NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF EDUCATION

COURSE CODE: EDT 828

COURSE TITLE: MULTIMEDIA TECHNOLOGY IN TEACHING AND LEARNING

COURSE GUIDE

EDT 828
MULTIMEDIA TECHNOLOGY IN TEACHING AND LEARNING

Course Code	EDT 828
Course Title	Multimedia Technology in Teaching and Learning
Course Developer	Inegbedion, Juliet O. School of Education National Open University of Nigeria Lagos.
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Introduction

EDT 828: Multimedia Technology in Teaching and Learning. This course is a 2 unit course designed to train the learners on how to produce and utilize multimedia technology in teaching and learning, the concepts, skills and attitudes. The course is divided into three modules of five units each.

What you will learn in this course

You will be taught the Keywords and concepts in multimedia; Multimedia Production and Evaluation of Multimedia. A good coverage of this would enhance you the adequate competency required to practice multimedia learning and teaching.

Course Aims

There are fifteen study units in the course and each unit has its objectives. You should read the objectives of each unit and bear them in mind as you go through the unit. In addition to the objectives of each unit, the overall aims of this course include:

(i) To introduce you to the words and concepts in multimedia

(ii) To familiarize you with the peculiar characteristics multimedia

(iii) To expose you to the need for and the demands multimedia in teaching and learning

(iv) To prepare you for the production and implementation of multimedia in teaching and learning.

Course Objectives

The objectives of this course are:

i) To inculcate appropriate multimedia production skills on the learners

ii) Educate learners on how to implement multimedia software in teaching and learning.

iii) Educate the learners on how to integrate multimedia

iv) Enhance teaching and learning on multimedia techniques.

Working through This Course

You have to work through all the study units in the course. There are three modules and fifteen study units in all.

Course Materials

Major components of the course are:

1. Course Guide
2. Study Units
3. Textbooks
4. CDs
5. ATutor

6. Assignments File
6. Presentation Schedule

Study Units

The breakdown of the three modules and fifteen study units are as follows:

Module 1

Keywords & Concepts in Multimedia

Unit 1	Definition of Terms
Unit 2	Importance of Multimedia Systems
Unit 3	Teachers' Expectations in the Use of Multimedia
Unit 4	Students' Expectations in the use of Multimedia
Unit 5	Multimedia Technology in the Classroom

Module 2

Multimedia Production

Unit 1	Introduction to Multimedia Production
Unit 2	Tools Required in Multimedia Production
Unit 3	Production Procedure
Unit 4	Multimedia Delivery
Unit 5	Problems & Solutions in Multimedia.

Module 3

Evaluation of Multimedia

Unit 1	Meaning & Importance of Evaluation
Unit 2	Types of Evaluation
Unit 3	Issues in Evaluation
Unit 4	Developmental Testing or Alpha & Beta Testing
Unit 5	Evaluation as Continuous Process of Quality Improvement

References and Other Resources

Every unit contains a list of references and further reading. Try to get as many as possible of those textbooks and materials listed. The textbooks and materials are meant to deepen your knowledge of the course.

Assignment File

In this file, you will find all the details of the work you must submit to your tutor for marking. The marks you obtain from these assignments will count towards the final mark you obtain for this course. Further information on assignments will be found in the Assignment File itself and later in this *Course Guide* in the section on assessment.

Presentation Schedule

The Presentation Schedule included in your course materials gives you the important dates for the completion of tutor-marked assignments and attending tutorials. Remember, you are required to submit all your assignments by the due date. You should guard against falling behind in your work.

Assessment

Your assessment will be based on tutor-marked assignments (TMAs) and a final examination which you will write at the end of the course.

Tutor Marked Assignments (TMA)

Every unit contains at least one or two assignments. You are advised to work through all the assignments and submit them for assessment. Your tutor will assess the assignments and select four which will constitute the 30% of your final grade. The tutor-marked assignments may be presented to you in a separate file. Just know that for every unit there are some tutor-marked assignments for you. It is important you do them and submit for assessment.

Final Examination and Grading

At the end of the course, you will write a final examination which will constitute 70% of your final grade. In the examination which shall last for two hours, you will be requested to answer three questions out of at least five questions.

Course Marking Scheme

This table shows how the actual course marking is broken down.

Assessment	Marks
Assignments	Four assignments, best three marks of the four count at 30% of course marks
Final Examination	70% of overall course marks
Total	100% of course marks

How to Get the Most from This Course

In distance learning, the study units replace the university lecture. This is one of the great advantages of distance learning; you can read and work through specially designed study materials at your own pace, and at a time and place that suits you best. Think of it as reading the lecture instead of listening to the lecturer. In the same way a lecturer might give you some reading to do, the study units tell you when to read, and which are your text materials or set books. You are provided exercises to do at appropriate points, just as a lecturer might give you an in-class exercise. Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit, and how a particular unit is integrated with the other units and the course as a whole. Next to this is a set of learning objectives. These objectives let you know what you should be able to do by the time you have completed the unit. These learning objectives are meant to guide your study. The moment a unit is finished, you must go back and check whether you have achieved the objectives. If this is made a habit, then you will significantly improve your chances of passing the course. The main body of the unit guides you through the required reading from other sources. This will usually be either from your set books or from a Reading section. The following is a practical strategy for working through the course. If you run into any trouble, telephone your tutor. Remember that your tutor's job is to help you. When you need assistance, do not hesitate to call and ask your tutor to provide it.

In addition do the following:

- Read this Course Guide thoroughly, it is your first assignment.

- Organise a Study Schedule. Design a 'Course Overview' to guide you through the Course. Note the time you are expected to spend on each unit and how the assignments relate to the units. Important information, e.g. details of your tutorials, and the date of the first day of the Semester is available from the study centre. You need to gather all the information into one place, such as your diary or a wall

calendar. Whatever method you choose to use, you should decide on and write in your own dates and schedule of work for each unit.

- 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 for help.

- Turn to Unit 1, and read the introduction and the objectives for the unit.

- Assemble the study materials. You will need your set books and the unit you are studying at any point in time.

- Work through the unit. As you work through the unit, you will know what sources to consult for further information.

- Keep in touch with your study centre. Up-to-date course information will be continously available there.

- Well before the relevant due dates (about 4 weeks before due dates), 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.

- 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 pace your study so that you keep yourself on schedule.

- 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.

- 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).

Tutors and Tutorials

The dates, times and locations of these tutorials will be made available to you, together with the name, telephone number and the address of your tutor. Each assignment will be marked by your tutor. Pay close attention to the comments your tutor might make on your assignments as these will help in your progress. Make sure that assignments reach your tutor on or before the due date.

Your tutorials are important therefore try not to skip any. It is an opportunity to meet your tutor and your fellow students. It is also an opportunity to get the help of your tutor and discuss any difficulties encountered on your reading.

Summary

This course would train you on the concept of multimedia, production and utilization of it.

Wish you the best of luck as you read through this course

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MODULE 1

KEY WORDS AND CONCEPTS IN MULTIMEDIA

INTRODUCTION

Multimedia is new in teaching and learning process; which has been interpreted by different people in different ways to mean different things. Some people see multimedia as just computer based instruction. It goes beyond this. The name 'multi' in multimedia means 'many', this implies that many media are put together to form a single medium of instruction which is facilitated through the use of the computer. The computer acts as the compiler. Another word that could be used is 'integration' of different media to form a single medium. This would be discussed in detail later.

In this module you would be introduced to the general concepts of multimedia. This would be discussed under the following units:

Unit 1 Definition of Terms
Unit 2 Importance of Multimedia Systems
Unit 3 Teachers' Expectations in the use of Multimedia
Unit 4 Students' Expectations in the use of Multimedia
Unit 5 Multimedia Technology in the Classroom

UNIT 1 DEFINITION OF TERMS

CONTENT

1.0 Introduction
2.0 Objectives
3.0 Main Content
  3.1 Multimedia
  3.2 Technology
  3.3 Teaching
  3.4 Learning
  3.5 Multimedia Technology
4.0 Conclusion
5.0 Summary
6.0 Tutor Marked Assignment (TMA)
7.0 References

1.0 INTRODUCTION

In every discipline, there are specific terms. The meaning of a word in one discipline may mean a different thing in another discipline for example 'noise' in English Language means wave of sound while in communication is means any thing that would interrupt communication, it could be light, object etc. That is why it is very important to discuss specific terms that may be found important in a particular course or programme. In this unit you would be introduced to such terms as well as knowing the 'why' of multimedia in teaching and learning.

2.0 OBJEVTIVES

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

- Explain the major terms in multimedia
- Explain the usefulness of such terms in teaching and learning and the appropriateness of each media.

3.0 Main Content

There are different terminologies you might come across in the process of studying this course. It is therefore necessary that you are introduced to these terms and as well know the reason why multimedia is considered useful in teaching and learning. The various terminologies are discussed below.

3.1 Multimedia

It is important for you to know what is meant by the term 'multimedia'. For the purpose of this course, we are going to use the definitions given by CEMCA & COL 2003.

"Multimedia" is a term frequently heard and discussed among educational technologists today. Unless clearly defined, the term can alternately mean "a judicious mix of various mass media such as print, audio and video" or it may mean the development of computer-based hardware and software packages produced on a mass scale and yet allow individualized use of learning. In essence, multimedia merges multiple levels of learning into an educational tool that allows for diversity in curricula presentation.

"Multimedia is the exiting 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" (Fenrich, 1997).

"Multimedia is characterized by the presence of text, pictures, sound, animation and video; some or all of which are organized into some coherent program" (Phillips, 1997).

Today's multimedia is a carefully woven combination of text, graphic art, sound, animation, and video elements. When you allow an end user, i.e. the viewer of a multimedia project, to control 'what' and 'when' and 'how' of the elements that are delivered and presented, it becomes interactive multimedia.

As such multimedia can be defined as an integration of multiple media elements (audio, video, graphics, text, animation etc.) into one synergetic and symbiotic whole that results in more benefits for the end user than any one of the media element can provide individually.

"The term multimedia describes a number of diverse technologies that allow visual and audio media to be combined in new ways for the purpose of communicating. Applications include entertainment, education and advertising. Multimedia often refers to computer technologies. Nearly every PC built today is capable of multimedia because they include a CD-ROM or DVD drive, and a good sound and video card (often built into the motherboard). But the term multimedia also describes a number of dedicated media appliances, such as digital video recorders (DVRs), interactive television, MP3 players, advanced wireless devices and public video displays". (C:\Documents and Settings\user\Desktop\Multimedia Definition - Scala.htm)

SELF ASSESSMENT EXERCISES

Question: Having read through the definitions given above give your own definition(s) of Multimedia.

Answer: To know if you are on the right part, check for the key words in your definition(s) – audio, video, graphics, text, sound and animation.

You should also have a group discussion among your course mates to share your views.

3.2 Technology

We hear people talk about technology, and sometimes we say it too. Why is there so much stress on technology today both within and outside educational cycle? The popularity of it means there is something peculiar with the term. From the following discussions you may get to understand why the peculiarity.

*"The word **technology** originates in the Greek words technologia (τεχνολογία), techne (τέχνη, which means "craft"), and logia (λογία, which is "saying" or "ordering", in the sense of arranging)."*

*"**Technology** refers to all tools and procedures. It is the state of knowledge and development at any given time of our control of our surroundings, and includes all tools (utensils, devices, machinery, inventions, and structures), all methods (skills, processes, and techniques), and all applied materials (both raw and manufactured). In the most general sense, **technology** is Man's ability to control Nature. The term can be applied generally, or to specific areas, such as in "construction technology", "computer technology", and "medical technology". Technology generally advances over time, as people improve upon or replace the technologies that came before. The most advanced technology in any specific area is referred to as **state of the art** technology."* (Wikipedia 2006)

Some others see technology as "The technical means people use to improve their surroundings. It is also knowledge of using tools and machines to do tasks efficiently."

Technology is used for different things. The knowledge, tools, and systems used by people to make lives easier and better could be referred to as technology.

Through technology, a lot of things are better done, like better production, education, services etc.

3.3 Teaching

Teaching is a term that is technically heard everyday. The term is used both formally and informally. But here, it would be discussed formally.

Teachers are those who help learners to learn, usually in school. The teachers need to pass through some processes so as to be able to help the learner learn properly. These processes which the teacher undergoes are what is referred to as 'teaching' that is the process of direction or impartation. The different methods of teaching are often referred to 'pedagogy'. In deciding the method to use the teacher has to consider

the age, background knowledge, environment, their learning goals etc. before embarking on a particular teaching method.

There are two basic teaching styles – Learner and Teacher Centred method. The teacher need to know which of the method that should be used at a time. This would help the teacher prepare an adequate lesson.

3.4 Learning

Let's look at few definitions of learning.

