "How much of the students' learning is due to the multimedia educational materials which have been designed and produced?" You can

evaluate how well students learn by measuring changes in knowledge through assessment or by evaluating how their real-world performance has been affected by the use of multimedia resources. Another area which can be evaluated is how well students use multimedia to generate material.

**4. Usability:** Usability relates to functioning, correctness, perceptual and technological efficiency. The user should be capable of perceiving, viewing, interacting with, and navigating usable multimedia material. Usability is seen as more fundamental than usefulness. This is because if something is not usable, it may not be guaranteed to be useful. Hence, there is need to evaluate the usability of multimedia resources.

**5. Usefulness:** This relates to pedagogical effectiveness, cognitive efficiency, and appeal of multimedia resources to the users. Users can learn from their interactions with useful multimedia material. For a multimedia to be useful, it has to be usable in the first place. There are various techniques for evaluating the usefulness of multimedia. These techniques are as follow:

- Use pre- and post-tests to determine the effectiveness of the multimedia.
- Use users tryouts to determine the effectiveness, efficiency, and appeal.
- Use direct observation to determine the effectiveness and efficiency.
- Talk to users to determine appeal and effectiveness.
- Ask a colleague to review the multimedia
- Ask a colleague to observe how the users use the multimedia during deployment

**6. Interaction of media:** Subjective and objective measurements should be used to evaluate end-to-end quality of each multimedia components of video, audio, television, 3D video among other. Also, the interactions between the media, with particular attention to the audiovisual quality assessment of systems used for videoconferencing and other interactive multimedia services are to be evaluated. The quality levels may be defined by objective or subjective methods in the multimedia and by taking into account the interactions between media.

**7. Transmission errors:** In transmission errors, different questions can be asked in order to evaluate the multimedia. These questions are: What objective methods could be used for in-service measurement and monitoring of transmission systems for such multimedia services in the presence of transmission errors? What new subjective measurement methods should be used to evaluate transmission quality of real time audiovisual services by expert observers? What procedures should be used, and which dimensions, transforms, and partial or differential signals should be viewed by experts to evaluate specific impairments of real time audiovisual services? What objective and subjective methods can be used to evaluate audiovisual signals with time-varying quality (ITU, 2022)?

### **5.3.5 Criteria for Evaluating Multimedia Systems by Professionals**

Perry (2003) indicated some items as criteria for evaluating multimedia by professionals. They are as follow:

- ✓ Is the course easy to install, set up, or access on an Internet or intranet server using standard Internet or network protocols? Does it run properly?
- ✓ Does the program include a sufficient amount and quality of information?
- ✓ Does the program educate, inform, and provide insight to the viewer?

- ✓ Is the content technically and factually accurate for the subject, discipline, or industry to which it is related?
- ✓ Are scenarios, simulations, or exercises realistic to the actual job tasks or conditions?
- ✓ Does the program enhance the instruction/delivery of the subject matter?
- ✓ Do the direction, sound, editing, and photography work together and work consistently with the information to engage the viewer completely in the program?
- ✓ Does the course present students with an overview that describes the purpose of the course and who will benefit from taking the course? Does it provide tips on how to use the courseware successfully?
- ✓ Does the course address an overview, outline, and learning objectives for its various segments?
- ✓ Is the course designed in a way that ensures users will learn?
- ✓ Does the course present core competencies, performance standards, learning objectives, learning activities, and assessment activities to students in an easy-to-use, intuitive interface?
- ✓ Does the course present syllabus information such as grading/certification policy, expectations for participation, due dates for assessments, and protocol for interaction between instructor/facilitator and students and other students?
- ✓ Does the course provide for instructor/facilitator/mentor feedback to student (and student-to-student feedback)?
- ✓ Does the program capture the viewer's interest and spark discussion?
- ✓ Does the program engage the student through novelty, humor, gaming, testing/quizzing, discovery-adventure, and unique or surprise elements?
- ✓ Does the program effectively and appropriately use media such as video, animation, music, narration, sound effects, and special visual effects?
- ✓ Is the program designed for the intended audience?
- ✓ Does it avoid being condescending, trite, pedantic, or too "cute"?
- ✓ Are the reading and educational levels appropriate to the audience?
- ✓ Do course materials communicate directly and consistently with the student, using the second person?
- ✓ Is the program attractive and appealing to the eye and ear?
- ✓ Are there large variations in volume between sound elements?
- ✓ Are there large variations in quality among the various graphics, animations, or motion video elements?
- ✓ Does the user have ample opportunity to engage program elements through his or her own input?
- ✓ Does the program encourage just-in-time learning, question-answer, and problem solving?
- ✓ Does the course include and support learning activities that teach students, not just test them (discovery learning)?
- ✓ Does the course include a significant amount of practice activities for students?
- ✓ Does the course include interactive learning aids, such as self-assessment exercise and performance checklist tools?
- ✓ Can users determine their own path through the program?
- ✓ Does the course present clear, user-friendly instructions to the student regarding navigation in the multimedia learning environment?
- ✓ Is there appropriate use of icons and/or clear labels so users don't have to read excessively or take tutorials to determine program options?
- ✓ Is some type of evaluation used?



- ✓ Does the course include performance assessment tasks with a supporting scoring guide?
- ✓ Is mastery of each section's content advised before student proceeds to the next sections?
- ✓ Is demonstrated performance required?
- ✓ Does the student get a different assessment experience if the activities are repeated? (That is, are assessments programmed to randomize, or vary based on performance?)
- ✓ Are student performance data recorded, such as time to complete, question analysis, and final scores?
- ✓ Is the data forwarded to the course manager automatically?
- ✓ Are report printouts available?
- ✓ Does the course provide for innovative approaches to teaching and learning?

#### **4.4 SUMMARY**

This unit examined the evaluation of multimedia system, types of evaluation of multimedia system, reasons for evaluation of multimedia system, criteria for evaluation of multimedia system by users and criteria for evaluating multimedia system by professionals. Evaluation is testing whether a designed multimedia system fulfills the set goals and objectives, and suggests any improvements required to make it useful for its target audience. It is a process of determining the merit, worth, or value of multimedia system. The evaluation process is to appraise, analyze, assess, critique, examine, grade, inspect, judge, rate, rank, review, study and test in order to determine its quality, effectiveness, efficiencies among others.

#### **SELF-ASSESSMENT EXERCISES**

1. \_\_\_\_\_evaluation tends to elicit information that can be used to determine if a multimedia meets the stated goals and objectives or needed to be modified.
2. \_\_\_\_\_is testing whether a designed multimedia fulfills the set goals and objectives, and suggests any improvements required to make it useful for its target audience
3. \_\_\_\_\_evaluation is carried out as a constant process in the design and production of multimedia and this may even happen before the design and production process actually starts.

#### **5.5 GLOSSARY**

1. Evaluation is testing whether a designed multimedia fulfills the set goals and objectives, and suggests any improvements required to make it useful for its target audience.
2. Formative evaluation is carried out as a constant process in the design and production of multimedia and this may even happen before the design and production process actually starts.
3. Summative evaluation of multimedia refers to the evaluation that determines the worth of the multimedia resources at the end its design and production
4. Summative evaluation tends to elicit information that can be used to determine if a multimedia meets the stated goals and objectives or needs to be modified.

## **ASSIGNMENT FILE**

1. Define evaluation of multimedia system.
2. Discuss the various types of evaluation of multimedia system
3. What are the criteria for evaluating a multimedia system by users?

### **5.6 REFERENCES/FURTHER READING**

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### **5.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Summative
2. Evaluation
3. Formative

**Module 3: Skills and Maintenance of Multimedia Technologies in Library Centres Operations**

**Unit 1:** Competencies and Skills of Multimedia Librarian

**Unit 2:** Competencies and skills of multimedia users

**Unit 3:** Safety requirements for multimedia utilisation

**Unit 4:** Diagnosis and maintenance of multimedia technologies in library operations

**Unit 5:** Problems and Challenges associated with the application and use of multimedia technologies in library and information services in Nigeria

**Unit 1: Competencies and Skills of Multimedia Librarian**

**UNIT STRUCTURE**

**1.1 Introduction**

**1.2 Learning Outcome**

**1.3 Main Content**

**1.3.1 Multimedia Competencies and Skills**

**1.3.2 Various Multimedia Competencies and Skills required of Librarians in Libraries and Information Centres**

**1.3.3 Ways by Which Multimedia Librarians Can Improve Their Competencies and Skills**

**1.4 Summary**

**1.5 Glossary**

**1.6 References/Further Reading**

**1.7 Possible Answer to Self-Assessment Exercise(s) within the Content**

**1.1 INTRODUCTION**

This unit will examine the competencies and skills of multimedia librarians in libraries and information centre. Competencies is the quality or state of being skilled or knowledgeable in a particular profession or duty. It can also be referred to as the quality or state of having sufficient knowledge, judgment, skill, or strength for a particular duty or in a particular respect. Anyim (2019) stated that multimedia technology has become prevalent in the educational system and has been widely employed in teaching and learning across nations. The author stated further that multimedia has also gained wider access into the business world especially in the area of branding and marketing. It is pertinent to know that multimedia has permeated virtually, all areas of human endeavor. It has become an indispensable tool to reckon with. However, there is need for the required competencies and skills to be able to utilise this technology. Hence, the competencies and skills of multimedia librarians will be studied in this unit.