"Learning is the process of acquiring knowledge or skill through study, experience or teaching. It is a process that depends on experience and leads to long-term changes in behavior potential. Behavior potential describes the possible behavior of an individual (not actual behavior) in a given situation in order to achieve a goal". en.wikipedia.org/wiki/Learning

All learners should have the benefit of sophisticated use of media. There are different ways learners learn. Some of such learning styles are:

- Active
- Reflective
- Sensing
- Intuitive
- Visual
- Verbal
- Sequential
- Global

These are the different learning types that are common in education. It is important for the teacher to study his/her learners to know the type of learning that is common with the learners. This would help the teacher to prepare an adequate lesson that would meet with the need of the learners and the behavioural objectives set.

You should note that each of the learning methods has its own peculiarity, which calls for specific instruction mode.

SELF ASSESSMENT EXERCISES

Question: Look through the text you have read and identify:

- The similarities between learning and teaching
- The differences between learning and teaching

Share your views in a group discussion.

3.5 Multimedia Technology

Having known what multimedia and technology are, it is also important we know what Multimedia Technology is. AT this level the two are now integrated to form a single term. Multimedia Technology (MMT) supports the use a computer connected to a Multimedia Projector (MMP), this allows large or small images to be projected onto a standard white board. Multimedia Technology is very useful in the classroom environment. This would be discussed later.

4.0 **CONCLUSION**

Knowing the terms used in multimedia for teaching and learning would help the teacher to understand the depth of what is required in the course of production and utilization of multimedia. It is therefore important for you as a teacher of technology to understand all the integrity involved in multimedia for teaching and learning.

5.0 **SUMMARY**

There are various terms that need to be understood in this course, such as multimedia, technology, multimedia technology, teaching and learning. These terms are linked when it comes to application. It is therefore worthwhile to understand in depth what each of them meant and at what level they need to integrate failing which it may lead to confused ideas to the learners, therefore the teacher must be very careful when applying these terms in the production and utilization of multimedia for teaching and learning. And that anything worth learning can be taught to learners in forms that are suitable to their individual requirements.

6.0 **TUTOR MARKED ASSIGNMENT (TMA)**

Define the following terms as used in teaching and learning:

- Multimedia
- Technology
- Teaching
- Learning
- Multimedia Technology

7.0 **REFERENCES/FURTHER READINGS**

Usha V. R, Director (2003). Commonwealth Educational Media Centre for Asia (CEMCA), New Delhi.

C:\Documents and Settings\user\Desktop\Technology - Wikipedia, the free encyclopedia.htm

UNIT 2 IMPORTANCE MULTIMEDIA SYSTEMS

CONTENT

1.0 INTRODUCTION

In the previous unit, you have been introduced to the basic terms you would find in this course. It may also interest you to know the importance of multimedia systems. In this unit the importance of multimedia in teaching and learning would be explained in details. Read carefully to note all the points.

2.0 OBJECTIVES

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

- Identify the importance of multimedia in teaching and learning
- Apply the importance in instruction

3.0 MAIN CONTENT

Now that you have known the meaning of multimedia, it would also be useful for you to know the importance of multimedia.

The pedagogical strength of multimedia is that it uses the natural information-processing abilities that we already possess as human. Our eyes and ears, in conjunction with out brain, form a formidable system for transforming meaningless sense data into information. The old saying that "a picture is worth a thousand words" often understates the case especially with regard to moving images, as our eyes are highly adapted by evolution to detecting and interpreting movement.

For example, a photograph of Ganges in Varanasi, apart from being aesthetically pleasing, can contain a wealth of information relating to the culture, religion, geography, geology, climate, history, and economics of the area. Similarly, a recording of a politician's speech can allow us to discern significant semantic features not obvious in a written transcript.

For the student, one advantage of multimedia courseware over the text-based variety is that the application looks better. If the courseware includes only a few images at least it gives relief from screens of text and stimulates the eye, even if the images have little pedagogical value. More often than not, the inclusion of non-textual media into courseware adds pedagogical value to the application. For example, a piece of courseware describing a dig at an archeological site would be more valuable to the student, if it included images of the site, such as enhanced aerial images showing features like old field boundaries, or diagrams illustrating where the digging and scanning took place. In this respect, using the text only, even in a creative way, has obvious limitations as compared to the use of both text and pictures.

Despite the importance of Multimedia, it is equally faced with some disadvantages as discussed below.

SELF ASSESSMENT EXERCISES

- Highlight the advantages of multimedia in the above text.
- Discuss your points in a group with your colleagues.

Practical Disadvantages of Multimedia

Multimedia requires high-end computer systems. Sound, images, animation, and especially video, constitute large amounts of data, which slow down, or may not even fit in a low-end computer. It involves the culture of transforming technology skills to a simplified manner to enhance learning. Unlike simple text files created in word processing multimedia packages require good quality computers. A major disadvantage of writing multimedia courseware is that it may not be accessible to a large section of its intended users if they do not have access to multimedia-capable machines. For this reason, courseware developers should think very carefully about the type of multimedia elements that need to be incorporated into applications and include only those tat have significant value.

Multimedia has other weaknesses too. It does not teach you all things. You must search and use sufficient time to understand its systems or networks. While proponents of this new technology are very enthusiastic about its potential, they often leave the financial and technical issues unattended. Development costs in multimedia are very high and the process of developing effective multimedia takes time. Time spent on developing the multimedia package requires money so that the true cost of an interactive programme mounts with each delay.

SELF ASSESSMENT EXERCISES

Question:

- The similarities between learning and teaching
- The differences between learning and teaching

Share your views in a group discussion.

Further, if the prerequisites for using multimedia include access to computers with related software, the user must possess a minimum level of computer literacy in order to exploit the capabilities of this medium for learning. And finally, training of the educator who is unfamiliar with the production and design of multimedia courseware or packages can be equally complicating.

The critical question, then, is: How do we overcome some of the identified barriers and begin the process of multimedia implantation alongside the instructor, textbook, and blackboard? It is the barriers rather than the technologies which we must address before multimedia, or for that matter, any media technology becomes as accepted as the printed text or guidebook.

SELF ASSESSMENT EXERCISES

- Highlight the disadvantages of multimedia in the above text.
- Discuss your points in a group with your colleagues.

4.0 CONCLUSION

In conclusion, the teachers should not always consider the advantages without considering the disadvantages. This is important because the awareness of the disadvantages would enable the teacher to know the exact areas that need to be put under control during production and utilization of multimedia in teaching and learning.

5.0 SUMMARY

The usefulness of the composition of multimedia has been found to be very useful. It gives opportunity to learners to have access to all varieties of teaching styles that appeal to learning. See 3.4 in Unit 1 Module 1. With this the learners are able to learn at their own pace and at their own understanding. It also makes teaching easier for the instructor. It gives opportunities to the teachers to inculcate ideas unto the learners with minimal difficulties.

Despite its usefulness there are demerits. The production of multimedia is quite involving, financially and technically. Some times implementation becomes difficult especially when large crowd is involved, this may be as a result of getting the necessary facilities to facilitate the desired action.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

- State the advantages of multimedia in teaching and learning.
- State the disadvantages of multimedia in teaching and learning.

7.0 REFERENCES/FURTHER READINGS

Usha V. R, Director (2003). Commonwealth Educational Media Centre for Asia (CEMCA), New Delhi.

UNIT 3 TEACHERS' EXPECTATIONS IN THE USE OF MULTIMEDIA

CONTENT

1.0 INTRODUCTION

It is good you know what is expected of teachers in using multimedia in teaching and learning. This would help to clear the uncertainty that is held unto by some people. The content would explain the role the teacher has to play in multimedia production and utilization.

2.0 OBJECTIVES

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

- Identify the role of the teacher in multimedia production and utilization.
- Explain vividly expectations of the teacher in production and utilization of multimedia in teaching and learning.

3.0 MAIN CONTENT

Some people feel that the use of multimedia in teaching may render the teacher jobless. This concept is contrary to the true concept of multimedia in teaching. Multimedia has a lot of benefit to the teacher. It enhances the job of the teacher. At the end of the following discussion, you will know more about the relationship between multimedia and the teacher; and then know if multimedia should be encouraged in teaching or not.

- **Allows Creativity.** One important benefit of multimedia to the teacher is that it gives opportunity to the teacher to become creative. Every good teacher would always look for the best way to impart knowledge on the learner. In the process of doing this, he/she has to

look for the best method the lesson can be achieved which may then call for integration of different media.

- **Saves Time**. Since the learners would be able to have access to the lesson without the physical presence of the teacher, it then means the teacher would spend the time he/she would have used for face-to-face teaching to do more research to enhance the present knowledge. This invariably gives more time to the teacher for more challenging topics.

- **Learners Contact Time is Increased**. Learners have more time to spend on discussion because they have the opportunity of learning at their own pace and time. They are not subdued to the compulsory attention needed at the face-to-face method of teaching and learning, because they are not subdued they therefore learn with a more relax mind and this gives opportunity to the teacher to introduce to the learners everything he/she wishes to teach without being time constrained which normally leads to course work not completed at the end of a term or session.

- **Ineffective Learning Activities Are Replaced**. Since the student nor the teacher does not have opportunity of given irrelevance in between lesson like you may find in face-to-face teaching, it then becomes imperative for the teacher to direct his/her teaching effectively and qualitatively with a minimal irrelevant activities if any.

In addition to the above, teachers do not need to be programmers before they can design a multimedia package. There are different types of elements which have been prepared for this purpose like 'Micromedia Flash'. All that is required of the teacher is to learn how to use the tools to accomplish his/her teaching.

Teachers should know when and how media should be selected and the appropriate time for integration if need be.

Teachers should know how to use multimedia to achieve their behavioral objective be it commercially produced or self made software.

SELF ASSESSMENT EXERCISES

Question: From the text, list the expectations of teachers in multimedia.

Answer: Share your answers in a group discussion.

4.0 CONCLUSION

The role of the teacher in the use of multimedia in teaching and learning is very vital and broad in scope. They are the major determinant of the success of implementation. Some times they could be skipped at the production level by giving their functions to those who are not in the field. This happens in most commercial productions which usually hamper the final product. But one thing is spectacular, whether it is commercially produced or not, they serve as the final implementers. They are to decide what should be used and what should be presented before the learners being it learner or teacher centred.

5.0 SUMMARY

The use of multimedia is very important to teachers in different ways which allows creativity, saves time, learners contact time is increased and ineffective learning activities are replaced. These make the use of multimedia by teachers more appreciable.

6.0 TUTOR MARKED ASSIGNMENT

Critically examine the importance of multimedia to the teacher in
teaching and learning.

7.0 REFERENCES/FURTHER READING

Usha V. R, Director (2003). Commonwealth Educational Media Centre for Asia (CEMCA), New Delhi.

UNIT 4 STUDENTS' EXPECTATION IN THE USE OF MULTIMEDIA

CONTENT

1.0 INTRODUCTION

Just as there are teachers' expectation in the use of multimedia in teaching and learning, so also there are students' expectations. This unit would expose you to such expectations.

2.0 OBJECTIVES

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

- Analyse the expectations of students in the use of multimedia in teaching and learning.

3.0 MAIN CONTENT

Before using multimedia in learning, one may want to know its usefulness. Question like 'why' and 'how' may arise. You want to know why multimedia should be used in learning. Does it have advantage over the traditional method? And if the conviction is made of why it should be used; then how would it be used? Answers to these questions are best got from learners' response; which is derived from the benefits gained by the learners.

Benefits to Learners

- The use of multimedia gives opportunity to learners to learn at their own pace. This means that learners are able to learn according to their learning abilities, in terms of time and rate of assimilation.

  Different learners have different best time for learning, in the same way different levels of assimilation, where we talk about fast and slow learners. In the previous discussion we talk about learning styles

and it is known that in a group of learners they would not all have same learning style. This calls for differentiation, which is a problem that is difficult to solve with the use of face-to-face method. With the use of multimedia, these differences are taken care of.

- With the use of multimedia in learning, learners are delivered from the hands of impatient teachers as well as vacuum created where there is frequent exit of teachers.

  Once the software is well packaged, the student may not need the physical presence of the teacher to understand what is to be taught.

- Learners have the opportunity of pursuing learning actively and receiving the desired feedback.

SELF ASSESSMENT EXERCISES

Question: From the text, list the expectations of learners in multimedia.

Answer: Share your answers in a group discussion.

4.0 CONCLUSION

The learners are usually the major focus in the production process of multimedia. They are the determinants of what should be produced this make them to have full benefit of the software. This opportunity allows learners to enjoy full freedom of study without studying under forceful environment and time.

5.0 SUMMARY

The use of multimedia is quite beneficial to learners. They are able to learn at their own pace, takes care of learners differences, learn as desired, and pursue learning activities. These benefits help to enhance academic performance of learners.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

Examine the role of learners in multimedia for teaching and learning.

7.0 **REFERENCES/FURTHER READINGS**

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UNIT 5 MULTIMEDIA TECHNOLOGY IN THE CLASSROOM

CONTENT

1.0 INTRODUCTION

Haven known the teachers and learners expectations of multimedia; it is important to discuss the utilization of it in the class room. With this you will be able to expatiate on why the need of multimedia in the classroom.

2.0 OBJECTIVES

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

- Identify a multimedia class room
- Explain in details, the importance of multimedia classroom

3.0 MAIN CONTENT

Why is Multimedia Technology used in the classroom?

When a computer is connected to a multimedia projector, it:

- gives opportunity for whole class delivery of information
- allows equality access of information
- enables the use of multimedia files to enhance understanding of ideas and concepts such as text, pictures, animations, graphs, sound and video files.
- supports a high level of interactive lesson with supportive lesson materials.
- enhance the delivery of differentiated learning opportunities through the extended activities.

In addition to knowing why Multimedia Technology is used in the classroom; it is also important that you know **How Multimedia Technology can be used in the Classroom**.

There are different ways Multimedia Technology can be used in the classroom; it all depends on the learning intention or behavioural objectives of the lesson. It is the class teacher that need to decide how best to support the lesson. Supportive media are available in the form of text, 'files', held on CDs, the Internet and floppy disk. The use of any of these depends on the class requirement. Whereby the teacher is using commercially produced software, he/she may choose to use the learners own work to support the learning intention.

In order to allow the class teacher to deliver an interactive lesson, the chosen media need to be in a format that will allow it to be adapted or customized by the class teacher, that is to say that the prepared lesson material runs in a parallel with the media being displayed. The following shows the various ways in which files could be selected:

- Text files – this could be in form of explanations, descriptions, opinions, reports, instructional, fictional etc. They could also be used to support other lessons in the classroom.

- Sound files – these are pre-recorded sound snippets; which could be in the form of speeches, songs, teaching especially in languages etc.

- Animation files – these types of files are very good for illustrations. They could be in the form of moving pictures with text and sometimes with sound.

- Pictures/Maps/Charts and Video files – these could be used purely for illustrative purpose or to support the daily learning objectives.

- File Integration – sometimes files could be integrated to enhanced teaching and learning. This means two or more files could be used at the same time.

SELF ASSESSMENT EXERCISES

Question: List the importance of Multimedia.

Answer: Share your answers in a group discussion.

4.0 CONCLUSION

In using these files, the teacher needs to have a very good grasp of each as well as the course content. This would enhance appropriate integration of both the topic and the media to be used. Also the teacher should not loose sight of the learners' needs and expectations.

5.0 SUMMARY

There are different ways of using multimedia technology in the classroom. It could be through the integration of two or more of text files, sound files, animation files pictures/maps/charts and video files. One important thing is that teacher must know when and how to use each of this. A poor usage could lead to distorted or haphazard instruction.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

Explain the procedure you would take in setting a multimedia classroom.

7.0 REFERENCES/FURTHER READINGS

Dorin, H., Demmin, P. E., Gabel, D. (1990). Chemistry: The study of matter. (3rd ed.). Englewood Cliffs, NJ: Prentice Hall, Inc.

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MODULE 2

MULTIMEDIA PRODUCTION

INTRODUCTION

This module would teach you the procedure required in the production of multimedia in teaching and learning. It is important that you study each unit carefully so as to attain the desired knowledge. Before you go on to the production process, it is important you reflect your mind to the definitions once more –

"Multimedia is the exciting combination of computer hardware and software that allow you to integrate video, animation, audio, graphics, and test resources to develop effective presentations on an affordable desktop computer" (Frenrich, 1997).

It enable the learner to participate skillfully in the production process, and generating a dependable product of acceptability and quality.

"Multimedia is characterized by the presence of text, pictures, sound, animation and video; some or all of which are organized into some coherent program" (Phillips, 1997)

The module is grouped into five units as follows:

Unit 1 Introduction to Multimedia Production
Unit 2 Tools Required in Multimedia Production
Unit 3 Production Procedure
Unit 4 Multimedia Delivery
Unit 5 Problems and Solutions in Multimedia

UNIT 1 INTRODUCTION TO MULTIMEDIA PRODUCTION

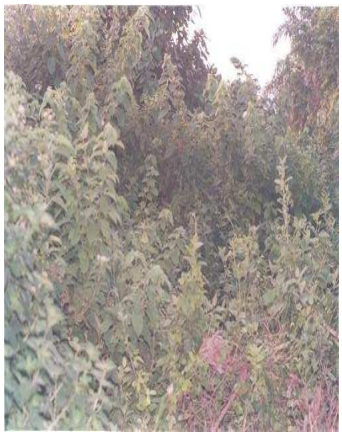
CONTENT

3.1.4 Resources
3.1.5 Cost
3.1.6 Theories and Models

3.2 The Script

4.0 Conclusion
5.0 Summary
6.0 Tutor Marked Assignment (TMA)
7.0 References/Further Readings

1.0 INTRODUCTION



Fallow Land

A man clearing the bush for planting

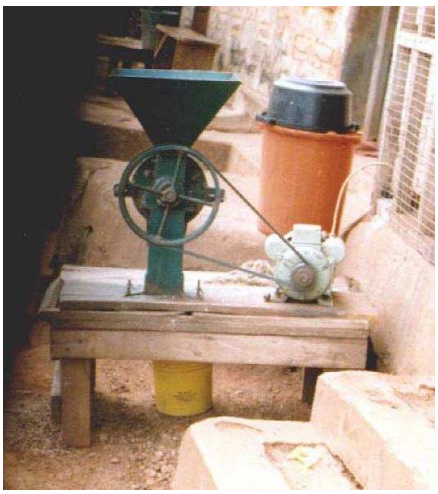
Preparing ridges

cassava farm

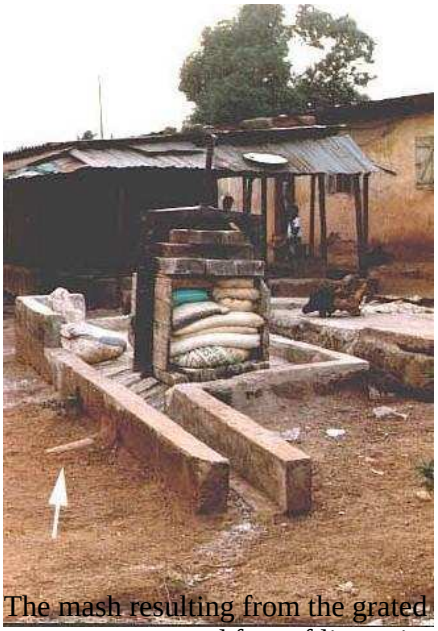
for cassava

Cassava roots before (**A**) and after peeling (**B**)

A heap of dried peels from the cassava root discarded in the bush



Peeled roots are grated in mechanical arrangements



The mash resulting from the grated roots are squeezed free of liquor in a press. To eliminate the nuisance the liquor is led by a pipe (arrow) into a pit

The final Product 'Garri' sold in the market

What can you observe from the pictures above? If you look closely you may observe that a process is represented, which is that of the production of garri. 'Garri' is one of the stable foods in Nigeria, but before the final product is brought to the market it needs to pass through a process. Before embarking on a process, the final consumers are considered because they stand to accept or reject the product. Therefore, they stand as the major focus of the producers. This brings about competition among the producers considering consumers' taste which may be in terms of the colour, taste, texture, and neatness in garri production.

Each producer of garri would therefore consider this criterion and then select the best resources and mechanism that would help to achieve the consumers demand.

Brainstorming: Brainstorm on any process of production around you. Take cognizance of the stages attained before the final product is realised.

Were you able to come up with a process? Good, you did try. Now write down all that were involved in the process before the attainment of the final product. Now that you have been able to do this, have you be involved in any process of production? If yes, what was your role.

In every production there is a process that must be attained. This brings us to the Production Process in Multimedia. Remember in the garri

production, the producers were conscious of the final consumers, so it is in the production of multimedia.

Going by the early history of instructional design, Aristotle, Socrates and Plato were the first scholars known to have contributed in cognitive basis of learning and memory. In 13th century Thomas Aquinas, a great philosopher has his own contribution to design. He sees the perception of teaching in terms of free will. 400 years later, John Locke emphasized that knowledge could come from experience, in line with Aristotle's notion. In 20th century, anther philosopher – John Dewey present his tenets – that learning occurs best when married with doing rather than rote regurgitation of facts.

This short history makes us to know that design and production of instructional materials is not a new idea but an idea that has been on for several years.

2.0 OBJECTIVES

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

- Identify multimedia content
- Write a simple multimedia script

3.0 MAIN CONTENT

3.1 The Multimedia Content

To produce a good multimedia for teaching and learning, there are certain things that must be put into consideration failing which a good result might not be attained. These include the lesson topic, behavioural objectives, audience, resources, theories and models.

3.1.1. The Lesson Topic

The first thing that needs to be considered in the production of multimedia for teaching and learning is the topic. What do you want to teach? What knowledge do you want to pass on to the learners? How would you pass on the knowledge? These are questions that must be answered before embarking on production process. The topic may have been a structured topic i.e. selected from the school scheme of work for the term or semester. In this case you are not to decide the topic. However, there are few instances where you have to decide the topic. In this instance, you need to consider the need of the learner and the environment where he/she lives.

The topic also includes the depth of what the teacher wants to teach i.e. the desired knowledge to be learnt in the topic. The topic acts as a guide for the producer.

3.1.2 Behavioural Objectives

What do you want the learners to achieve at the end of the lesson? In this unit there are stated behavioural objectives. See stated objectives above in 2.0. What behaviour do you expect from the learners after they have been exposed to the new knowledge? Behavioural objectives state learning objectives in "specified, quantifiable, terminal behaviours" (Saettler 1990). Successful learning is always demonstrable by programme of some observable indicator behaviour which may begin as low-level cognitive learning such as knowledge, re-call of information, ideas and concepts – leading to intermediate and High level learning.

For example: At the end of this unit the student will be able to name correctly 90% of the basic theories of learning.

- A – Audience – the student
- B – Behaviour – name correctly
- C – Condition – at the end of the unit
- D – Degree – 90% correct

To develop behavioural objectives a learning task must be broken down into smaller components through analysis into specific measurable tasks. The learning success may be measured by tests developed to measure each objective.

The advent of behavioural objectives can be traced back to the Elder Sophists of ancient Greece, Cicero, Herbart and Spencer, but Franklin Bobbitt developed the modern concept of behavioural objectives in the early 1900s (Saettler 1990 in Mergel 1998).

The behavioural objectives are stated to elicit a desired behaviour from the topic in question. Well stated behavioural objectives give further guide to the producer. The producer at each stage in the production process would always ask the questions 'Would the learner achieve the desired behaviour through this process? what method would make the learners attain the desired behaviour?'. The producer considers the set objectives each time a new idea is to be incorporated into the process of production. Further to this, let's look at the Taxonomy of Learning Objectives.

Taxonomic Analysis of Learning Behaviours

- Bloom's Taxonomy of Learning – in 1956 Bloom and his colleagues began the development of a taxonomy in the cognitive, attitudinal (affective) and psychomotor domains. Many people are familiar with Bloom's Cognitive taxonomy:

  - knowledge
  - comprehension
  - application
  - analysis
  - synthesis
  - evaluation

- Gagne's Taxonomy of Learning – Robert Gagne developed his taxonomy of learning in 1972. Gagne's taxonomy was comprised of five categories:
  - verbal information
  - intellectual skill
  - cognitive strategy
  - attitude
  - motor skill

- Gagne's and Brigg's Model
  - Action
  - Object
  - Situation
  - Tools and Constraints
  - Capability to be Learned

By the late 1960's most teachers were writing and using behavioural objectives. There were, of course, people who questioned the breaking down of subject material into small parts, believing that it would lead away from an understanding of the "whole" (Saettler 1990 in Mergel 1998).

A well stated behavioural objective would serve as a guide through out the process of designing an instruction.

3.1.3 The Audience

In teaching and learning the audience are usually the learners. It should be noted that the learners are not of the same age and academic abilities.

A topic for example 'Parts of Speech' may be taught to different grade of students. It does not mean that because it is the same topic then it must be taught the same way to the learners in spite of their age and academic differences. The knowledge has to be passed on in such a way to meet with the learners' age and abilities.


Pictures of different age group of learners

The pictures above show learners in different age group. One may want to know which is most important in production, is it the biological age or the level of academic attainment. Both are important. Findings attained from great researchers show that learning goes with age. Certain age groups have certain level of intelligent quotient that is why in teaching and learning the rule of 'moving from simple to complex' is encouraged. That does not mean there are no exceptions. There are learners whose biological ages are 16 years but reason and behave like 4 or 5 year old child.

Another criterion to be considered is the learners' previous knowledge. What has the learner learnt to do in relation to the new knowledge to be learnt? This goes with the rule of moving from the known to the unknown which makes learning much easier. Another question of thought is 'how to relate the previous knowledge to the new knowledge?' Create a link of the previous and the new knowledge during production. This would make the new knowledge more meaningful to the learner.

It may also interest us to know that that the criteria are not limited to only the age and previous knowledge but, inclusive of:

- Health
- Environment
- Culture
- Religion
- Language
- The Law
- Economy

Each of this has its role to play in the production of multimedia.

3.1.4 Resources

This includes both personnel and material resources required in the production of multimedia in teaching and learning. Examples of such resources are – programmers, video editors, digital cameras, scanners etc. The producer needs to ensure that he has the required personnel and material resources in the production in line with the stated objectives. Where a lack is noticed, an alternative could be made.