**1.2 Learning Outcomes**

By the end of this unit 1 of module 3, the students should be able to explain:

1. Multimedia competencies and skills
2. Various multimedia competencies and skills required of librarians in libraries and information centres

3. Ways by which multimedia librarians can improve their competence skills.

### **1.3 COMPETENCIES AND SKILLS OF MULTIMEDIA LIBRARIAN**

#### **1.3.1 Multimedia Competence Skills**

Multimedia has brought a lot of changes to traditional library services. The traditional library services option are no longer acceptable to a large majority of users. Hence, there is a newer form of services which are not so familiar to traditional librarians. Librarians now have to familiarise themselves with all relevant and popular multimedia formats. In this century, librarians should be able to collect, analyse, organize and deliver information from various formats and repackage them according to the need of the users. Users will not only use them effectively but they will also boost their interest in learning. Librarians may be better off, if they pay attention towards developing and enhancing their multimedia competencies and skills. Competence is the interplay of knowledge, understanding skills and attitudes required to do a job effectively from the point of view of both the performer and the observer (Gulati & Raina, 2000). On the other hand, skill is an accumulated knowledge which enables one to perform a job accurately and effectively. Skill can also be referred to as effective application of knowledge in such a way that tasks are executed effectively and efficiently (Nwangwu & Obi, 2014). Competencies and skills require specialized knowledge, technical know-how, or exceptional ability to perform certain tasks well. Multimedia skill is defined as the ability to effectively and efficiently design, develop, integrate, and implement multimedia technologies for effective instructional delivery. The unique competencies of the librarian include in-depth knowledge of print and electronic information resources that meet the strategic information needs of the individual or group being served (Anyim, 2019).

#### **1.3.2 Various Multimedia Skills required of Librarians in Libraries and Information Centres**

There are various multimedia competencies and skills required of a librarian in libraries and information centres are as follow:

**1. Textual Creation:** Textual creation skill is required for the creation, naming and saving a document; formatting document; inserting image; creating hyperlink; adding virtual appeal/cell shading; insert header or footer; creating page orientation; creating custom margin and text alignment in tables. Librarians need this skill to be able to serve the libraries better (Anyim, 2019).

**2. Audio and Video Creation skills:** This skill involves recording live audio/video; converting text into speech with the aid of “text to speech” tool expunging or removing unwanted parts of an audio/ video clip; exporting/importing audio files across audio editing platform; remixing or mixing different audio files; apply noise reduction effect to audio or sound files; fading in and out audio in a video; adding audio on Youtube; changing the background music in video (Anyim, 2019)

**3. Graphic/image Creation skills:** It is the creation of images formation pictures and animation; designing themed presentation; cropping images to maximise copy space; resizing and skew images to a particular dimension; designing visual assets for social media; matching colors within the design to enhance beauty; converting graphic image file formats

to other formats; merging objects together using the blend tool; pair contrasting fonts and add transparent icons (Anyim, 2019).

**4. Animation Creation skills:** It is a skill for developing a custom show in PowerPoint; converting PowerPoint presentation to video; designing instructional picture slide show in flash; exporting image/movie files for use in other platforms; creating a storyboard for animation video; writing a stellar video script; importing multimedia elements into adobe flash stage; organizing multimedia elements in layers and designing motion between animation (Anyim, 2019).

**5. Creativity:** Multimedia design requires both creativity and technical skills to integrate more than one media, in order to create and develop interesting interactive multimedia.

**6. Computer Competence:** Computer competence refers to the skills one has at his/her disposal while using computer-based technology. Multimedia librarians work almost entirely on the computer, using a variety of software programs for research and design purposes. Multimedia librarians are to familiarise themselves with graphic design, photo correction, and video editing, which are all done using a computer.

**7. Communication Skills:** Multimedia designs require strong communication amongst users and even other professionals. Multimedia librarians may need to correspond with their users to ensure that they are meeting all of their standards. Also, the multimedia librarians should be able to communicate with lectures, researcher, students, and other information resources users in an effective ways.

**8. Design Competence:** Just like creativity, having a strong design competence is vital for multimedia librarians. Design skill may come naturally or develop over time, but librarians frequently need to enhance their design competence skills by working on various projects using elements outside of their training or prior experience. Design skills can include manipulation of colors, fonts, composing background music, scripting a podcast among others.

**9. Editing Skills:** Editing skill is very important for multimedia librarians because it ensure that the originality of the work has not been compromised. For instance, for the informative media work, it's very important that information and sources are accurate to avoid potential legal issues or misinformation. Editing can be an important part of creative work too.

**10. Efficiency:** Multimedia librarians usually work on information resources for students, lecturers and the community who have certain expectations, including timeliness. Therefore, efficiency is important for multimedia librarians who are working on information resources to keep up with deadline and timeframe.

**11. Scriptwriting Skills:** Scriptwriting skill is required to write script for libraries and information centres' information resources. The skill involves writing the story, characters and setting of the multimedia piece.

**11. Team Building Skill:** is a skill that enables multimedia librarian to work with others as a cohesive unit.

**12. Video Creation Competence:** Video creation competence enables multimedia librarians to create the video for multimedia information resources.

**13. Subject Matter Competence:** This is a skill which enables a multimedia librarian to be an expert or authority in a particular subject area or topic.

**14. Information Design Competence:** This is a skill that enables a multimedia librarian to present information in an effective and efficient way.

**15. ICT Hardware Competence:** This involves the ability of librarians to operate basic computer tools like printers, scanners, photocopiers, smart-phones, tablets and projectors.

**16. Safe Internet Usage Competence Skill:** This is the ability of librarians to use in Internet, most especially, the search engines for research purposes or updating libraries and information centres' website and social media accounts.

**17. Typing Skill:** This is the ability to use a word processing program like Microsoft Word to create letters, agendas and minutes.

**18. Document Creation Skill:** This is the ability of librarians to use software like Microsoft Word, Microsoft Publisher or Adobe Creative) to produce professional documents. Similarly, the ability to use PowerPoint presentations, letters, leaflets or posters.

**19. Email and Calendar Management Skills:** This is the ability of librarians to use an email solution Microsoft Outlook, Yahoo Mail, Gmail as well as Institution Email to communicate with internal and external contacts, keep calendars up to date, and book meetings. In some cases, librarians might be required to create and manage users' accounts. Hence, librarians will need an in-depth knowledge of email systems, to create and manage user accounts.

**20. Technical Skills:** Technical competence skills involve the ability of multimedia librarians to handle various multimedia software effectively and efficiently. These software are as follow:

- Adobe.
- Adobe Creative Cloud.
- Adobe Illustrator.
- Adobe InDesign.
- Campaign management software.
- HTML.
- Java.
- Microsoft Access.
- Microsoft Excel.
- Microsoft Office.
- Photoshop.
- PowerPoint.
- WordPress.

**21. Soft Skills:** As a multimedia librarian, you will need to demonstrate the soft competence abilities in order to ensure that multimedia content development cycles remain on track.

These soft competence skills include:

- ✓ Ability to meet deadlines.
- ✓ Attention to detail.
- ✓ Critical thinking.
- ✓ Decision making.
- ✓ Handling criticism.
- ✓ Multitasking.
- ✓ Organizational skills.
- ✓ Prioritizing.
- ✓ Problem solving.
- ✓ Time management.
- ✓ Working independently.

**22. Website and Graphic Design Skills:** Multimedia librarians must developed website development and graphic design competence skills. These skills are good for effective service delivery. They are:

- ✓ Animation.
- ✓ Creating interactive charts, graphs, and maps.
- ✓ CSS.
- ✓ Incorporating video with text.
- ✓ Implementing tracking codes.
- ✓ Interactive media.
- ✓ Digital video cameras.
- ✓ Optimization.
- ✓ Photography.
- ✓ Usability testing.

**23. Web Analytics:** These are the skills required by multimedia librarians to analyse and handle multimedia contents on the web and on the various on search engines. Web analytic competencies include:

- Assessing campaign performance.
- Google Analytics.
- Interpreting numerical data.
- Identifying key performance indicators.
- Metrics.
- Setting benchmarks (Alison, 2021).

**24. Practical Skills:** This is the ability to create a multimedia product that includes animation, audio and video. Similarly, it is the ability to support learners in the evaluation process, including user testing, collecting and analysing feedback, and planning for change.

### **1.3.3 Ways by Which Multimedia Librarians Can Improve Their Skills**

As a multimedia librarians, if you have very little competence at using ICT, take steps to familiarise yourself with ICT tools. Also, you can invest in the equipment you will be expected to use in your job descriptions. You can do this by buying a basic laptop that will

enable you to quickly learn the essential ICT skills needed for your job descriptions. If you already have basic ICT competence skills but you want to improve your skills, take time to carefully study the job description and list the essential and desirable ICT skills required for your role. Once you have listed areas for improvement, you can do the followings:

- ✓ Use your local library. For instance, if you need to improve your competence in the use Microsoft software like Word, Excel, PowerPoint, Access and Outlook, there are many instructional guide books available in your local library that provide step-by-step advice on the software.
- ✓ If you have a friend or relative has good ICT competence skills in the area you need to improve in, ask them to help you. You can arrange one-to-one training sessions with them so as to improve your competence.
- ✓ You can find free ICT competence courses available on the internet/online. You can find online training such as videos, webinars and podcasts.
- ✓ Learning on the job and applying your newly acquired skills is one of the best ways to learn. In order to learn more on the job, you can apply for an internship or work experience placement at an established organization where you can learn new skills.
- ✓ Be practising your new acquired skills. For example, if you are learning how to send and receive emails, get in touch with a friend you haven't spoken to in a while and arrange to be email pen-pals. This will allow you to build up your confidence and become more familiar with the email software (Praino, 2021).
- ✓ Collaborate with other artists
- ✓ Collaborating with other multimedia artists is one way to brainstorm ideas, as teamwork often facilitates creativity. If you work as part of a marketing or design agency, consider reaching out to your colleagues to see if they're interested in working on a project together or if they would give an honest critique of your work and vice versa. This can help you identify elements of your work you can improve upon while also exposing you to other creative minds and processes.
- ✓ Stay informed in creative trends in library and information science' field. Stay informed regarding creative and media trends is a good way to improve your multimedia skills.

Find a person who can mentor you on your needed skills. A suitable mentor who can offer you guidance and support can improve your multimedia skills. **1.4 SUMMARY**

This unit examined the competencies and skills of multimedia librarians in libraries and information centres. The study examined various competence such as textual creation, audio and video creation, graphic/image creation, animation creation, creativity, computer, communication, design, editing, efficiency among others as well as ways by which multimedia librarians can improve their competence. The importance of multimedia skills for librarians in libraries and information centres cannot be overemphasised because multimedia librarians with skills stand a better chance to securing jobs in libraries and information centres, the media industry, movie or entertainment industries. Multimedia skills enable librarians to use multimedia technologies to enhance teaching as well as prepare instructional materials. It also equips librarians for everyday tasks necessary to run libraries and information centres efficiently and smoothly.