The producer needs to identify the actual competency required from the personnel and define the level of commencement and termination of a task. A lack in the appropriate resources could lead to poor production.

Where the producer is not the script writer, the knowledge of an expert in the field of study is required to ensure the content required for the course.

3.1.5 Theories and Models

A good production must have a guide from basic theories and models. It is therefore important for us to know what theories and models are as well as their implications for Instructional Design.

- What is theory?
  - A theory provides a general explanation for observations made over time.
  - A theory explains and predicts behaviour.
  - A theory can never be established beyond all doubt.
  - A theory may be modified.
  - Theories seldom have to be thrown out completely if thoroughly tested but sometimes a theory may be widely accepted for a long time and later disproved.

  (Dorin, Demmin & Gabel, 1990)

- What is a model?
  - A model is a mental picture that helps us understand something we cannot see or experience directly.

(Dorin, Demmin & Gabel, 1990)

A theory provides a general explanation for observations and explains the behaviour whereas a model is a mental picture that helps us to understand something that we cannot see or experience directly (Dorin, Demmin and Gabel, 1990).

Reigeluth (1999) states four major characteristics that all instruction design theories have in common. These are:

- Design orientation,
- Identification of methods of instruction and situations,
- Methods of instruction that can be broken into more detailed component methods, and
- Choice of probabilistic Methods,
- Methods that best facilitate learning under different situations,
- Learning tool features that best allow an array of alternative methods to be made available to learners,
- System features that best allow an instructional design team to design quality learning tools.

(Adopted from COL 2003)

Here are some of the theories which are commonly used in instructional design:

Behaviourists – believes a change in behaviour as the outcome of learning. Their principle of reinforcement, retention and transfer of learning are important in instructional design. Another area of importance is the behavioural objectives which allow the learners to know specifically when they have achieved their objective. In this way they are able to monitor their progress.

Cognitive psychologists – sees learning as an internal process that cannot be observed directly. They emphasize memory in connection on how the human mind works. The implication of this design on instructional design is that it encourages the use of different techniques for storing and retrieving information as well as practice exercises in self-learning material.

Constructivists – believes in an open ended learning experience. In this instance methods and results of learning are not easily measured and are different for each learner. Constructivists implication on instructional design is that the learners should attach themselves to the content domains also they believe that learning occurs when it is situated, contextual, problem based, social and authentic.

In conclusion:

- Behavioural approach can effectively facilitate mastery of the content,
- Cognitive strategies are useful in teaching problem solving tactics, and

- Constructivist strategies are suited for dealing with ill defined problems.

(COL 2003)

Theory	Psychologists	Descriptions
Behaviourism	✔ John B. Watson ✔ Ivan Pavlov ✔ E. L. Thorndike ✔ B. F. Skinner	• Behavioural researches have been conducted on animals but are related to human behaviour. • Based on observable changes in behaviour which can be measured. • Learning results from the classical conditioning of simple reflexes. • Learning is the formation of a connection between stimulus and response.
Cognitivism	✔ Jean Piaget ✔ Lev Vygotsky ✔ Bruer Jerome ✔ David Ausubel	• Cognitive Psychologists studied human behaviour. • Theory is based on the thought process behind the behaviour. • Learning involves associations established through contiguity and repetition. • Stressed on the role of reinforcement which provides feed back about the correctness of responses. • Learning involves subsuming new material to existing cognitive structure.
Constructivism	✔ George Herbert Mead ✔ D. H. Jonassen ✔ D.N. Perkins	• Learners construct their own perspective of the world, through individual experiences and schema. • Learners construct their own knowledge. Learners are encouraged to search for other related relevant information. • Prepare the learner to problem solving ambiguous situations.

(COL 2003)

Models of Instructional Design

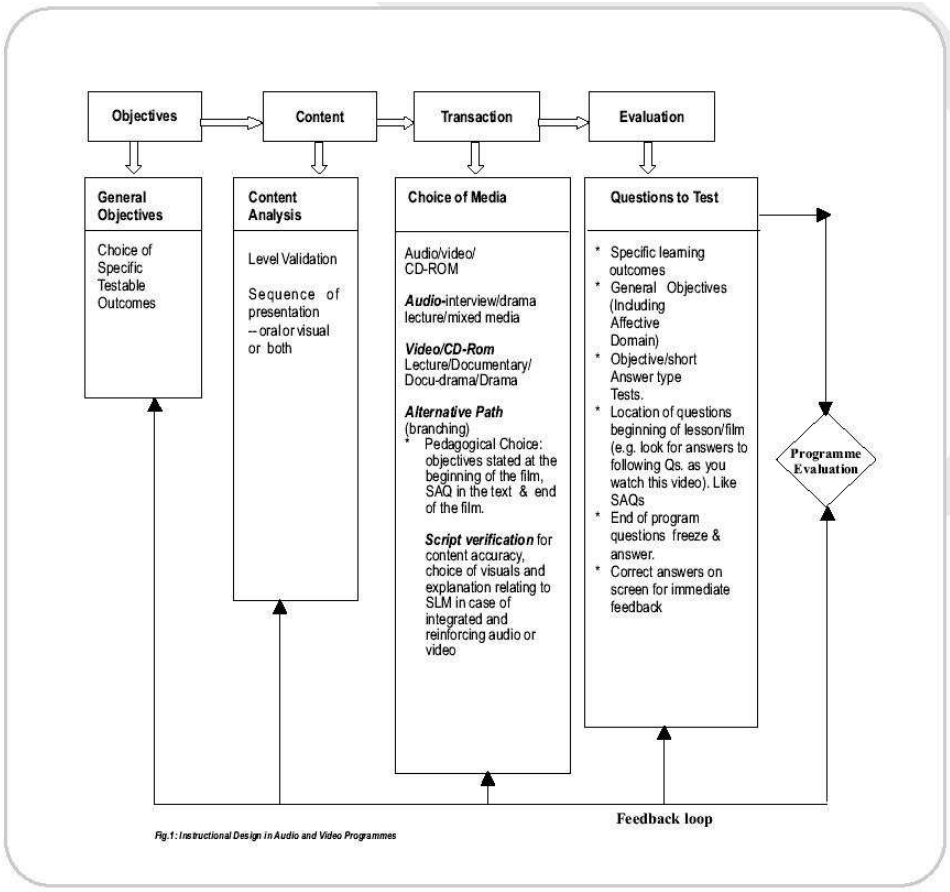
Models of Instructional Design	Description
Gagne-Briggs Model	To design instruction • Categorize learning outcomes • Organize instructional events for each kind of learning outcome • There are nine instructional events • Events are tailored to the kind of outcome to be achieved • Model is adapted to Web Based Instruction
David Merrill	The model by David Merrill (Component Display Theory) is based on the following assumptions • Different classes of learning outcomes require different procedures for teaching and assessment • Teaches individual concepts • Classifies objectives on two dimensions • Formats instruction to provide student directed teaching
Dick and Carey	This model • Uses a systems approach for designing instruction • Identifies instructional goals in the beginning and ends up with summative evaluation • Is applicable for K-12 to business to government
Hannafin and Peck	The Model has three phases • Need assessment is performed in the first phase • Second is the design phase • Instruction is developed and implemented in the last phase All the phases involve a process of evaluation and revision
Gerlach and Ely	The Model • Includes strategies for selecting and including media within instruction • Is suited to higher education

Source: http://its.ncsu.edu/guides/instructional_design/selecting_models2.html

(COL 2006)

3.2 The Script

Before discussing script writing, it is important you know what is required in Instructional Design for Multimedia. This is shown in the table below:



(COL 2003)

What is a script? Who is to write the script?

To get the answers to the above questions read the following carefully. The passage is adopted from the Commonwealth of Learning (2003)

The script – sometimes also called a storyboard – is the basic building block of multimedia courseware development. The storyboard is a sequence of simply drawn pictures that visually depict a programme. In preparing interactive multimedia, normally the script is a storyboard. At such, both the terms – script and storyboard – are used interchangeably, though they have their differences. The differences being that a script can also be written without visuals at all, whereas a storyboard is always a visually illustrated script. In this section we will describe a process for developing visual scripts or storyboard for multimedia. The script in practice becomes the blueprint for action. We present to you in this section a simple method for representing hypermedia-based information in 2-dimensional format.

Visual Thinking

Preparation for a multimedia script is a process of visual thinking or visualization. The dictum is – "Think Visually". In order to think visually, you need to create an overall conceptual design of the programme that you are planning to make. Creation of mind maps of the content area is a good first step. However, the words in the mind map must synchronize graphically. When you have an idea, consider relating it to some graphics and see how the idea can be represented graphically.

The process of visualization is basically section, creation, and editing of images into a meaningful sequence. In reality it takes a lot of practice to "see" the programmes to be developed successfully.

Scriptwriting Process

The scriptwriting process has the following stages:

v) **Programme idea:** The programme idea needs to be discussed vis-à-vis the strength of multimedia. You must ask at this stage: why is it necessary to have a multimedia programme for this particular idea?

ii) **Programme brief:** At this stage, the programme ides needs to be expanded to include the title, target audience, objectives of the programme, content outline, etc. A rationale for the multimedia programme and project beneficiaries is useful, if included in the programme brief.

iii) **Research**: Planning and carrying out a thorough research on the topic of the programme idea and the target audience will be useful in designing the multimedia. Identifying relevant graphics content and experts on the programme will be useful to consult and select appropriate content.

iv) **Identify and select content elements**: Having done the research, it is appropriate to develop the best way or a sequence to deliver the message. Though multimedia provides the user with a hypermedia navigation opportunity, it is important to have a
'default' sequence. The content elements can be visualized in terms of text, audio, video, graphics animation, etc.

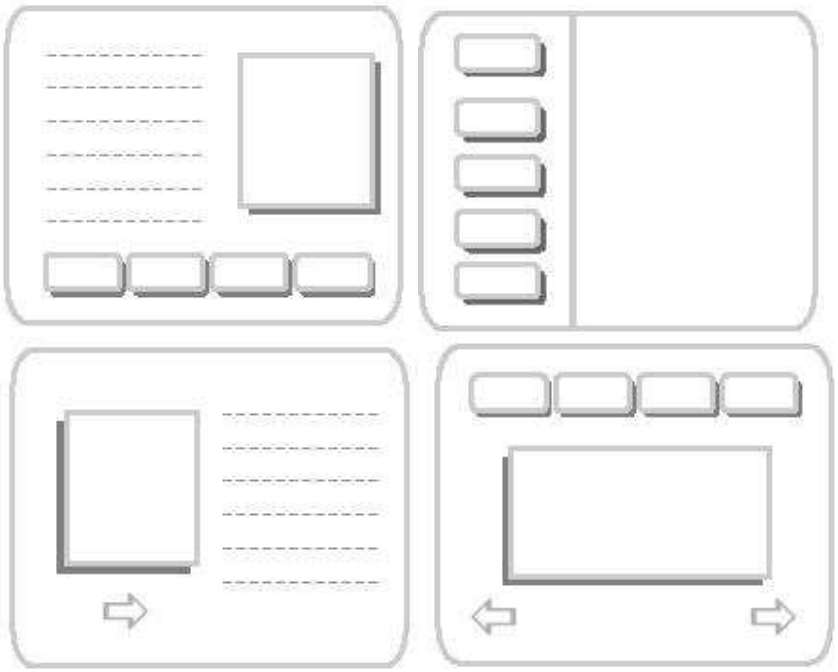
v) **Interface design and layout**: The interface design is one of the most creative stages of scripting for multimedia. Here, the look and feel of the programme needs to be decided. While deciding

on this, it is important to keep in mind the target audience's choice and the nature of the topic.

There can be so many ways of designing the interface depending on the creativity of the designer. However, it is essential to decide on one layout design in the beginning and stick to that for uniformity and also for the reason that the learners will not appreciate a different layout for all different screens of the multimedia programme.

vi) **Preparing the storyboard**: The storyboard is a detailed shot-by-shot or screen-by-screen description of the programme on a sheet of paper or card. The storyboard forces the scriptwriter to think in terms of multiple media use in a multimedia programme. It is also a blueprint for action that can be given to a multimedia designer to execute as depicted in the storyboard. It allows working of different groups of people in the same project developing different components of it with similar design and compatibility. We will now present to you a systematic approach to prepare storyboard for multimedia.

Though we recommended the systematic approach suggested in this section, it is important to say here that it is one of the many way of preparing multimedia storyboard, and therefore, we would not like to be very prescriptive.



Examples of Layout Designs

Storyboard Development

Before we start developing a storyboard, let us look at the various media components of a multimedia programme. The multimedia being an integrated platform it can deliver text, audio, visuals (video and graphics), animation and also the interactive feature, which is called navigation. So the storyboard should represent all the five components in a 2-dimensional page or card. Since, multimedia is a hypermedia-based system, in figure 2 we represent five different cards placed over one another to depict a single screen/shot of a programme.