#### **SELF-ASSESSMENT EXERCISE**



1. \_\_\_\_\_ is the ability to effectively and efficiently design, develop, integrate, and implement multimedia technologies for effective instructional delivery.
2. \_\_\_\_\_ may be better off, if they pay attention towards developing and enhancing their multimedia competencies and skills.
3. \_\_\_\_\_ is the quality or state of being skilled or knowledgeable in a particular profession or duty.
4. \_\_\_\_\_ can also be referred to as effective application of knowledge in such a way that tasks are executed effectively and efficiently.

## **1.5 GLOSSARY**

1. Competence is the quality or state of being skilled or knowledgeable in a particular profession or duty.
2. Librarians may be better off, if they pay attention towards developing and enhancing their multimedia competencies and skills.
3. Skill can also be referred to as effective application of knowledge in such a way that tasks are executed effectively and efficiently.
4. Competencies and skills require specialized knowledge, technical know-how, or exceptional ability to perform certain tasks well.
5. Multimedia skill is the ability to effectively and efficiently design, develop, integrate, and implement multimedia technologies for effective instructional delivery.

## **ASSIGNMENT FILE**

1. Mention and discuss 15 multimedia competencies of librarians.
2. Discuss ways by which librarians can improve their multimedia skills.

## **1.6 REFERENCES/FURTHER READING**

- Alison Doyle, A. (2021). Important Digital Media Skills That Employers. Retrieved from <https://www.thebalancecareers.com/digital-media-skills-2062387> on June 28, 2022.
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## **1.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Multimedia skill
2. Librarians
3. Competence
4. Skill

**Unit 2: Competencies and skills of multimedia users**

## **UNIT STRUCTURE**

### **2.1 Introduction**

### **2.2 Objectives**

### **2.3 Competencies and skills of multimedia users**

#### **2.3.1 Various Competencies and Skills of Multimedia Users**

#### **2.3.2 Importance of Multimedia and Skills**

#### **2.3.3 Career Opportunities in Competencies Multimedia Industries**

#### **2.3.4 How to Improve Competencies and Skills by Multimedia Users**

### **2.4 Summary**

### **2.5 Glossary**

### **2.6 References/Further Reading**

### **2.7 Possible Answer to Self-Assessment Exercise(S) within the Content**

## **2.1 INTRODUCTION**

There is an increasing demand for multimedia design and productions in organisations and industries. Also, a growing number of employers are seeking workers/users with multimedia competence skills such as web design skills and social media skills. Multimedia skills refer to the basic understanding of what a computer is and how to work with it for effective instructional delivery (Nicholas, 2013). Competencies and skills of multimedia users are the abilities needed to use multimedia technologies in teaching, learning, researches and recreational activities. They are the knowledge, skills, motivations and beliefs which multimedia users need to be successful in their work. There are various competence and skills which users should possess to successful use multimedia technologies in every sphere of life. These competence skills will be examined. Likewise, the importance of multimedia skills would be examined.

## **2.2 LEARNING OUTCOMES**

By the end of this unit, the student should be able to explain the:

1. Various competence and skills of multimedia users;
2. Importance of multimedia competence and skills;
3. Career opportunities in multimedia industries; and
4. Ways to improve competence and skills of multimedia users.

## **2.3 COMPETENCIES AND SKILLS OF MULTIMEDIA USERS**

### **2.3.1 Various Competence and Skills of Multimedia Users**

There are various competence and skills which users should possess for the successful use of multimedia technologies in every sphere of life. These competence and skills are as follow:

**1. Operation Competencies:** Operational competencies are the skills and ability to operate multimedia technologies such as computers, mobile phones, projectors, video and audio players. Lohr, (2003) argues that lack of operational and confidence with multimedia technology influence users' motivation to use multimedia technologies for learning, teaching, research and recreational activities. Thus, users should operate multimedia technology tools confidently on their own.

**2. Technical Competencies:** Technical competence refer to skills related to using multimedia resources and services through network communication systems such as Internet,

social media, databases among others to enhance ones' activities. Such activities may include facilitating users' access to resources, producing one's own content, manipulating content produced by others, and employing the affordances of the multimedia to post resources as needed. Technical competence and skills involve the ability of multimedia users to handle various multimedia software effectively and efficiently. These software are as follow:

- Adobe Analytics.
- Adobe Creative Cloud.
- Adobe Illustrator.
- Adobe InDesign.
- Campaign management software.
- HTML.
- Java.
- Microsoft Access.
- Microsoft Excel.
- Microsoft Office.
- Photoshop.
- PowerPoint.
- WordPress.

**3. Creativity:** Multimedia design requires both creativity and technical skills to integrate more than one media. In order to create and develop an interesting interactive multimedia system to achieve their purpose users need the knowledge or understanding of hardware and software.

**4. Computer Competencies:** Computer competence refers to the skills one has at his/her disposal while using computer-based technology. Multimedia users work almost entirely on the computer, using a variety of software programs for research and design purposes. Multimedia users are to familiarise themselves with graphic design, photo correction, and video editing, which are all done using the computer.

**5. Communication Skills:** Multimedia requires strong communication amongst users and even other professionals. Multimedia users may need to correspond with other users to ensure that they are meeting all of their standards. Also, multimedia users should be able to communicate with lectures, researcher, students and other information resources users effectively. The communication skills include the ability to create a short YouTube video to capture the demonstration of a process or the ability to reach out through the Internet to a wide community of people with one's ideas, to send and receive information or messages and to share information appropriately, and to identify trends and ideas from elsewhere.

**6. Problem-Solving Skills:** A successful multimedia users has the initiative to solve intricate problems. Problem-solving skills refer to the ability of multimedia users to resolve problems that may arise as a result of using multimedia resources and services. Problem-solving skills are among the key skills that employers are looking for in any establishment. Problem-solving starts with identifying the problems then coming up with solutions, implementing the solution and evaluating their effectiveness.

**7. Information Competence:** Information competence represents skills for searching, selecting, and assessing information resources on multimedia. The ability to search, select

and assess information resources is desirable because of the increasing volume of information available in this technology.

**8. Strategic Skills:** This consists of skills or ability to use multimedia resources and service to achieve personal and professional goals. It is assumed that users are aware of the opportunities available in multimedia resources and services. Therefore, they need skills to set goals to be reached by means of this technology, and perform the necessary actions by selectively obtaining, combining, and multimedia resources and services.

**9. Simulation Competence:** This involves the ability of multimedia users to interpret and construct dynamic models of real world processes. Simulation is a technique for practice and learning which are applied various disciplines and trainings. The competence and skills are the ability to replace and amplify real experiences with guided ones, often “immersive” in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion. “Immersive” here implies that participants are absorbed in a task or setting as if it were the real world (Gaba, 2004).

**10. Appropriation Skills:** It is the ability of multimedia users to meaningfully sample and remix media content. Appropriation skills are the ability of multimedia users to construct knowledge from social and cultural sources, and to integrate them into pre-existing structural framework.

**11. Cognitive Skills:** This is the ability to interact meaningfully with tools that expand mental capacities. It is the ability of users to think, read, learn, remember, reason, and pay attention.

**12. Intelligence:** It is the ability of multimedia users to pool knowledge and compare multimedia resources and services with others toward a common goal

**13. Judgment:** This is the ability to evaluate the reliability and credibility of different multimedia resources and service.

**14. Navigation Skills:** This is the ability of multimedia users to follow the flow of multimedia resources and services, most especially, across multiple modalities.

**15. Networking Skills:** This is the ability of multimedia users to search, synthesize and disseminate multimedia information resources and services.

**16. Independently Learning Skills:** This is the ability of multimedia users to learn independently or to take responsibility for working out what they need to know, and where to find that knowledge.

### **2.3.2 Importance of Multimedia Competencies**

The importance of multimedia competence skills in this age of advanced communication technology cannot be overemphasized. There are many benefits of multimedia skills. Some of them include the following:

1. **Individual Benefit:** We are in the era of multimedia convergence, this requires multimedia users to be multi skilled. As a result of multimedia convergence, media house owners tend to employ employees with skills in multimedia, that is, people who can handle text, images, audio, video, and animation at the same time. This gives the job applicant in the media market, opportunities to get employed.
2. **Journalism:** Journalism is not limited to traditional media outlets. Journalists can make use of different new media to produce multimedia pieces for their news stories. Journalists engage global audiences and tell stories with technology. A multimedia journalist can combine text, images, sound, videos, and graphics to tell an interesting story. This makes today's journalists versatile unlike in former days when journalists had to concentrate on one area of mass media.
3. **Personalized Education:** Learning and teaching with the assistance of interactive multimedia benefit students who are able to process information easily and those who need more time to learn and digest study content on their own. Similarly, students can complete the instructional goal through self-learning in distances where teachers are not able to provide individual consultation (Tsai et al., 2008).
4. **Repetitive Learning and Immediate Feedback:** The multimedia platform enhances effective learning through immediate feedback. Effective learning may relate to teaching, attitude and methods of individual teachers. The multimedia learning platforms provide opportunity to learn and practice repetitively unlike the traditional learning teaching and learning methods.
5. **Entertainment and Fine Arts:** Multimedia are heavily used in the entertainment industry, especially to develop special effects in movies and animations such as VFX, 3D and animation. Multimedia games are a popular pastime and software programs available either as CD-ROMs or online. Some video games also use multimedia features. Multimedia applications that allow users to actively participate instead of just sitting by as a passive recipient of information are called Interactive Multimedia. In the Arts, there are multimedia artists, whose minds are able to blend techniques using different media that in some way incorporate interaction with the viewer.
6. **Diversified Teaching Methods:** The multimedia platform provides diversified teaching materials through text, music, pictures, and animation, which can assist students' cognitive development.
7. **Industry:** In the industrial sector, multimedia is used to present information to shareholders, superiors, and co-workers. Multimedia is also helpful for providing employee training, advertising, and selling products all over the world via virtually unlimited web-based technology (Sheng, Lee & Tsai, 2008).

### 2.3.3 Career Opportunities in Multimedia Industries

Multimedia design and production requires many skilled and talented people. There are career opportunities in multimedia industries that may assist users to settle down after school

if they can acquire the relevant competence and skills involved in multimedia. Some of the career opportunities are as follow:

1. **Interpreter/Translator:** Interpreters or translators need to have native-level proficiency in languages such as the language of the original text or speech, and the language of the finished product. A translator, who works with the written word, must also have expert-level knowledge of grammar and style in both languages.
2. **Film/Video Editor:** The explosion of online and mobile video content had led to a corresponding increase in demand for film and video editors, who take footage and transform it into a finished product. Editors must be adept at using film editing software programs and generally, have a degree related to film or broadcasting.
3. **Technical Writer:** Technical writers create everything from instruction manuals to articles to documentation, and tend to work in STEM- related industries. To do this job, you'll need a bachelor's degree and experience with a technical subject, as well as the ability to explain complex concepts to a variety of different audiences and hit deadlines.
4. **Video Producer:** If you spend any time online, you have probably noticed that video is taking over your favourite sites. Someone has to create those meme-inspiring video moments; and that person is Video Producer. As the internet video boom continues, we expect to see more of these jobs on the horizon.
5. **Public Relations Specialist:** If you have fantastic communication skills and are comfortable talking about the merits of your favorite brand or product, a career in public relation might be the perfect fit for you. Public Relation specialists typically work for advertising agencies, public relations firms, or large companies with in-house teams. They design and execute media strategies to keep their employer's products and services in the news in a good way.
6. **Blogger:** Companies often employ bloggers as part of their marketing strategy; engaging blog provides a friendly public face for the company, while potentially helping the organization's ranking on Google and other search engines. Writers who work primarily on blogs have to be to turn out attention grabbing copy that adheres to the organization's voice and style guidelines, while keeping social media and company's principles in mind.
7. **Sound Engineer:** Sound Engineers work in a variety of different environments, from recording studios to stadiums to theaters. Also, they often maintain recording equipment.
8. **Art Director:** Art directors design visual concepts for promotions and products. They may work in print, online, television, and other media. Depending on their industry, art directors may have previously worked as graphic designers, photographers, or illustrators. To succeed at this job, you must be able to communicate well and manage a team of artists, as well as have proficiency in relevant design software.
9. **Social Media Specialist:** If you have already spent most of your time on Twitter, Instagram, TikTok, and among others, the good news is that it does not have to be a wasted time if you are willing to embrace the strategic marketing side of social media. With a bachelor's degree and plenty of social media knowhow, you might be able to turn your

passion into career. Just be advised that this job requires tact and discretion (Ejimofofor, Igboamalu& Enwezor, 2016).

### **2.3.4 How to Improve Competence and Skills of Multimedia Users**

Multimedia users can improve their competence and skills through the following ways:

- ✓ Use your local library. For instance, if you need to improve your skills in the use Microsoft software like Word, Excel, PowerPoint, Access and Outlook, there are many instructional guide books available in your local library that provide step-by-step advice on the software.
- ✓ If you have a friend or relative has good ICT competence skills in the area you need to improve in, ask them to help you. You can arrange one-to-one training sessions with them so as to improve your competence skills.
- ✓ You can find free ICT courses available on the internet/online. You can find online training opportunities such as videos, webinars and podcasts.
- ✓ Learning on the job and applying your newly acquired skills is one of the best ways to learn. In order to learn more on the job, you can apply for an internship or work experience placement at an established organization where you can learn new skills.
- ✓ By practising your new acquired skills. For example, if you are learning how to send and receive emails, get in touch with a friend you have not spoken with in a while and arrange to be email pen-pals. This will allow you to build up your confidence and become more familiar with the email software (Praino, 2021).
- ✓ Collaborate with other artists: Collaborating with other multimedia artists is one way to brainstorm ideas, as teamwork often facilitates creativity. If you work as part of a marketing or design agency, consider reaching out to your colleagues to see if they are interested in working on a project together or if they would give an honest critique of your work and vice versa. This can help you identify elements of your work you can improve upon while also exposing you to other creative minds and processes.
- ✓ Stay informed on creative trends in libraries and information science' field. This is another way of improving your multimedia competence skills by staying inform regarding creative and media trends.
- ✓ Find a mentor who can mentor you on your needed competence skills. This is another way to improve your multimedia competence skills by finding a suitable mentor that can offer you guidance and support in order to enhance your skills.

## **2.4 SUMMARY**

This unit examined the competencies and skills of multimedia users. The study examined various competence skills required by users, importance of multimedia competence and skills, career opportunities in multimedia industries and ways multimedia users can improve competence and skills. The importance of multimedia competence cannot be overemphasised because people multimedia users with competence stand a better chance of securing jobs in libraries and information centres as well as the media industry, movie or entertainment industries. Multimedia skills enable people to use multimedia technologies to enhance their everyday tasks. Hence, multimedia competence skills by users are vital in this century.



## **SELF-ASSESSMENT EXERCISE**

1. \_\_\_\_\_ of multimedia users are the abilities needed by the users to use multimedia technologies in teaching, learning, researches and recreational activities.
2. \_\_\_\_\_ refer to the ability of multimedia users to resolve problems that may arise as a result of using multimedia resources and services.
3. \_\_\_\_\_ refers to the skills one has at his/her disposal while using computer-based technology.
4. \_\_\_\_\_ refer to skills related to using multimedia resources and services through network communication systems such as Internet, social media and databases among others, to enhance ones' activities.

## **2.5 GLOSSARY**

1. Competence and skills of multimedia users are the abilities needed by the users to use multimedia technologies in teaching, learning, researches and recreational activities.
2. Operational competency skills are the skills and ability to operate multimedia technologies
3. Technical competence and skills refer to skills related to using multimedia resources and services over network communication systems such as Internet, social media, databases.
4. Computer competence refers to the skills one has at his/her disposal while using computer-based technology
5. Problem-solving skills refer to the ability of multimedia users to resolve problems that may arise as a result of using multimedia resources and services.

## **2.7 TUTOR MARKED ASSIGNMENT**

1. Mention and discuss 10 competence and skills for multimedia users
2. Discuss how users can improve their multimedia competence and skills.

## **2.8 REFERENCES/FURTHER READING**

- Ejimofo, A.O. Igboamalu, D.E. & Enwezor, H.C.(2016). Education financing in Nigeria Problems and solutions. UNIZIK, Awka Ifevic Publishers.
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- Sheng, RD., Lee, G. He, & Tsai, C. W. (2008). Enhancing skills of application software via web-enabled problem-based learning and self-regulated learning: An exploratory study. *International Journal of Distance Education Technologies*, 6 (3), 69 — 84.

## **2.9 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Competence and skills
2. Problem-solving skills
3. Computer competence
4. Technical competence

### **Unit 3:        Safety Requirements for Multimedia Utilisation**

#### **Contents**

**3.1    Introduction**

**3.2    Learning Outcomes**

**3.3    Safety Requirements for Multimedia Utilisation**

- 3.3.1 Safety Requirement for Utilisation of Multimedia Tools**
- 3.3.2 Safety Requirement for Multimedia in Work Place**
- 3.3.3 Reasons for Safety when Using Multimedia tools**
- 3.3.4 How to avoid Health and Safety Issues**
- 3.4 Summary**
- 3.5 Glossary**
- 3.6 References/Further Reading**
- 3.9 Possible Answer to Self-Assessment Exercise(S) within the Content**

### **3.1 INTRODUCTION**

Millions of people around the globe at present use multimedia technologies or computers as their primary business tools. The number of hours people use computers has increased tremendously in the last decade. With this increase in the use of multimedia technology, problems have also increased. Some of the common problems associate with multimedia technology use are repetitive strain injury, computer eyestrain and computer vision syndrome. These conditions are far easier to prevent than to cure once contracted. Having a healthy lifestyle and work habits and working at ergonomically good workstation (Giri, 2010). There is need to put in place, safety requirements for multimedia utilisation. In this unit, safety requirements for multimedia utilisation tools, safety requirements for multimedia in work place, reason for safety when using multimedia and how to avoid health and safety issues would be examined.

### **3.2 LEARNING OUTCOMES**

By the end of this unit, the student should be able to explain the:

1. Safety requirement for multimedia utilisation tools
2. Safety requirement for multimedia in work place
3. Reasons for safety when using multimedia tools
4. How to avoid Health and safety issues

### **3.3 SAFETY REQUIREMENTS FOR MULTIMEDIA UTILISATION**

Safety refers to a state of being safe and the condition of being protected from harm or other danger. Safety can also be described as the control of recognized hazards in order to achieve an acceptable level of risk. Safety requirements are those requirements that are defined for the purpose of risk reduction. There are various risks associated with the utilisation of multimedia technologies. These risks include but not limited to musculoskeletal injury, eye strain and headaches. There are safety guidelines to assist multimedia users prevent injury. Hundreds of standards and regulations have been developed to improve safety in the workplace. In the United States, the Occupational Safety and Health Administration is the agency that sets workplace safety requirements for companies (Dandannavar & Goudar, 2010). There are safety requirements for multimedia tools and work place. These will be discussed hereafter.