In figure 2, we see a screen shot that has some visible texts, graphic visual (which may be animated or static), and a navigation button. This frame might have some audio. But, in the storyboard here, it is not visible. When we separate the stack of cards, we will see how various components are depicted in each card. It is not necessary that all the components are present in every shots/screens. For example, figure 2 do not have a video. Interestingly, if you use a transparency sheet for each of these cards, the storyboard can be represented as one integrated screen shot. The illustration in figure 2 depicts that for each screen shot you need to prepare five cards.

Figure 2: Screen shot of a multimedia prototype

Let us see each of the five cards.

Text: Write down the text that you expect to go in the screen. Suggest any specific design feature, including font size, style and colour that you need. Also suggest the placement of the text in small chunks of less than 200 words. This is important for presentation of the text in readable way. If it is essential to have more text, multiple shots can be used in continuation.

Audio: Audio is of three types -- Narration or Voice Over (VO), Music (M) and Sound Effects (SFX). In this card, you have to specify the types of audio to be used. As you can have two audio channels in one shot, it is important that you specify both audio channels. If required, use two cards for audio. Specify the kinds of music you want and the kind of sound effects required. If you have voice over, prepare the script of the voice and write it on the card.

Visual: A visual can be of two types -- static and motion, the former is called **graphics** and the later **video**. In the visual card you have to specify the kind of visual and its placement on the screen. Also it is very important to give a description of the graphics or video used. Then a description of what it will show, its purpose etc are required in the storyboard.

Animation: There are various kinds of animation activities. For example, you can animate a text or graphics or you can have a spcialised animation programme itself in the multimedia lesson. The nature and purpose of animation needs to be explained in this card with specific movements (fade in, fade out; zoom in, zoom out, etc.) of different elements.

Navigation: The navigation is the mechanism through which a multimedia programme moves from one shot to another. Being hypermedia based, the navigation actually enables the user of the multimedia to navigate from one shot of the multimedia to any other shot (provided it is designed so). The navigation plan can be designed through hyperlink from a word/ sentence / phrase or from or graphics or button for navigation. Some of the important navigation buttons are start/begin/, end, next, previous /back, home, etc. In the navigation card you have to specify the type of navigation button and its action (what will happen, if it is clicked, e.g. Go to S-3). The placement of the buttons and/or hyperlinks also needs to be specified.

A multimedia programme will have a number of screens/ shots, and therefore organizing the cards is very imported. So we suggest you to name these cards as S-1/T (for text of shot 1), S-1/A (for Audio of shot 1), S-1/V (for visual of shot 1), S-1/ An (for animation of shot 1), S-1/N (for navigation of shot 1) S-2/T (for Text of shot 2) and so on.

The number of shots in a storyboard will depend on the content that you have and how you are presenting the multimedia. For an educational multimedia lesson, we can suggest below few standard shots. However, the multimedia based lesson is also dependent on the instructional design that you follow for the programme. Some of the standard screens/shots are:

- Title (normally referred as the home), which welcomes the learner;
- Introduction, which depicts the context and sets the tone of the programme;
- Objectives
- Contents/ Structure / Index
- Glossary
- References
- Self- Assessment Questions

Apart from all these, the content of the lesson will also have a number of shots. Depending upon the requirements, the above shots can be depicted on more than one shot.

Scripting for multimedia and preparation of storyboard is a highly systematic process and requires a certain amount of discipline to organize the cards. Analyses and breaking of the contents into smaller, manageable chunks or objects will fasten development of the storyboard as well as the multimedia. A clear storyboard is the key to a successful and effective multimedia lesson. The storyboard should be reviewed by experts and surrogate users of the multimedia, especially for the navigation part to see the smooth flow of the multimedia programme.

In the next section we will discuss about various components of multimedia.

SELF ASSESSMENT EXERCISES

Questions:

1. State the tenet of a good behavioural objective.
2. State the basic theories in learning.
3. State in a sentence each, the view of each theory.

Answers:

.

1. A good behavioural objective must be stated in specific, quantifiable, and terminal behaviours.

2. The main basic theories in learning are:

   - Behaviourism traced back to Aristotle, Pavlov, Thorndike, Watson and Skinner.
   - Cognitivism is associated with Edward Tolman
   - Constructivism is associated with Bartlett as the pioneer of this approach.

3. Behaviourism focuses on a new behavioural pattern being repeated until it becomes automatic.

   With Cognitivism, changes in behaviour are observed and used as indicators as to what is happening inside the learner's mind.

   Constructivism focuses on preparing the learner to problem solve in ambiguous situations.

4.0 CONCLUSION

A good multimedia production would have a basic of a good content which leads to the writing of a good script. It is therefore important that a multimedia producer considers the in-depth of the course content before final production, failing which an amateur type of production may be arrived at.

5.0 SUMMARY

In multimedia production process, the content and the script are the first to be considered so as to achieve a meaningful production. The content contains the topic, behavioural objectives, audience, resources and the theories/models. The practical application of theories and models are

suggested. It should be noted that there is no one best theory for production, rather the theory or theories used is determined by the type of knowledge that is to be passed on to the learners. Therefore one or more theories could be applicable.

A good organisation of the content leads to script writing, which is written by the subject teacher or someone who is an authority in the discipline.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

1. Choose a topic and develop a good content for multimedia production.

2. Write a simple script on the above.

7.0 REFERENCES/FURTHER READING

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UNIT 2 TOOLS REQUIRED IN MULTIMEDIA PRODUCTION

CONTENT

1.0 INTRODUCTION

Like in the 'garri' production illustrated above, certain tools like cutlass, hoe, digger etc were used by the producer in the process of production before the final product was achieved.

It is important to know the right tools required in a particular production process if the desired end product is to be attained. A default in the tools used may lead to a change in the desired end product therefore ensure that the tools selected are the right tools needed to attain the set behavioural objectives. This is also applicable in multimedia production.

2.0 OBJECTIVES

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

- Identify the tools required in multimedia production.
- Explain the important of each tool in production process

3.0 MAIN BODY

In multimedia production, the tools required are usually of two types – human and equipment often times they are referred to as a project team.

A multimedia project team consists of a number of people; each specialises in different areas within the multimedia industry. This shows that a good multimedia production can not be accomplished by just one person.

Human

Clients/Subject Matter Exerts (SMEs):

- participate in the content and needs analysis phases;
- develop content;
- assist in the design of the overall project;
- participate in the final testing procedure.

The Project Manager:

- liases with clients;
- prepares agreements, sign-offs and timeliness;
- manages project teams;
- keeps projects on time and on budget;
- keeps track of all project documentation;
- manages the external testing procedures if required; and
- manages the replication process.

Production Manager:

- develops, documents and implements effective production processes;
- manages and/or undertakes significant internal projects, as identified by the Head, TEDI, ER; and
- supervises specific production staff.

The production team can also include:

- a video production unit (external);
- a video digitising unit (external);
- a sound production unit (external);

- voice or video talent (external);
- data entry staff (internal or external, dependent upon needs); and/or a
- software testing house (external).

Instructional Designers:

- scope and quote on projects;
- provide advice on the educational aspects of the project;
- ensure that the final design and final project are educationally sound;
- work closely with the project team, including the client, throughout the design and development phases;
- provide content advice and ensure that the content provided by the client is formatted in a way that is useful to the project team;
- prepare all project documentation (with the exception of timelines, agreements and signoffs which are the responsibility of the project manager, and technical and graphic design specs, which are done in close combination with other members of the project team);
- carry out internal testing;
- write the help files/inserts/instructions for users; and
- assist with the evaluation processes.

Graphic Designers:

- scope and quote on projects;
- design and develop the major interface artwork;
- design and develop global interface items (e.g. buttons, scrollbars, dialogue boxes);
- design and develop additional interface items (e.g. notepad, glossary, file folder, library book, title screen, credits screens, help screens etc.); and

- prepare graphic design specifications documentation in conjunction with the instructional designer.
- Prepare CD-face artwork, insert artwork (the booklet in the front of a CD case) and inlay artwork (at the bottom of a CD case);
- scan and optimise images;
- create content illustrations, diagrams and figures; and
- create animations (3-D or 2-D, complex or simple).
- carry out internal testing and graphics

Programmer/Software Developers:

- scope and quote on projects;
- do program analysis and design;
- select, adapt and design algorithms;
- design databases and data structures;
- design databases and data structures;
- design fine-grained interface layout and behaviour; and
- prepare technical specifications;
- program (using Lingo, Visual Basic, C++, Ms Access, CGI, ASP, etc.);
- author (using Lingo, Visual Basic, C++, MS Access, CGI, ASP, etc.);
- document code;
- incorporate all interface graphics;
- incorporate all content (including diagrams, animations, text, video, sound, images, etc.); do incremental testing of code modules; and
- burn gold master CDs.
- Carry out internal testing, debugging and editing.

Elements Developers:

Elements such as WebCT and ATutor. There are about 150 such elements which give opportunity to multimedia users to upload their Instruction into the Web. Which ever one that is used, the following are important.

- quote on a project;
- develop the HTML components;
- implement and configure WebCT tools;
- customise the interface;
- carry out internal testing; and
- support clients via the WebCT Help Desk.

Prepared by Lara J. Ross TEDI, 1999

It may also interest you to know that it is not all the time you need an Element Designer. Some are free such as the ATutor. All that is required in this instance is to be taught how to upload your instructional material into the ATutor.

Where does the teacher come in?

The teacher is the *Instructional Designer*. He oversees every other aspect in the production process to ensure that the desired educational goal is attained. The teacher as the instructional designer features in all the process of production. He acts as a bridge between the team workers and the client (learners). It is important that the teacher is familiar with at least one Element, he/she does not need to be the producer but a user.

It should be noted that most times Educational Multimedia Production is usually meant for mass education and therefore involves the entire human resources mentioned above. Sometimes, they may not all be involved if the production is meant for a small group. For example there may be no need for a programmer or a Element designer if all that is required is to give a straight teaching to the learners using CD-ROM or to use already existing Element.

Note: The functions of each team is stated underneath each sub-heading

Equipment For Multimedia Development

The major equipments used are grouped into Hardware and Software. From previous discussions you were told that the computer – hardware combines sound, images and motion together for multimedia purpose. Let us look at the different distinctions –

Hardware	Software	Yourself
↓	↓	↓
Computer	Tools for developing Multimedia	Conceptual understanding and skills

Concentration will be on Microsoft windows platform. There are other platforms, such as Apple Macintosh, Silicon Graphics, Sun Microsystems and Mainframes.

Anther important aspect of multimedia production is the Operating System. An operating system is the program that is responsible to manage all other programs in a computer e.g. Linux and Windows 2000, while example of an application program is Ms-Word. Examples of hardware and software are shown below:

Hardware

1. System devices
2. Memory and Storage devices
3. Input devices
4. Output devices
5. Communication devices

System Devices

- Microprocessor
- Motherboard and memory

Memory and Storage Devices

- Hard disk
- Floppy disk

Input Devices

- Keyboard
- Mouse
- Microphone
- A digital camera (for still and motion pictures)

Output Devices

- Printer
- Amplifier (today, speakers have inbuilt amplifiers)

Communication Devices

A modem modulates digital signals going out from a computer or other digital device to analog signals for telephone line and demodulates the analog signal to convert it to a digital signal to be inputted in a computer.

In addition, the following are also part of hardware to be considered:

- Video capture (need a video capture card). For example for a full motion video, the card must be capable of capturing about 35 frames per second.
- Sound Card e.g. creative Lab's Sound Blaster is a standard sound card.

Multimedia Design Software

- Painting and Drawing Tools – e.g. Corel Draw
- 3 – D Modeling and Animation tools – e.g. 3D studio Max, is applicable in web pages, designing adverts, making cartoons films and in creating multimedia based instructions
- Image Editing tools – e.g. Adobe Photoshop and paint shop
- Sound Editing Tools – e.g. Cool Edit (with this you can cut, copy and paste). It can also be used to record your own music, voice or any other audio. Sound Forge is another professional quality sound editing tool.

- Animation Video and Digital Movie Tools e.g. Adobe Premiere and media shop pro. It can edit video and multimedia movies in AVI as well as MPEG format. Media studio pro also gives you the most complete set of advanced video editing.

For creating animations Macromedia Flash is the industry standard. A file created in Flash is called a movie. A movie in flash occupies very less file size that is why is very popular for web.

Multimedia authoring tools are which organize and edit your multimedia project. They are used to design the user interface for presenting the project to the learner i.e. used to assemble various elements to make a single presentation. The major type of authoring tools are:

1. Page based tools e.g. Visual Basic, Tool book
2. Icon based authoring tools e.g. Author ware
3. Time based authoring tools e.g. Macromedia Director
4. Object Oriented tools e.g. media forge

In choosing software for multimedia purpose, consider:

- Usability
- Animations
- Smoothness and
- Integration

These should be considered in line with the topic and objectives set.

SELF ASSESSMENT EXERCISES

Questions:

1. Name the different types of human resources required in the production of multimedia.
2. List the various types of equipment required in multimedia production.