#### **3.3.1 Safety Requirement for Multimedia Tools**

The following safety guidelines will enable you to protect your multimedia tool from potential damage and to ensure your personal safety. They are:

- Place the multimedia tools/equipment on a hard level surface. You should leave a 10.2 cm (4 in) minimum of clearance on all vented sides of the multimedia tools to permit the airflow required for proper ventilation. If you restrict airflow to your multimedia tools, it can damage the multimedia tools or cause a fire.
- Do not stack your multimedia tools or place equipment so close together that it is subject to re-circulated or preheated air.
- Ensure that nothing rests on your multimedia tool's cables and that the cables are not located where they can be stepped on or tripped over.
- Ensure that all cables are connected to the appropriate connectors. Some connectors have a similar appearance and may be easily confused, for instance, do not plug a telephone cable into the network connector.
- Do not place your device in a closed-in wall unit, or on a soft, fabric surface such as a bed, sofa, carpet, or a rug.
- Keep your multimedia tool away from radiators and heat sources.
- Keep your multimedia tool away from extremely hot or cold temperatures to ensure that it is used within the specified operating range.
- Do not push any objects into the air vents or openings of your multimedia tool. Doing so can cause fire or electric shock by shorting out interior components.
- Do not use your multimedia tool in a wet environment, for example, near a bath tub, sink, or swimming pool or in a wet basement.
- Do not use AC to power multimedia device during an electrical storm. Battery powered devices may be used if all cables have been disconnected.
- Do not spill food or liquids on your multimedia tool.
- Before you clean your multimedia tool, disconnect it from the electrical outlet. Clean your device with a soft cloth dampened with water. Do not use liquids or aerosol cleaners, which may contain flammable substances.
- Clean the laptop LCD screen or monitor display with a soft, clean cloth and water. Apply the water to the cloth, then stroke the cloth across the display in one direction, moving from the top of the display to the bottom. Remove moisture from the display quickly and keep the display dry. Long-term exposure to moisture can damage the display. Do not use a commercial window cleaner to clean your display (Dell Technologist (n.d)).

### **3.3.2 Safety Requirement for Multimedia at the Workplace**

The followings are safety requirement for multimedia at the workplace:

#### **1. Workstation Risk Assessment**

A risk assessment is a comprehensive look at your workstation to identify those things, situations, processes, and among others that may cause harm, particularly to people. After the

identification, you should analyse and evaluate how likely and severe the risk is. Also, workstation risk assessment is used to ensure that each individual worker has the correct multimedia tool to enable them to work comfortably in front of the computer. This is engrained in health and safety guidelines to help the workforce prevent injury.



**Figure 23: Workstation risk assessment**

## **2. The Computer Monitor**

The computer monitor is the screen that you look at whilst you are using the computer or laptop. Many postural and eyesight health problems can be as a result of not having an appropriate computer screen for your intended use. For example, if you are going to sit at your computer for a long period of time, you can get eye strain if your screen is not big enough, or the correct brightness. You can also cause a postural injury if the top of your computer screen is not at your eye level to prevent you from slouching.



**Figure 24: The computer monitor**

## **3. Computer Chairs**

Sitting anywhere for a long period of time can be uncomfortable. However, not sitting in a chair with the proper postural support for your size can cause significant injury or postural problems. When considering computer chairs as part of health and safety, other items such as a footstool can be incorporated to help you sit more comfortably in the chair.



Figure 25: Computer Chairs

#### 4. Workstation Set-up

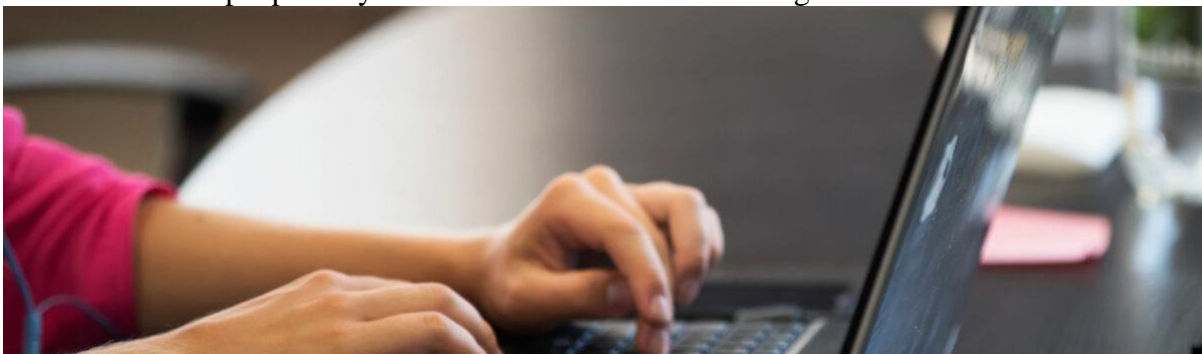
Having the items that you use frequently in close reach of your workstation can help you to avoid strain. However, having too many items around your workstation can also cause you to position yourself incorrectly as you try to avoid the clutter, which could cause repetitive strain injury.



Figure 26: Workstation Set-up

#### 5. Using laptops

Laptops are becoming increasingly popular due to their smaller size and convenience when travelling. They can also be used outside of the office, as more workplaces offer increasingly flexible working patterns. However, they also present the risk of poor posture; because of their smaller size people may often lean forward when working on them.





## Figure 27: Workstation Set-up

### 6. The Wider Environment

The environment that you are working in can have an impact on your physical health. For example, if the room where you are using your computer has extremely bright lights or high temperature it can instigate headaches and migraines.



Figure 27: The Wider Environment

### 7. Taking Breaks

Taking a break forms part of computer health and safety. Working in one position for a long period of time can be uncomfortable and you risk having poor posture. It also leads to fatigue which can add to aches, pains and headaches.



Figure 28: Taking Breaks (Source:<https://cpdonline.co.uk/knowledge-base/health-and-safety/computer-health-safety/>)

#### 3.3.3 Reasons for Safety when Using Multimedia tools

Safety should never be overlooked when using multimedia equipment as it can help to prevent health issues such as:

- ✓ **Repetitive strain injury (RSI):** RSI can occur when you complete the same movement repeatedly over a prolonged period of time. When using a computer, RSI is often associated with the fingers, wrists and arms. This is because you may not be sitting in the correct position for your hands and arms to reach the keyboard comfortably. Continued use of the keyboard and mouse whilst not in the correct posture can eventually cause the fingers, hands or arms to ache. To prevent this, you should take regular breaks away from the computer so that you can move into a different position. At least a five-minute break is recommended for every hour sat at the computer.

- ✓ **Posture related injury:** Other posture related injury in relation to working at a computer can affect your back, neck and shoulders. This can be as a result of a number of things such as:
  - Your display screen not being at the correct height.
  - Not having a chair suitable for you.
  - Missing a footstool.
  - Sitting for too long at the computer without a break.
  - Not sitting at a proper desk if you are using a laptop.
  - Leaning forward towards the screen causing you to hunch your neck, back and shoulders. To resolve this, you should take regular breaks and ensure that you are comfortable at your workstation.
- ✓ **Eye strain:** Eye strain can be caused by a number of factors when working at a computer, such as the brightness of the room and screen, unknowingly needing glasses or contact lenses, and not taking regular breaks away from the screen. To resolve this, you should ensure the lighting is appropriate for the room, your screen is not flickering and is the right brightness for you, take regular breaks, and ensure that you have regular eyesight check.

### 3.3.4 How to avoid Health and safety issues

There are many tips that can help to avoid health and safety issues in relation to utilisation of multimedia. Some of these tips are:

#### 1. Preventing back pain:

- Ensure that you can provide your employees with an adjustable chair with armrests so that it can be tailored to their body shape. Some people may need a footrest to ensure that their feet can be flat on the floor to maintain a good posture.
- Ensure that there is ample space under the desk for your employees to have their feet on the floor comfortably, as this will encourage proper posture.
- Take a break from the computer screen at least once an hour to change your position and have some time away from the screen.
- Do stretches in your chair to prevent keeping the arms and shoulders in the same position for too long.
- Keep your monitor at eye level height so that you do not tilt your neck forward to see your screen (if you are using a laptop, you can plug this into a larger monitor to prevent this).

#### 2. Preventing eye strain:

- Look away from the screen every 20 minutes using the 20-20-20 rule. This means that you should look away every 20 minutes at something 20 metres away for 20 seconds. This allows the eyes to re-focus and prevent strain.
- Ensure there is no glare or flickering on your computer monitor.
- Use glasses or contact lenses if you are required to.
- Use screen filters to dim the brightness if required.

#### 3. Preventing repetitive strain injury:

- Ensure that your mouse and keyboard are positioned within easy reach for your use. Your forearms should have contact with the desk when using the multimedia tool to help to avoid straining to reach certain keys.



- Soft touch-typing and mouse use should be encouraged to reduce the impact of the movement on your hand, wrist and fingers.
- Implement a clear desk policy to prevent clutter from causing people to overstretch for their multimedia tool when working.
- Take regular breaks from typing to readjust your posture (Source: <https://cpdonline.co.uk/knowledge-base/health-and-safety/computer-health-safety/>).

### 3.4 SUMMARY

This unit examined the safety requirements for multimedia utilisation, safety requirement for multimedia tools, safety requirement for multimedia at the workplace, reasons for safety when using multimedia tools and how to avoid Health and safety issues. Putting safety precautions in place in the use of multimedia equipment or other types of information technology tools can have a huge positive impact on one's life and work. Increase in workload may cause people to neglect their own safety which can place them at a higher risk of sustaining an injury. This may snowball into a crisis which could then impact one's health and the organisation's reputation. Following the correct safety requirements when using multimedia will not only protect you, but will also protect you, it will also protect organization. Hence, safety requirements for multimedia utilisation should be adhered to.

#### SELF-ASSESSMENT EXERCISE

1. \_\_\_\_\_ refers to a state of being \_\_\_\_\_ and the condition of being protected from harm or other danger.

### 3.5 GLOSSARY

2. Safety refers to a state of being safe and the condition of being protected from harm or other danger.
3. Safety requirements are defined for the purpose of educating risk.

#### ASSIGNMENT FILE

1. Define safety requirements for multimedia utilisation in libraries and information centres.
2. State the safety requirement for multimedia tools.
3. Discuss 5 safety requirements for multimedia utilisation at the workplace.
4. State the reasons for safety when using multimedia in libraries and information centres.
5. How can prevent health and safety issues in work place?

### 3.6 REFERENCES/FURTHER READING

- Dandannavar, V. S., Goudar S. S. (2010) Motor Performance In Upper Limbs Among Regular Computer Users. *Life Sciences and Medicine Research*, 14(4)
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### 3.9 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT

Safety, safe

## Unit4: Diagnosis and Maintenance of Multimedia Technologies in Library Operations

## **UNIT STRUCTURE**

### **4.1 Introduction**

### **4.2 Learning Outcomes**

### **4.3 Diagnosis and Maintenance of Multimedia Technologies in Library Operations**

#### **4.3.1 Preventive Maintenance**

#### **4.3.2 Predictive Maintenance**

#### **4.3.3 Corrective Maintenance**

#### **4.3.4 Breakdown Maintenance**

#### **4.3.5 Predictive Maintenance**

### **4.4 Summary**

### **4.5 Glossary**

### **4.6 References/Further Reading**

### **4.7 Possible Answer to Self-Assessment Exercise(S) within the Content**

## **4.1 INTRODUCTION**

In our previous class, we learnt the safety requirements of multimedia utilisation. In this class, we shall learn the diagnosis and maintenance of multimedia technologies in library operations.

## **4.2 Learning Outcomes**

By the end of this unit, the student would be able to explain:

1. Preventive Maintenance
2. Predictive Maintenance
3. Corrective Maintenance
4. Breakdown Maintenance
5. Predictive Maintenance

## **4.3 Diagnosis and Maintenance of Multimedia Technologies in Library Operations**

The diagnosis and maintenance of multimedia technologies in library and information centres' operations is the process of identifying a faulty condition, or injury from its signs and symptoms as well as the efforts taken to keep the condition and performance of multimedia technologies almost as when they were still new. The diagnosis and maintenance activities are fundamentally divided into two parts namely planned maintenance activities and unplanned maintenance activities. Planned maintenance is maintenance that is organized and carried out in accordance with the plans that have been determined previously for the multimedia technologies. While the unplanned maintenance of multimedia technologies refers to any maintenance task that occurs unexpectedly without any formal strategy in place to address a repair, replacement, or inspection before it was needed. Unplanned maintenance is usually the result of equipment failure that was not projected. There are different types of diagnosis and maintenance of multimedia technologies in library operations. They are:

#### **4.3.1 Preventive Maintenance**

Preventive maintenance of multimedia technologies in library operations is the keeping multimedia technologies from problems such as data loss, hardware and software failures. It is the regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems. Effective preventive maintenance may reduce part, material, and system faults and keeps hardware and software in good working condition. Preventive maintenance helps to extend the life span of multimedia technologies. Also, a regular preventive maintenance may reduce potential hardware and software problems, computer downtime, repair costs, and the number of equipment failures. It also improves data protection, equipment life, and stability and saves money.

#### **Factors Influencing Preventive Maintenance of Multimedia Technologies**

There are two factors that could influence preventive maintenance of multimedia technologies in library operations. They are the location of the multimedia technologies in the libraries and the use of the multimedia technologies. These are explained below:

- 1. Location of the Multimedia Technologies in the Libraries:** The location or environment such as dusty environments and construction sites may require more attention than any other location.
- 2. The Use of Multimedia Technologies:** Multimedia technologies that have intensive use such as a school networks, may require additional scanning and removal of malicious software and unwanted files to keep the multimedia in good condition.

#### **How to Carry out Preventive Maintenance of Multimedia Technologies in Libraries**

The following are some of the ways to carry out preventive maintenance of multimedia technologies in libraries:

- Clean/replace building air filters regularly to reduce the amount of dust in the air.
- Use a cloth or a duster to clean the outside of the computer case. If using a cleaning product, put a small amount onto a cleaning cloth and then wipe the outside of the case.
- Remove dust from the inside of a computer using a combination of compressed air, a low-air-flow vacuum cleaner, and a small lint-free cloth.
- Keep the can of compressed air upright to prevent the fluid from leaking onto computer components.
- Keep the compressed air can a safe distance from sensitive devices and components.
- Use the lint-free cloth to remove any dust left behind on the component.
- Do not obstruct vents or airflow to the internal components.
- Keep the room temperature between 45 and 90 degrees Fahrenheit (between 7 and 32 degrees Celsius).
- Keep the humidity level between 10% and 80%.
- Temperature and humidity recommendations vary by computer manufacturer. Research the recommended values for computers used in extreme conditions.
- Verify installed software current and follow the policies of the organization when installing security updates, operating system, and program updates.
- Review and install the appropriate security, software, and driver updates.
- Update the virus definition files and scan for viruses and spyware.
- Remove unwanted or unused programs.

- Scan hard drives for errors and defragment hard drives (Source: CISCO Networking Academic, 2020).

### **4.3.2 Predictive Maintenance**

Multimedia device/tool/equipment break down, often at the least convenient time. But today, any forward-looking user could make use of predictive maintenance to get ahead of multimedia equipment breakdowns, and better standardize productive operations needed by libraries. Predictive maintenance refers to a technique that uses condition-monitoring tools and techniques to monitor the performance of a structure or a piece of equipment such as multimedia technologies. The recorded information enables the users or professionals to predict the future failure point of the equipment being monitored and allow for the equipment to be fixed or replaced just before it fails. Predictive maintenance allows the maintenance frequency to be much lower and minimises the equipment down time and the costs associated with preventative maintenance. It allows for the operational lifetime of multimedia technologies being monitored to be maximised. It is pertinent to know how predictive maintenance work.

#### **How Does Predictive Maintenance Work?**

Predictive maintenance uses condition-monitoring equipment to evaluate equipment performance. The implemented sensors record a wide range of data, such as temperature, vibrations and conductivity, and among others, from the physical actions of a structure or piece of equipment. A key element of the process is the Internet of Things (IoT), which allows for different systems to work together to translate and analyse the recorded data to estimate when maintenance should be performed. Additionally, over time, new machine-learning technology can increase the accuracy of the predictive algorithms, leading to even better performance. With the affordability of bandwidth and storage, very large amounts of data can be recorded and analysed to give not only a full picture of equipment or tools in a single plant, but of an entire production network(Coleman, Satish & Ed, 2017).

#### **Difference between Predictive and Preventive Maintenance**

Preventative maintenance entails examining and performing maintenance on a multimedia technology at predetermined intervals, whether or not it is required. The maintenance intervals are typically based on either usage or time, that are determined from the average life cycle of the multimedia. Predictive maintenance allows a multimedia to be consistently monitored, which helps to determine a maintenance plan tailored for the multimedia. This approach contributes to maximising the life of a multimedia technology tool while simultaneously reducing maintenance costs.

#### **Advantages of Predictive Maintenance**

Predictive maintenance of multimedia technology tools in library operations offers many advantages, these advantages include the following:

- Minimising the time required for multimedia technologies' maintenance.
- Minimising lost production hours through minimised downtime.
- Minimising the cost of spare parts through maximising the life of existing multimedia technology tools.

**Benefits of predictive maintenance:**

- Less downtime: The operational downtime is less because it would have been predicted and prevented.
- Ability to catch problems earlier: The problems that might have occurred would have been diagnosed or analysed as forestalled.
- Savings on multimedia technology repairs: Recognising potential problems or fault beforehand may save the repair time
- Better worker safety: It a better safety for worker of user of the equipment.
- Better operational efficiency: It provides better operation efficiency because there may be no time for operational downtime.

**4.3.3 Corrective Maintenance**

Corrective maintenance refers to maintenance tasks which are undertaken after a system failure. Corrective maintenance helps to identify, isolate and repair a fault in order to restore equipment such as multimedia technology tools to operational condition so that it can perform its intended function in the library. Also, corrective maintenance is often associated to breakdowns, troubleshooting, disassembly, adjustment, repair, replacement and realignment. Often times, corrective maintenance is unavoidable, with maintenance teams having to respond to equipment breakdown or failure. However, it can be a bad idea to rely solely on corrective maintenance over other types of maintenance such as preventive maintenance. The corrective maintenance tasks may either be planned or unplanned and it occurs for three reasons, that is:

1. When condition monitoring the system highlights an issue
2. When a potential fault is detected through routine inspection
3. When a piece of equipment breaks down

**Types of Corrective Maintenance**

There are different types of corrective maintenance of multimedia technologies in library operations.

1. **Fail Repair** - Restoring a failed multimedia technologies tools to an operational state
2. **Overhaul** – Fully restoring multimedia technologies tools to its service state as outlined by maintenance standards
3. **Salvage** – Disposing of parts that cannot be repaired and replacing them with salvaged parts from unrepairable assets
4. **Servicing** – Final fixes following larger corrective actions
5. **Rebuild** – Disassembling parts and replacing worn components in line with original standards and specifications

**Advantages of Corrective Maintenance**

The advantages of corrective maintenance are as follow:

1. **It is less planning:** Corrective maintenance involves less planning compare to preventive maintenance.
2. **It is a simple process:** Corrective maintenance is a simple process that is need at the moment, therefore, the maintenance teams may focus on other areas until required.
3. **Lower short time costs:** This type of maintenance can be more cost-effective in the short term as work is only done when needed.
4. **It improves resource planning:** It allows labour and financial resources to be prioritized and optimised.

5. **It reduces downtime:** If a maintenance technician notices a worn component while performing routine maintenance, a corrective action can reduce the chance of later downtime due to failure
6. **It extends multimedia technology tool Lifetime:** Corrective maintenance can extend the lifetime of multimedia technology tool if parts are repaired or replaced before they impact other parts of a machine

#### **Disadvantages of Corrective Maintenance**

The following are some of the disadvantages of corrective maintenance:

1. **Higher long-term maintenance costs:** If the item is running until it breaks, it can lead to higher long-term maintenance costs as the condition of equipment deteriorates before problems are discovered. Also, it can lead to other components being affected and more parts requiring repair or replacement along with the associated labour costs
2. **Safety issues:** Pressure to reduce unexpected maintenance costs can also create safety issues as repair work may be rushed and not completed correctly.
3. **Unpredictable:** The unpredictable nature of corrective maintenance can lead to downtime in the operation of the library (Source: <https://www.twi-global.com/technical-knowledge/faqs/what-is-corrective-maintenance>)

#### **4.3.4 Breakdown Maintenance**

Breakdown maintenance refers to maintenance which is performed on a piece of equipment that has broken down, faulted, or otherwise cannot be operated. It can also be referred to as a continuous use of a part, machine, unit, or device until it breaks down and needs to be repaired or replaced. The goal of breakdown-maintenance is to fix something that has malfunctioned.