Answers

1. - Client/Subject matter experts
   - Project Managers
   - Production Managers
   - Instructional Designers
   - Graphic Designers
   - Programmer/Software Developers
   - WebCT Developers

2. - personal computer;
   - scanner;
   - video camera;
   - digital camera;
   - server
   - multimedia projector;
   - authoring tools e.g. macromedia flash. Etc.

4.0 CONCLUSION

Educational multimedia production could either be specific or general. It is specific when it is meant for a certain group of persons and general when it is meant for mass education. When it is general, all the tools listed above need to be involved in the production process but when it is specific, it may not be necessary to use all the tools rather the selection of the tools would be suggested by the targeted audience and the content.

5.0 SUMMARY

Educational multimedia tools are grouped into human and non-human. The human comprises the clients/subject matter experts, project manager, production manager, instructional designers, graphic designers, programmer/software developers and WebCT developers. They all

perform different functions in the course of development. The non-human is the equipments required for production. They are – personal computer, scanner, video camera, digital camera, multimedia projector, authoring tools etc. It is not compulsory that they must all be used in every production. The audience and the content determines what tool to use.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

1. What is the role of a teacher in multimedia production?
2. Carefully explain the relationship of Client/Subject Matter Experts and Instructional Designers.

7.0 REFERENCES/FURTHER READINGS

Lara J. Ross (1999), Teaching and Educational Development Institute. The University of Queensland.

UNIT 3 PRODUCTION PROCEDURE

CONTENT

1.0 INTRODUCTION

Like we saw in unit one in the production of garri, there are specific procedures in the production cycle of every product in which multimedia production is not different. This unit would therefore take us through the various stages of multimedia production cycle.

2.0 OBJECTIVES

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

- Explain the various stages in the production of multimedia.

3.0 MAIN CONTENT

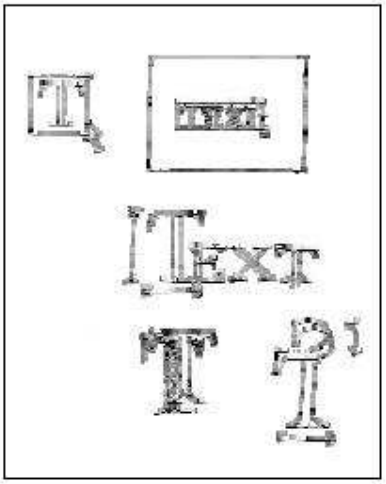
Multimedia technology is becoming increasingly popular in the field of education. Interactive multimedia courseware in particular, developed on a CD is adding a new and interesting dimension to both teaching and learning. This new approach can effectively complement the conventional methods of learning and teaching. The multi-sensory input of this media provide possibilities for higher performance ratings and higher retention. With effective feedback, this method makes learning and teaching more meaningful. Students with different learning abilities can work at their own place, time and pace; and with interactivity and self-assessment it can make learning a highly personalized, independent and a rewarding experience. The learner can also set her/his own "view" of the information available to him/her. A significant aspect of multimedia in education is related to authoring or developing multimedia. Multimedia authoring as a form of computing has made it possible for students and teachers to construct knowledge and discover worlds which do not exist in conventional methods of learning or teaching. Above all, the new experience has defined a new concept for edutainment – a combination of education and entertainment.

In this section, we will discuss some aspects of the 'how' of developing the multimedia, especially the components of multimedia, and the good practices in preparing text, graphics, audio, video, graphics, etc. for including in a multimedia programme.

Text in Multimedia

Text is the most common medium of presenting information. It is also used to communicate a concept or an idea. It should effectively complement the other media. Factors that influence the textual communication are typeface, font and style, kerning, antialiasing, animation, special effects, special characters and hypertext .While dealing with text in multimedia it is very important to note that it is not the only means of communication. In multimedia, text is most often used for titles, headlines, menus, navigation and content. Overcrowding of text on a single page should be avoided.

It is recommended that text should be presented in combination with graphics.



Typeface: Typefaces are broadly categorized into two types - 'serif' and "sans-serif". Serif is the small decoration at the end of the letter stroke while sans serif is the letter without a decoration. Serif fonts are commonly used in the body of the text,

while sans-serif fonts are used for headlines and bold statements.

Fonts: A font is a collection of characters of single size belonging to particular typeface family. Style and size are the main attributes of a font. Common font styles are bold and italic. Font sizes are expressed in points. A point is approximately 1/72 of an inch.

In the usage of fonts, it is recommended to vary as few number fonts as possible on the same page. The style, size and kerning may be adjusted as and when necessary. Anti-aliased text may be used for titles and headlines. Bold text may be more suitable to convey an idea or a concept. Text can be made attractive and pleasing to the eye by choosing the combination of colors for the font and background. Care should be taken for selecting the appropriate type of fonts on menus and buttons, symbols and special characters.

Text Animation: Presentation of text can be more fun and interesting through animation. A wide variety of methods are available to animate the text. Some of the methods are: scrolling (vertical and horizontal), zoom-in and zoom-out, fade-in and fade-out, dissolve etc. 3D text also has an impressive look. Care should be taken to introduce animation only at selected places where the presentation is most impressive. Authoring Programmes like Macromedia's Director have built in tools to animate text.

Kerning: It refers to adjustment of the space between two characters. Kerning makes certain combinations of letters, such as WA, MW, TA, and VA, look better. Only the most sophisticated word processors and desktop publishing systems perform kerning. Normally, you can activate or deactivate kerning for particular fonts.

Anti-aliasing: Aliasing is the well-known effect on computer screens, in fact, on all pixel devices where distortions occur at the edges of letters, in the case of text presentation. Anti-aliasing is the technique of making the edges smooth. Anti-aliased text is often called "grey-scale" text. Certain adaptations of anti-aliasing have enhanced both the legibility and aesthetics of on-screen type.

Hypertext: The function of hypertext is to build links and generate an index of words. The index helps to find and group words as per user's search criteria. Hypertext systems are very useful in multimedia interactive education courseware. Hypertext systems provide both unidirectional and bi-directional navigation. Navigations can be through buttons or through simple, plain text. The simple and easy navigation is through linear hypertext where information is organized in linear fashion. Non-linear hypertext, however, is the ultimate goal of effective navigation.

Audio in Multimedia

Audio is another vital media in a multimedia presentation. Audio is available in different file formats and the appropriate file format is chosen to maximize its performance. Sound editors play an important role for converting file formats and also for enhancing the quality of sound. In most cases sound files are imported and edited for a multimedia application.

Digital Audio: The Sound recorded on an audio tape through a microphone or from other sources is in an analog (continuous) form. The analog format must be converted to a digital format for storage in a computer. This process is called 'Digitizing'. The method used for digitizing sound is called sampling.

Sampling Rate: Sampling rate is defined as the number of times the analog sound is sampled during each period and converted into digital information. Sampling rates are measured in Hertz (HZ or Kilo HZ). The most common sampling rates used in multimedia applications are 44.1KHZ, 22.05JHZ and 11.025KHZ. Higher rates of

192KHZ will probably be the professional DVD standards in future. Higher the sampling rate, higher is the quality of sound. A higher sampling rate however occupies more disk space. One can convert from a higher sampling rate to a lower rate (Down Sampling) when required.

Sound Bit Depth: Sampling rate and sound bit depth are the audio equivalent of resolution and color depth of a graphic image. Bit depth depends on the amount of space in bytes used for storing a given piece of audio information. Higher the number of bytes higher is the quality of sound. Multimedia sound comes in 8-bit, 16-bit, 32-bit and 64-bit formats. An 8-bit has 28 or 256 possible values; a 16-bit has 216 or 65,536 possible values. A single bit rate and single sampling rate are recommended throughout the work. An audio file size can be calculated with the simple formula:

File Size in Disk = (length in seconds) x (sample rate) x (bit depth /8 bits per byte).

Mono or Stereo: Opting for mono may be a good choice as the file size is doubled for stereo. However stereo may be used only at those places where the requirement is a must.

Digital Recording: Digital sound can be recorded through microphone, keyboard or synthesizer or DAT (Digital Audio Tape) .Recording through a microphone connected to a sound card directly is not recommended as it is difficult to control the recording consistency and also to avoid amplification of noise. A better practice would be to record on a tape recorder after making all the changes required and then record it through sound card.

Sound Editors: Sound editors are very useful in creating sound, transforming file formats, and enhancing the quality of sound by cutting the noise. There are 3 sound editors used very frequently for multimedia applications. *Sound Forge*, *Cool Edit* and *Sound Edit 16*. Sound Forge for PC is regarded as probably the best software for audio recording and editing. Cool Edit, a low cost software, is easy to use giving a fairly good quality of sound. Sound Edit 16 allows you to record, edit and transform digital audio easily and quickly. It can be used to produce a variety of digital speech, sound effects and music clips.

Sound File Formats: The most common sound file formats are:

WAV	Window wave format
AIFF	Audio Interchange File Format -(wave form for use on MAC)
AU	Wave format developed by SUN Microsystems

MP3	Compressed file format using MPEG1 Layer3 compression
QT	Digital audio quick time movies that contain only audio can be used in multimedia applications.
SWA	Shock Wave audio files compressed up to a ratio 176:1

The choice of the right format to use depends upon the file size, the nature of application and the operating system.

Video in Multimedia

Video in multimedia is an extremely useful communication tool for presentations. It illustrates ideas and concepts besides capturing real world events. Video files occupy enormous space and so there are two choices to recommend:

1) Use very short video clips (not exceeding a minute or two)
2) Use highly compressed video files like MPEG. AVI files that can be transformed to MPEG files.

Digital Video: Digital video provides a superior means of communicating images and sounds of real world. Digital video has many more controls than digital audio, although both of them deal with time-based medium in the midst of a frame based medium.

Frame Rate: It is the number of frames per second that are displayed on the screen. A rate of 15 frames per second (fps) is recommended for most computers, although it cannot match the high quality of 30 fps.

Video Formats: The most commonly used video formats are:

AVI	File format developed by Microsoft for windows. It is also known as video for windows (VFW).
MOV, MOOV, QT	Files belong to Apple Quick Time Movie. Flattened quick time video clips can be viewed on Unix workstations and on IBM compatible PC with media players.
MPEG,MPG	MPEG files use the MPEG-1 video compression routine. MPEG video clips can be viewed with IBM compatible PC and on Unix workstations.

Colour Depth for Digital Video: Digital video set at 24-bit are recommended for windows for an 8-bit or 16-bit images video performances through video editing.

Video Compression: As digital video files occupy a large bandwidth and extremely large space as compared to audio and graphics file formats, reducing the file size is of utmost importance. A number of CODEC methods are available to meet this requirement. The MPEG format for example uses inter-frame compression to get compression up to 200:1. This large compression is achieved at the expense of the quality of video. The inter-frame compression involves cutting out the visual information that is not noticeable to the human eye.

Video Editors: The popular softwares for video editing are Adobe Premiere 6.0, Pinnacle systems, Studio DV, Apple's Movie 2.0.1 and CoolEdit. For editing the analog video is first digitized through a video capture and then the appropriate software is used for editing. If a DV camcorder is used for video shooting then the video can be transferred to PC directly for editing. It is very important to note that video takes enormous disk space as much as 200MB per minute. So preview of the video and editing are done separately to suit one's requirement. The safest rule is to keep the video file size to absolute minimum.

The PC must be adequately equipped with a minimum of 20GB hard disk and a minimum of 128 MB RAM and with a good AGP card with 32 MB VRAM.

iMovie

Apples iMovie for MAC is regarded as the most powerful and also extremely easy to use making it the right choice for both amateurs and professionals. The output of iMovie is a fast creation of quick time video. The software also includes a number of special effects.

Studio DV

PC counterpart of iMovie is studio DV of Pinnacle systems. This edition is also good for beginners and the package includes a video capture card. It auto detects and capture individual scenes within a video tape. The final movie can be exported to Quick time.

Adobe Premiere

Premiere is often referred to as a best video editing option for PC. It has a highly customizable interface with a precise timeline editor and with great special effects tools. The package includes a Total Training CDROM. The output movie can be exported to a variety of video formats including windows media player

Graphics in Multimedia

Graphics is the most commonly used element of multimedia. The richness of multimedia and the effective communication are through graphic presentations. The attributes of color, texture, pattern and animation enrich a multimedia presentation.

The compelling, immediate problem in graphic production is to locate a source of visual imaging or to create one.

Types of graphics: The two approaches in designing graphics are: a) Rastor graphics; and b) Vector graphics. Rastor graphics, commonly known as bitmap images are based on a grid of pixels; vector graphics are based on mathematical formulas. Bitmap images are associated with 'paint' or 'photo'. Vector graphics occupy lesser memory and are easily 'scalable' i.e there is no loss of resolution when the image size is changed. Vector graphics are associated with 'drawing' or 'illustratation'.

Graphics formats: Some of the commonly used graphic formats are:

GIF GIF stands for Graphics Interchange Format. GIF images are very small in size and so load faster than other formats. GIF make the file size small without losing or blurring any part of the image (lossless compression). GIF also supports transparency i.e they can be pasted on the top of a background image. GIF further supports animation. GIF supports only up to 256 colours.