#### **Types of Breakdown Maintenance**

There two types of breakdown maintenance. These are:

##### **1. Planned maintenance**

Planned maintenance means that the library is prepared for a breakdown and even expects it to happen. The multimedia technology tool run until it breaks, which results to a failure. This kind of plan needs to be rigorously documented and controlled. Planned maintenance starts with a problem and identifies the materials, tools, and tasks necessary to work on the problem. The planning process involves inspections, part ordering, process descriptions, and work prioritization. These responsibilities fall on the maintenance planner's shoulders. The planned maintenance program for any equipment may include scheduling, but sometimes scheduling occurs separately via a maintenance scheduler.

##### **2. Unplanned maintenance**

Unplanned breakdown maintenance occurs when a piece of equipment fails or breaks unexpectedly which is also refers to as an unplanned downtime event. While some facilities may not utilize a planned maintenance plan, nearly every facility needs resources in place for unplanned maintenance. After all, every piece of equipment will break or fault at some point in its life.

### **4.3.5 Predictive Maintenance**

Preventive maintenance refers to act of performing regularly scheduled maintenance activities to help prevent unexpected failures in the future. It is fixing things before it breaks.

#### **Types of predictive maintenance**

There are various types of predictive maintenance. These are:

##### **Usage-based predictive maintenance**

This type of maintenance is usually trigger by the actual utilization of multimedia technology tools. This maintenance takes into account the average daily usage or exposure to environmental conditions of multimedia technology tool and uses it to forecast a due date for a future inspection or maintenance task.

##### **Calendar/time-based predictive maintenance**

Calendar/time-based preventive maintenance occurs at a scheduled time, based on a calendar interval. The maintenance action is triggered when the due date approaches and necessary work orders have been created.

##### **Predictive maintenance**

Predictive maintenance is designed to schedule corrective maintenance actions before a failure occurs. The team needs to first determine the condition of the equipment in order to estimate when maintenance should be performed. Then maintenance tasks are scheduled to prevent unexpected equipment failures.

##### **Predictive maintenance**

Prescriptive maintenance doesn't just show that failure is going to happen and when, but also why it's happening. This type of maintenance helps analyze and determine different options and potential outcomes, in order to mitigate any risk to operation

#### **Benefits of Predictive Maintenance**

- It helps to manage and reduce planned and unplanned maintenance, inventory and spare parts costs. Likewise, it offers a better insight into library operations and multimedia technology.
- It helps to boost productivity of workers
- It reduces unplanned downtime. The earlier identification of potential problems in multimedia technologies operation in the libraries reduces downtime and optimize production.

### **4.4 SUMMARY**

This unit examined the diagnosis and maintenance of multimedia technologies in library operations. Different types of maintenance such as preventive, corrective, predictive and breakdown maintenance of multimedia technology tools were examined. The diagnosis and maintenance of multimedia technologies is an inevitable activity in library and information centres operations. This is because it is the process of identifying a faulty condition, or injury from its signs and symptoms as well as the efforts taken to keep the condition and performance of multimedia technologies as when they were still new. Hence, the multimedia technologies used in libraries and information centre need to be maintained.

### **SELF-ASSESSMENT EXERCISE**

1. \_\_\_\_\_ refers to maintenance which is performed on a piece of equipment that has broken down, faulted, or otherwise cannot be operated.
2. \_\_\_\_\_ maintenance of multimedia technologies in library operations is refers to as keeping the multimedia technologies from experiencing serious problems, such as data loss, hardware and software failures.
3. \_\_\_\_\_ maintenance refers to maintenance tasks which are undertaken after the system's failure.
4. \_\_\_\_\_ maintenance refers to a technique that uses condition-monitoring tools and techniques to monitor the performance of a structure or a piece of equipment such as multimedia technologies.

### **4.5 GLOSSARY**

1. The diagnosis and maintenance of multimedia technologies in library and information centres' operations is the process of identifying a faulty condition, or injury from its signs and symptoms as well as the efforts taken to keep the condition and performance of multimedia technologies as when they were still new.
2. Preventive maintenance of multimedia technologies in library operations is refers to as keeping the multimedia technologies from experiencing serious problems, such as data loss, hardware and software failures.
3. Predictive maintenance refers to a technique that uses condition-monitoring tools and techniques to monitor the performance of a structure or a piece of equipment such as multimedia technologies tools during operation.
4. Corrective maintenance refers to maintenance tasks which are undertaken after the system's failure.
5. Breakdown maintenance is maintenance that is performed on a piece of equipment that has broken down, faulted, or otherwise cannot be operated.

### **ASSIGNMENT FILE**

1. What is maintenance?
2. Describe briefly, the various types of maintenance of multimedia technologies in library operations

### **4.6 REFERENCES/FURTHER READING**

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### **4.7 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Breakdown
2. Preventive



3. Corrective
4. Predictive

## **Unit 5: Problems and Challenges Associated with the Application and Use of Multimedia Technologies in Library and Information Services in Nigeria**

### **UNIT STRUCTURE**

#### **5.1 Introduction**

#### **5.2 Learning Outcomes**

#### **5.3 Challenges Associated with the Application and Use of Multimedia Technologies in Library and Information Services in Nigeria**

##### **5.3.1 Various Challenges Associated with the Application and Use of Multimedia Technologies in Libraries and Information Centres**

##### **5.3.2 Solution to the Challenges Associated with the Application and Use of Multimedia Technologies in Libraries and Information Centres**

#### **5.4 Summary**

#### **5.5 Glossary**

#### **5.6 References/Further Reading**

#### **5.7 Possible Answer to Self-Assessment Exercise(S) within the Content**

### **5.1 INTRODUCTION**

The application of multimedia in libraries and information centres has enhanced their services. Also, multimedia content is more attractive and appealing over traditional content. It engages more people. Multimedia improves the creativity and interactivity of presentations. It is cost effective and enhanced user interface makes it easy to use. Multimedia has created new jobs and new skills that can be learned and has allowed users to express their creativity. However, there are various problems and challenges associated with the application and use of multimedia technologies in libraries and information centres. In this unit, you will learn the various challenges and how they can be overcome.

### **5.2 LEARNING OUTCOMES**

By the end of this unit, the student would be able to explain various problems and challenges associated with application and use of multimedia technologies in libraries and information centres as well as proffer solution to the problems and challenges.

### **5.3 CHALLENGES ASSOCIATED WITH THE APPLICATION AND USE OF MULTIMEDIA TECHNOLOGIES IN LIBRARY AND INFORMATION SERVICES IN NIGERIA**

Application and use of multimedia technologies in libraries and information centres presents a host of problems and challenges. Some of them are as follow:

#### **5.3.1 Various Problems and Challenges Associated with the Application and Use of Multimedia Technologies in Libraries and Information Centres**

##### **1. Information overload**

Information overload is one of the biggest problem of the use of multimedia technologies in libraries and information centres. The more time a person spends on the internet, the more likely they are to feel overwhelmed by all the information available.

## **2. Misuse of Multimedia**

As useful as multimedia technologies in libraries and information centre are, they can be misuse. For instance, they can be distracting because many people like to watch videos while they are doing anything else, such as working or driving. This distracts them from what they should be focusing on. Multimedia also consumes a lot of time and resources that could be used for other activities.

## **3. Limited interaction**

It makes it hard for users to interact with their content. Users have limited ways in which they can engage with the text, images and sounds on a website. It does not give them the same experience that they would get from visiting a physical store.

## **4. Consumes a lot of time**

Multimedia technologies are useful to create many different types of content. Nevertheless, these technologies consume a lot of time. Users may spend hours on their phone or computer while they could have been doing other things like exercising or spending time with friends and family.

## **5. Expensive**

Multimedia technologies are expensive because of the resources required for its development. The production of multimedia is more expensive than others because it is made up of more than one medium. Also, multimedia technologies require an electronic device, which may be relatively expensive. Multimedia requires electricity to run, which adds to the cost of its use.

## **6. Resource intensive**

Multimedia is a resource intensive format. As a medium, it takes up space on your computer and can consume a lot of power. This adds to the overall cost for multimedia. It is also difficult to give multimedia content the proper attention that it deserves when it's being consumed across multiple devices and platforms

## **7 Requires huge investments**

Multimedia requires a significant investment. The users will need to hire artists, singers, videographers, and other individuals with unique talents

## **8. Accessibility**

Multimedia requires electricity to be operated, which may not be available in some rural areas or may not be consistently available due to shortages and blackouts.

## **9. Distracting**

Multimedia technologies could take away the focus from the lesson due to its attention.

## **10. Timing**

Creating multimedia requires more time.

## **11. Requires Mastery**

Multimedia requires consistent and long practice to master, which may take a lot of time and energy from the user.

## **12. Limited Support/Compatibility**

There is a wide variety of gadget models which arouses incompatibilities of media formats.

## **13. Fragile**

Multimedia technology tools must be used with care. This is because exposure to moisture or other elements could cause expensive and irreparable damage that would require the purchase of another one.

## **14. Lack of adequate skills**

Lack of adequate skills in the use of multimedia technologies is a problem and challenge in the application and use of multimedia in libraries and information centres. The incapability of librarians and other multimedia users in the application and use of multimedia technology

due to incompetence poses great concern for libraries and information centres. This was buttressed by Bent and Brink (2013) who stated that lack of multimedia technology skills by librarians, lecturers and students could affect the effective use.

**15. Lack maintenance culture**

Preventive maintenance is not place in most libraries and information centres wait until problems occur which may lead to downtime. For example, the maintenance staff should know when the multimedia tool is functioning properly and should update software in accordance to manufacturers standards. In Nigeria in general, there is a lack of maintenance culture which pervades all sectors. These very expensive multimedia gadgets are left to decay due to lack of long-term and systematic maintenance.