JPEG JPEG stands for Joint Photographic Experts Group. This format is used to display photographic images. The advantage of using JPEG over GIF is that JPEG can display up to 16 million colors (True-color). Main disadvantage of JPEG is the loss of quality. JPEG does not support transparency or animation.

PNG PNG stands for Portable Network Graphics. It was designed to be an alternative to GIF file format. PNG formats are of two types: PNG-8 format holding 8 bits of color information (Similar to GIF) and PNG-24 format which holds 24 bits of color (similar to JPEG). PNG 24 is loss less. PNG also support transparency, but not animation.

Scanning: The basic purpose of scanning an image is to digitize it i.e convert it from an analog from into a digital form. Images are typically scanned at resolutions between 50 to 1200 Dots per Inch (DPI). Image resolution refers to number of Pixels per Square Inch. This is commonly called "dots per inch" or "dpi". In general, high resolution results in better image quality. While image resolution can always be reduced after scanning, increasing resolution after scanning will not improve image quality.

Image Editing: Digitized images can be edited by any image editing software like Adobe Photoshop or JASC's Paint Shop programme. The software can be used to enhance the image quality, and do several manipulations like crop, duplicate, fill, rotate and flip the image. Deleting and adding images to another image is also one of the interesting manipulations of the editing software.

Animation in Multimedia

A very popular and a chief element of multimedia is animation. Animation is designed as a simulation of movement created by displaying a series of pictures or frames. Animation strictly is a visual illusion. It builds dynamism, energy and motion to inanimate objects. It also adds the dimension of time to graphics .Computer animation is relevant to multimedia as all the presentations are developed on the computer. The key concepts of computer animation are: key frames and tweening.

Director

Macromedia Director is a leading multimedia software package, specially suited for animation. Director is regarded by many as the first choice for multimedia course development. It has several built in tools for animation. It also includes a programming language called Lingo which enhances the performance of the presentations.

Flash

Earlier known as animator, Flash is based on vector graphics. It is a very popular package with its main attribute -- scalability. Flash uses multiple instances of the same object moving simultaneously in different points and directories to create impressive effects in the minimum bandwidth. Flash graphics have a pleasing softness and finish. Over all animation requires the combination of several tools blended creatively for maximizing the performance.

Key frames: Major frames of animation are created first. These frames define the key frames in which many changes take place. They are the 'key' points of animation. Key frames are specified to show how the moving objects will behave with time.

Tweening: Tweening is the process of generating intermediate frames between two images to give the appearance that the first image evolves smoothly into the second image. Tweening is a key process in computer animation. A software programme can automatically generate the in between frames.

Software Tools: Software used for animation determines the quality of computer animation produced. Some very popular animation software packages for windows are 3D Studio Max, Adobe Premiere, SoftImage, Animator Studio, Flash, etc. Software packages for Mac include Adobe Premiere, Elastic Reality, Strata Studio pro, etc.

Animation File Formats: The file formats for animation depends on the nature of software used. Based on this, you will have .dir (for Director), .fla (for flash), .max (for 3d studio max), .dcr (for shockwave animation file), etc.

Interactivity

Interactivity can be understood as interplay between different elements of an environment. In human context, interaction can be between people to people or between people to objects. Multimedia itself is not inherently Interactive. It can be made interactive through authoring software. In interactive multimedia, it is the user's interaction with the programmme that is explored. According to Crawford (1990) a good program establishes an interaction circuit through which the user and the computer are apparently in a continuous communication. Researches into learning styles show that students learn better through specific modalities such as visual, oral and kinetic. The goal of interactive multimedia is to provide to the student the choice of these modalities in a learning environment. Rhodes and Azbell (1985) have identified three levels of interactivity:

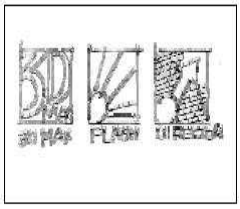
- **Reactive** There is little learner control of content structure
- **Coactive** Providing learner control for sequence, pace and style
- **Proactive** Learner controls both structure and content

Prototyping

A prototype is a miniature version of the final product. It is an incomplete product with either a reduced functionality or with a reduced set of features or both. Prototyping is a well established technique for arriving at a high quality finished product. Prototype is just the subsystem of the whole system. At any given time different subsystems are in different stages of production.

Prototype design: Prototyping forms a part of user-centered design in which the user is involved at all stages of system development process of requirements specification, design, evaluation and revision. Solution is arrived at by successive approximation and iterative design. For multimedia development, some of the components of the multimedia lesson are prepared to integrate them and demonstrate a prototype of what the final product would look like. It is at this stage that suggestions and critical feedback are received to improve the design of the programme in terms of interactivity and instructional design.

The development of multimedia courseware is a complex process of Integration and Interaction. It is an integration of a technology with learning; it is an interaction of the technology with the learner and the teacher. Both integration and interaction require planning, design and implementation. Planning involves the identification of goals, the end users and the available resources. In this section we have discussed the various components of multimedia, and have given some tips on how to prepare them, especially about their types and quality in multimedia programmes.



The multimedia technology is changing rapidly -- increasing in performance and decreasing in price. With better design of prototypes and with new or improved insights into the learning process the role of multimedia in education becomes more relevant and exciting.

In the next section we discuss how multimedia can be delivered to the learners.

SELF ASSESSMENT EXERCISES

Share yourselves into a group of five each. Get a multimedia product, using the text above, critique the product and discuss your points.

4.0 CONCLUSION

Multimedia production process has its own procedure though some times there might be variations, which may not be totally different from the above but rather has some additions or little skipping.

5.0 SUMMARY

In multimedia production, there are basic interest which include text, audio, sound and animation. Each of these requires editing which demands proficiency. This then means in multimedia production, qualified personnel must be used if one is to achieve the desired result.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

1. Itemise the functions of graphics in multimedia.
2. State the work of editors in multimedia production.

7.0 REFERENCES/FURTHER READINGS

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UNIT 4 MULTIMEDIA DELIVERY

CONTENT

1.0 **INTRODUCTION**

Now you have known how multimedia products are produced for teaching and learning. It is important that you also know that multimedia in teaching and learning does not stop at the production level, but has to get to the final consumers who are the learners. Not until it gets to the learners and well utilised it cannot be said that such product has meant its need or target. This makes delivery mode imperative.

2.0 **OBJECTIVES**

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

- Select an appropriate multimedia delivery mode
- Create a good multimedia delivery mode

3.0 **MAIN CONTENT**

The delivery of the learning content is very important, especially when it is for self-learning. We need to consider the ways through which multimedia can be deployed effectively in a particular teaching-learning environment for effective self-learning. In order to decide the most useful delivery option, we need to take some systematic steps, and also have to understand the unique features of each of the options available to us.

In this section, we will discuss all about the multimedia delivery options available to us, and how we could decide about the options that suit our requirements.

Delivery Options for Multimedia

Multimedia lessons can be delivered in multiple ways, including through stand-alone CD-ROM. With the fast development of Internet and its bandwidth, it is also possible to place multimedia lessons on the World Wide Web as a part of an e-Learning programme. Another option still available and used most effectively is as supplement or complement to the printed lessons. Thus we have two basic approaches to deliver multimedia lessons -- independent approach and Blended-approach. Independent approach has two different modes – web delivery and CD-delivery. The blended approach has two strategies – Supplementary and Complementary. Let us see each of these delivery options available to us.

CD-Based delivery of Content

The CD-ROM drive has become a standard component of computers these days, and therefore it is one of the best options available. Moreover, the sizes of multimedia lessons are normally big, and the high-density storage capacity of the CD suits the technical requirements. How much a normal CD can hold is given the box.

Web-Based Delivery of Content

Since multimedia files are normally very big in size, they are not recommended for web-based delivery because of the poor bandwidth at the user's end. However, with the emergence of Shockwave, the delivery of multimedia on the web has become

easier. Still you can't expect a multimedia to be downloaded as quickly as it runs from a CD. Shockwave is a standard format for displaying media element. It is also an extension or plug-in for the browser. Essentially, it is a compression technique that allows you to play Director, Flash or Authorware files over the net. However, if you plan to deliver multimedia over the net, you need to do the following:

- Minimize the number of cast members
- Use low- resolution images and sound
- Use images that can be compressed
- Do not use loops continuously.

Blended Delivery Strategy

A blended strategy means that you can mix different delivery media in to a package. For example a self-learning programme can be delivered in a package of content in print, multimedia CD and the Web versions. In a supplementary strategy, the multimedia CD or Web version becomes supplement to the print version of learning materials. This strategy is useful, if there is a need to strengthen the learning process by providing multiple points of view. On the other hand, a complementary strategy defines the limits of print medium to some areas of the content and the others for multimedia delivery. In this way both the media approaches become complementary to each other, forming an integrated approach.

Analyzing the Delivery Media

The factors that determine how you want to deliver your multimedia package are related to the reach, and to the inherent characteristics of each medium. The choice of using multimedia for delivery of a lesson is an important decision that needs to be taken very carefully at the beginning. Once it is decided that a particular content area is good for delivery through multimedia, it is important to consider how to reach the target learner. At this stage we need to consider the learner's access to the Internet and computing facilities. In most of the developing countries, where the cost of Internet access is still on the higher side, the CD-based delivery of multimedia would be the better option.

In the next section we will discuss how we can evaluate multimedia lessons, and various approaches to evaluation.

(Adopted from Commonwealth Educational Media Centre for Asia. Educational Multimedia: A Handbook for Teacher-Developers 2003)

SELF ASSESSMENT EXERCISES

1. List the different delivery mode used in multimedia
2. State the advantages of a good delivery mode

Answers: Form a group of five persons and discuss your answers using the text.

4.0 CONCLUSION

To choose an adequate delivery mode, there are certain criteria to be considered. Such criteria as the social and physical constraints of the learners; availability of the necessary equipment and cost of production.

5.0 SUMMARY

This unit discussed the different delivery modes that are available in multimedia for teaching and learning. Multimedia can be delivered through CD-based, Web-based and blended delivery. The teacher is in the right position to determine what delivery mode to use for the learner by working with the set objectives in line with the availability of needed equipment.

6.0 TUTOR MARKED ASSIGNMENT

1. Carefully analyse multimedia delivery mode in teaching and learning.

2. Write short notes on:
   a. CD-based
   b. Web-based
   c. Blended Delivery Strategy

7.0 REFERENCES/FURTHER READINGS

The Commonwealth of Learning – Commonwealth Educational Media Centre for Asia (2003). Educational Multimedia: A Handbook for Teacher Developers Version 1.1

UNIT 5 PROBLEMS AND SOLUTION IN MULTIMEDIA

CONTENT

1.0 **INTRODUCTION**

As much as the use of multimedia has been found useful in teaching and learning; there are some problems associates with the usage. To achieve the maximum advantage one should not loose sight of these problems and possibly look for a way of solving the problems. This unit would discuss these problems and also proffer solutions to the problems.

2.0 **OBJECTIVES**

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

- Identify the problems associated with multimedia in teaching and learning.
- Explain the possible solutions in solving multimedia problems
- Adequately apply the solutions in solving multimedia problems

3.0 **MAIN CONTENT**

3.1 PROBLEMS IN MULTIMEDIA

Multimedia production faces some problems especially during production. Some of these problems negate the academic procedure in multimedia production because most productions are carried out by non academic company for commercial purpose. Other constraints are imposed on the process of making multimedia for instruction by non professionals, usually at the policy level. They are broad in scope and are seldom defined in depth.

The following are some of such problems:

- **Lack of proper procedures and documentation**. In multimedia production, there are procedures to be followed if one is to attain the desired purpose. These procedures have some criteria to be considered like setting of behavioural objectives. Also there is no proper outlining of what should be done or how it should be done.

- **Poor Scripting**. It has also be observed that the method of scripting does not allow for pure academic scrutiny.

- **Lack of Clear Roles and Responsibilities**. There are conflict of roles and responsibilities in the design structure; which causes problem during production.

- **Inappropriate Feasibility Studies**. It has been observed that sometimes the software produced does not exactly meet the need of the users. This is because; an appropriate situation analysis was not carried out before embarking on production, therefore leads to distortion or deviation from the need of the users.

- **Lack of Quality Control**. One way to assure quality is by having several tests on the product. But most times, production is commercial and therefore, does not give much attention to sufficient testing before sending them out for use; which then create lack on corrections that would have been effected before final use.

- **Deviation From the Actual Design**. During production, producers sometimes deviate from the actual design. This have great effect on the objectives which have been drawn and on the long run may not meet the need of the users.

SELF ASSESSMENT EXERCISES

Question: List the problems associated with the use of multimedia.

Answer: Compare your answers with those stated in the text

.

3.2 SOLUTIONS TO THE PROBLEMS

There are no problems without solution. As well as we have known there are problems, some scholars have worked on how these problems could be solved or minimised.

Barker and Giller suggest that when the following procedures are adopted in multimedia production, there will be more positive results than when it is solely left in the hands of the commercials.