**16. Lack of functional ICT facilities**

Ensuring that both librarians and users acquire ICT skills requires that they have access to appropriate multimedia hardware and software. This often involves installing and maintaining many classroom workstations accommodating sets of workstations or networked personal computers. In libraries and information centres where the ICT facilities are available, they are inadequate.

**17. Multi-disciplinary knowledge demand**

The creation of multimedia content requires multi-disciplinary skills which is lacking.

**18. Copyright and ownership**

Many countries still lack the legal laws to protect multimedia products. From the onset, many multimedia products are produced with both original and non-original text, photos, music and other artists work. Some of the issues include: ownership of the intellectual property rights and a clear definition of public domain product, liability of the developer(s) by a faulty product and the developers' right to gain from the product or its future use and reproduction, variations of the original products and how it is treated and how to obtain third parties permission to use copyright works, how to prove ownership in case of unauthorized use and lack of international means of protection from piracy and illegal use or reproduction of multimedia products across international borders.

**19. Poor funding**

Over the years, many libraries and information centres, most especially in developing countries such as Nigeria have suffered poor funding. No much effort is made by the government to adequately fund the acquisition and use of multimedia technologies in libraries and information centres. There is need for proper funding. Edegbo(2011) stated that poor funding is the root of all the problems facing libraries and information centres in Nigeria.

**20. Poor power supply**

This is also another problem and challenge facing libraries and information centres in the application and use of multimedia technologies in Nigeria. This is a serious factor in Nigeria. Multimedia systems require steady power supply for to be operated. Inadequate power supply could hinder the use of multimedia technologies.

**21. Initial set up cost is high**

The initial set up cost is high. The procurement of required hardware and software is very expensive at the initial stage. Many libraries may find it difficult at the initial stage.

**22. Cross Platform**

There is the problem of multimedia bandwidth requirements and digital media file sizes in taking multimedia across platforms. For instance, in taking text across platforms, you may have some issues such as character translation, fonts, styles, and size of displayed text. For graphics you may have some issues as Mac displays larger than UNIX and PC. For video, you may have issues such as gamma. Also, you may have the issue of compression and compatible applications that recognize image types and colour representations. For Audio you may have issues such as file formats, and the search of suitable playing utilities.

## **22. Inadequate technological support for data storage and manipulation**

There is always a problem of storage space after some time and no provision is made to assist in solving this problem.

## **23. Inadequate and poor search patterns**

There are no standard search patterns for information retrieval in multimedia databases. Some search patterns are poorly designed for effective and efficient search and retrieval.

## **25. Threat to media channels**

Multimedia resources and services are open to attacks such as hacking of social media accounts, phishing, frauds, and among others. Hackers may easily hack into multimedia resources and services. Likewise, attackers may redirect users to malicious websites and the users may be duped.

## **26. Multimedia data stream is usually busty**

Just increasing the bandwidth will not solve the burstiness problem. For most multimedia applications, the receiver has a limited buffer. If no measure is taken to smooth the data stream, it may overflow or underflow the application buffer. When data arrives too fast, the buffer will overflow and some data packets will be lost, resulting in poor quality. When data arrives too slowly, the buffer will underflow and the application will be starved.

## **27. Human health and safety issues**

The use of multimedia technologies in libraries and information centres has human health and safety issues. The radiation from computer could have an effect on human eyes. Back and wrist pains are part of attendant problems and challenges of application and use of multimedia technologies in libraries and information centres.

### **5.3.2 Solution to the Problems and Challenges Associated with the Application and Use of Multimedia Technologies in Libraries and Information Centres**

#### **1. Provision of functional ICT facilities**

Government or the libraries and information centres should provide adequate ICT facilities for the application and use of multimedia technologies for effective service delivery. Functioning multimedia hardware and software should be made available for librarians and other users.

#### **2. Legal frame work should be provided for copyright and ownership**

Legal frame work should be provided for copyright and ownership. This will solve the problem and challenge of many multimedia products which are produced with both original and non-original text, photos, music and other artists work. The legal frame work should cover ownership of the intellectual property rights and a clear definition of public domain product, liability of the developer(s) by a faulty product and the developers' right to gain from the product or its future use and reproduction, variations of the original products and how it is treated and how to obtain third parties permission to use copyright works and remuneration, how to prove ownership in case of unauthorized use and lack of international means of protection from piracy and illegal use or reproduction of multimedia products across international borders.

#### **3. Government should provide adequate fund**

Government should provide adequate fund for the application and use of multimedia technologies in libraries and information centres. This will enable the libraries and information centres to procure all the necessary multimedia technologies required for effective service delivery.

#### **4. Provision of 24 hours power supply**

A 24 hours power supply should be provided for libraries and information centres. This is because multimedia systems require steady power supply for them to be operated. Inadequate power supply may hinder the use of multimedia technologies.

#### **5. Provision of fund for initial set up**

The initial set up cost is high; therefore, there should be provision for the initial set up of multimedia technologies in libraries and information centre. This involves provision of fund for the procurement of required hardware and software.

#### **6. Put a good maintenance culture in place**

A good maintenance culture should be put in place in the application and use of multimedia technologies in libraries and information centres. Libraries and information centres should not wait until problems occur. They should put preventive maintenance in place to decrease the down time.

#### **7. Regulations and Policies**

Libraries and information centres must strengthen regulations and policies on the use of multimedia technologies.

**8. Staff training:** Libraries and information centres should train the librarians and other users on the use of multimedia technologies. This would enhance their capability and competence in handling and using multimedia technologies.

#### **9. Users should create time for multimedia technologies**

Creating multimedia requires more time.

#### **10. Multimedia technologies require Mastery**

Multimedia requires consistent and long practice to master, therefore, there should be training and retraining of librarians and other users of multimedia technologies.

#### **11. Multimedia technology tools should be handled with care**

Multimedia technology tools must be handled with care. This is because of their fragile nature. They should not be exposed to moisture or other elements that could cause expensive and irreparable damage which would require another purchase of another one.

#### **12. Adequate skills**

Users should have adequate skills in the use of multimedia technologies in libraries and information centres. This will solve the problem of incapability of librarians and other multimedia users in the application and use of multimedia technology. This was buttressed by Bent and Brink (2013) who stated that adequate skills would have significant influence on the application and use of multimedia technologies in libraries and information centre.

#### **13. Safety precaution should be put in place**

The use of multimedia technologies in libraries and information centres has human health and safety issues. This is due to radiation from computer which could affect the human eyes. Back and wrist pains are part of attendant problems and challenges of application and use of multimedia technologies in libraries and information centres. Hence a safety precaution like screen protectors should be put in place. For the back and wrist pains, precaution that will alleviate the pains should be put in place.

#### **14. Provision of adequate security**

Multimedia resources and services are susceptible to attacks like hacking of accounts, phishing, frauds, and among others. Hence, there should be provision of adequate security to prevent the multimedia resources and services from Hackers and other malicious threat.

#### **15. Provision for backup and recovery**

Libraries and information centres should make provision for back-up and recovery of multimedia resources and services. Disaster, either natural like earthquake and tsunami or human made disaster like fire, flood and dam bursting could occur where multimedia technology tools are kept in libraries and information centre. Hence, library and information

centres should be proactive by preparing for back-up and recovery plan in case such disaster happens.

#### **5.4 SUMMARY**

This unit examined the challenges associated with application and use of multimedia technologies in libraries and information centres. The various problems and challenges such as poor power supply, inadequate ICT facility tools, inadequate funding, lack of adequate skills by librarians and users of multimedia technologies among others were examined. Similarly, this unit examined the possible solution to the problems associated with the use of multimedia technologies in libraries and information centres. Challenges in the application of multimedia technologies in libraries and information centres are inevitable. However, benefits always outweigh the problems and challenges. More so, most of the challenges can also turn to advantages if deliberate efforts are made to solve them. For instance, if lack of ICT facilities, inadequate funding and lack of required multimedia technologies skills can be solved, it will turn to advantages such as adequate ICT facilities, adequate funding and required skills in the application and use of multimedia technologies in the libraries and information centres. Therefore, libraries and information centres should not run away from the problems associated with the application and use of multimedia resources and services but should make deliberate efforts to surmount the problems.

#### **SELF-ASSESSMENT EXERCISE**

1. \_\_\_\_\_ culture is lacking in the application and use of multimedia technologies in libraries and information centres.
2. \_\_\_\_\_ and services are susceptible to attacks like hacking of accounts, phishing, frauds, and among others.
3. The use of \_\_\_\_\_ in libraries and information centres has human health and safety issues.

#### **5.5 GLOSARY**

1. Information overload is one of the biggest problems of application and use of multimedia technologies in libraries and information centres.
2. Multimedia technologies are expensive because of the resources required for its development.
3. Multimedia resources and services are susceptible to attacks like hacking of accounts, phishing, frauds among others.
4. Multimedia requires a significant investment.
5. Lack of adequate skills in the use of multimedia technologies is a problem and challenge in the application and use of multimedia in libraries and information centres.
6. Maintenance culture is lacking in the application and use of multimedia technologies in libraries and information centres.
7. Over the years, many libraries and information centres, most especially in developing countries such as Nigeria have suffered poor funding.
8. The use of multimedia technologies in libraries and information centres has human health and safety issues.
9. Government or the libraries and information centres should provide adequate ICT facilities for the application and use of multimedia technologies for effective service delivery.
10. Legal frame work should be provided for copyright and ownership.

11. A 24 hour power supply should be provided for libraries and information centres.

### **ASSIGNMENT FILE**

1. Discuss 10 problems and challenges facing the application and use of multimedia technologies in libraries and information centres in Nigeria.
2. What are the possible solution to the problems and challenges facing the application and use of multimedia technologies in libraries and information centres?

### **5.6 REFERENCES/FURTHER READING**

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### **5.9 POSSIBLE ANSWER TO SELF-ASSESSMENT EXERCISE(S) WITHIN THE CONTENT**

1. Maintenance
2. Multimedia resources
3. multimedia technologies