- **Project Life Cycle**. Divided into two major parts – Interactive Process and Dissemination. The interactive process includes the preparation, design and development phases. At this phase, there is an interaction among the phases; the interaction depends upon the values of time and cost variables for a project. The fourth phase, which is dissemination, can be repeated but not in an interactive nature except when the product need to be revised or modified in some way between releases.

- **Analysis of Requirements**. Multimedia learning products are relatively new in teaching and learning, and not many clients know the advantages and disadvantages of the method of instruction which have an impact on the end-product. It is important to state all the benefits as well as the non-benefits of the intended products before going into production, this helps to assure quality at the end of production.

- **Design Specification**. "A design specification is a referral document that provides a detailed description of the program requirements. It incorporates essential information such as the font sizes to be used, the colour palettes, file formats and flow charts outlining the proposed content. This document should be available to all members of the development team."

- **Resource Production**. Multimedia products are made up of a series of 'pages' containing text, graphics, audio, video and animation. The establishment of appropriate parameters for each of these at the outset of the project avoids inconsistencies within the final product.

- **Delivery Medium**. There are different medium of delivery multimedia products – CD-ROM, Internet or Local network. Each of the delivery modes has its own merit and demerit, which need to be known before choosing a medium for delivery. The merit and demerit has to be considered in line with the need for which the product is produced.

- **Program Integration**. Integration takes place when all the individual multimedia elements are complete. All the elements are integrated into one product, which is the final product. A proper integration can only be achieved through the availability of a comprehensive script and detailed flowcharts to assist the

programmers and resource producers. In addition, it is essential to have a good file naming strategy in order to avoid chaos when integrating resource files into the final program.

- **Human-Computer Interface (HCI)**. This include human controlled interface of the computer, such as the screen layouts, navigation controls, user interaction and the various metaphors that are embedded within the courseware.

- **Quality Control and Evaluation**. Ideally, testing and quality control should occur at all stages of the development process. Testing should not be kept until the end of production, so as to allow corrections to be effected. Both formative and summative evaluation strategies must be identified during the planning stage. It is important to stress that evaluation and product testing should be regarded as continuous processes both during and after the development of a product.

- **Documentation**. It is important to have good documentation of a project life cycle, this include the project proposal, design specifications, scripts and storyboards, quality control and testing strategies, and progress reports.

- **Dissemination**. This stage involves all the processes necessary to package the product and make it available to customers.

SELF ASSESSMENT EXERCISES

Question: 1. State solutions that could help alleviate the problems associated with multimedia.

2. Group yourselves into five and:

a. Try to identify other problems different from the one stated in the text.

b. Proffer solutions to these problems

Answers: 1. Cross check your answers with the one stated in the text.

2a. & b Pilot test your suggestions and draw your final conclusions based on the findings.

4.0 CONCLUSION

The teacher should not loose sight of the problems connected with the use of multimedia. In the process of production, evaluation should be continuous to help detect and proffer solutions to the detected problems. One should not wait until the production process is completed. Also evaluation should be continuous during implementation. This is important because there are some problems that could be detected during this stage. Though it may not be easy to make quick amends but such amends could be done during review.

5.0 SUMMARY

From researches and observations it has been discovered that most educational multimedia courseware are faced with the following problems – poor scripting, lack of proper documentation, lack of clear roles and responsibilities, inappropriate feasibility studies and lack of quality control. Some others are true constraints arise from ambiguity, uncertainty and sometimes lack of criteria for knowing the limits of mediocrity and the excellence of success. To alleviate these problems the following solutions were proffered – to have a good plan of project life cycle, analysis of requirements, design specification, consider a good delivery mode and good resource production.

6.0 TUTOR MARKED ASSIGNMENT

1. a. Critically examine the problems faced with the use of multimedia for teaching and learning.

   b. How would you proffer solutions to those problems?

7.0 REFERENCES/FURTHER READINGS

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MODULE 3

EVALUATION OF MULTIMEDIA

INTRODUCTION

Evaluation is the only process by which we can ascertain if a particular multimedia product was fully utilised or not when evaluation is properly carried out. In this module, evaluation would be discussed in detail under the following units:

Unit 1 Meaning and Importance of Evaluation
Unit 2 Types of Evaluation
Unit 3 Issues in Evaluation
Unit 4 Developmental Testing or Alpha and Beta Testing
Unit 5 Evaluation as Continuous Process of Quality Improvement

UNIT 1 MEANING AND IMPORTANCE OF EVALUATION

CONTENT

1.0 INTRODUCTION

In this unit you would be taught the meaning and importance of evaluation. A careful study of this unit would enable you understand the depth of evaluation.

2.0 OBJECTIVES

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

- Define Evaluation
- State the importance of evaluation
- Carry out at least simple evaluation on multimedia products

3.0 MAIN CONTENT

MEANING

Like in every other aspect of teaching and learning, multimedia in teaching and learning also requires evaluation. It is only through this means it could be known if the purpose of the multimedia was achieved. This calls for the assessment of the software from production to utilization stage. There are different ways this could be done. The types of objectives set are determinants of the type of evaluation that would be required. This would be discussed later.

"Evaluation is testing whether a multimedia programme fulfils the objectives set, and suggesting improvements it requires to make the programme useful for its target audience". "Evaluation involve testing of the content it transacts vis-à-vis the target learners, keeping in view the prime objective of the expected learning which may take place in the learners after they go through the programme" (COL 2003).

Normally, evaluation of programme should be done at two levels – at the level of content and at the level of technology employed. Technology plays the role of only the means to attain the identified objectives. Optimal use of technology is desirable and in evaluating multimedia software it needs to be kept in mind that the technology itself should not become too cumbersome for the users, because the competence level of individuals using technology varies a lot.

IMPORTANCE

- **Understanding Learning and Learner**. Every learner has his/her own way of learning. There is a variation in the pace, timing and habits. These variations are taken care of by the computer, given opportunity to individuals to learn at their own pace and need. So while developing multimedia software, it should be paramount in our minds that learners should be able to interact in with the programme with ease. The suitability of this can only be verified through evaluation. A major tenet of multimedia education is the acceptance of the fact that no single method or medium is appropriate and perfect for all individuals. Every individual has his/her own preferred methods of information reception and processing.

SELF ASSESSMENT EXERCISES

From the definition given in the text, identify the main words in the definition and discuss them in a group of five.

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4.0 CONCLUSION

The importance of Evaluation cannot be over emphasized. Evaluation is the only means through which lapses can be discovered in a programme or process. Any programme or process without evaluation cannot grow or meet societal needs and standard. It is always important you know the outcome of a programme or process you are involved in, through which you would be able to find areas of improvement.

5.0 SUMMARY

Evaluation has been defined in different ways by different people. But what is most pertinent is that a good evaluation view the multimedia to ascertain if it meant with the purpose for which it was made, and if not 'why' and 'how' can it be remedy. Evaluation process should always be in the subconscious mind of the teacher when planning a multimedia class.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

Using your own words, define Evaluation.

7.0 REFERENCES/FURTHER READINGS

The Commonwealth of Learning – Commonwealth Educational Media Centre for Asia (2003). Educational Multimedia: A Handbook for Teacher Developers Version 1.1

UNIT 2 TYPES OF EVALUATION

CONTENT

1.0 INTRODUCTION

In the last unit the definition of Evaluation was given telling us that Evaluation is testing whether a multimedia programme has been fulfilled. Now that you know what Evaluation is, it is equally important you know how Evaluation is carried out. This unit would discuss the major ways Evaluation could be achieved in a programme. Such Evaluative process is contrived for both general and specific purposes that can be used for value judgement.

For the purpose of this course, we are going to adopt a write up from CEMCA & COL 2003.

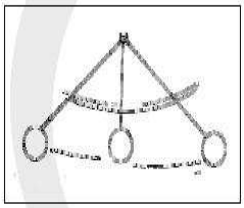
2.0 OBJECTIVES

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

- Describe both formative and summative evaluation of multimedia;

3.0 Main Content

There are certain decisions, which need to be taken before starting the process of software development. These decisions guide the process of software development. In fact these decisions become the guiding principles and the software developers have to keep asking the questions, if they are fulfilling the objectives decided upon in the planning process. Once the prototype of the software is ready, it is tested and once again the objectives can be re-examined and reformulated on the basis of feedback and evaluation. Evaluation is basically of two types: formative and summative. We shall discuss them below:



Formative Evaluation

Formative evaluation is done as a continuous process in the development of multimedia and even before the development process actually starts. Decisions taken at the beginning of the process of software development affect various aspects of the software. Answers to questions like who, why, where, and how become the guidelines for the development of the software. Depending upon the time and resources, both quantitative and qualitative methods of feedback are utilized in formative evaluation. No programme can fulfill all requirements of all learners. In fact, if a single programme can provide all the information, and answer all queries on a single topic, it should be considered successful. So, every software developer must decide and delimit the scope of the software beforehand. In other words, we have to spell out the objectives of the programme. Some questions like the following ones need to be answered because these will affect the content and the selection of technology.

(i) Who are the target users of this software and what is the level of the target users?

(ii) What is the level of computer familiarity expected of the learners?

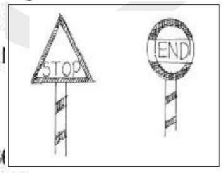
(iii) What would be the objective (in terms of content) to be covered by the programme?

(iv) How will the programme be used?

   a. as supplementary to classroom teaching?

   b. as independent programme providing complete courseware?

Once decisions on the above are made, the cognitive aspects of learning are to be considered. The socio-cultural background of the target users will affect content selection and treatment of the topic. In arranging the content, the learning habits of the users would influence the decision about sequencing of information, quality information (through various media) provided through every screen, a supplementary information to be provided through links.



It is often mentioned that no programme should aspire to be complete or s sufficient, but it should lead the users to relevant information. The software developer should provide relevant links and the content expert should word the text and place other relevant media material in a manner that they raise more inquisitiveness in the learners and they go for further search and self study.

Summative Evaluation

After the completion of the development of the programme, the software is released for use. The actual users, then, make suggestions and these suggestions form the basis of summative evaluation. Summative evaluation is the end of the project evaluation. Some programmes involve a number of teams to develop various components of larger software, which finally integrate into the end product. While working with Microsoft Office you must have used the numerous facilities it offers. For example if you click on the Accessories it provides Calculator, Games, etc. These must have been developed by different groups separately and then finally joined to make a final product. Summative evaluation, as mentioned earlier, should be conducted for each of the components and also for the final product.

As summative evaluation is targeted at the end-users, in educational software a major focus of study is the software's *pedagogic effectiveness*. The teaching-learning objectives identified during the needs analysis become the base of summative evaluation of academic software. Evaluation should keep the educational, entertainment, ease of use or design features in mind while conducting summative evaluation of these and then overall impact on learning.

Suggestions on the basis of summative evaluation may be for (i) short-term and (ii) long-term changes in the programme. Short-term changes may be based on your own observations and the feedback from the users and the long-term changes may be made on the basis of the decisions of the curricular design and on the basis of suggestions given by the development agencies and the organisations using your software, if it is being used outside your institution.

SELF ASSESSMENT EXERCISES

Choose a partner and make a role play of Formative and Summative Evaluation, stating your roles and when such roles are found useful during evaluation.

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4.0 CONCLUSION

Evaluation is a continuous process which must be carried out at each stage of a programme. It is therefore important for the teacher to consider the mode of evaluation at each stage of multimedia programme. A good Multimedia Evaluation would help improve its success.

5.0 SUMMARY

There are two types of Evaluation – Formative and Summative. Formative Evaluation is done during developmental process and even before the development starts while Summative Evaluation is carried out at the end of project evaluation. Both should be conducted at each stage of the project.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

Critically examine the mode of evaluation in multimedia.

7.0 REFERENCES/FURTHER READINGS

The Commonwealth of Learning – Commonwealth Educational Media Centre for Asia (2003). Educational Multimedia: A Handbook for Teacher Developers Version 1.1

UNIT 3 ISSUES IN EVALUATION

CONTENT

1.0 INTRODUCTION

In the first two units of this module, you have been taught the meaning, importance and types of evaluation. Apart from these there are other pertinent issues that need to be discussed. These issues are vital in the production and utilisation of multimedia products therefore, these issues would be discussed in this unit.

2.0 OBJECTIVES

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

- Examine different issues in multimedia

3.0 MAIN CONTENT

Development of educational multimedia can be viewed at two levels: 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 realization of conceptual framework into a multimedia programme, 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 as many of the facilities like screen layout, color schemes and the detailed use of individual media like the moving pictures, audio, text etc. The objective of the whole effort should be to integrate elements of multimedia into a deep learning architecture.

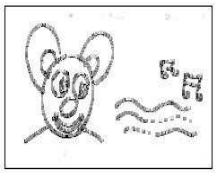
Although the design of interactive multimedia material should be consistent with theories of both learning and teaching (already discussed in Section 4) there is a wide range of opinions on what constitutes 'good' interactive learning material, and consequently there is room for subjective judgment and for creativity and innovation. Rather than taking a prescriptive approach to design content, presentation and interaction, we consider the issues involved. There are four basic issues namely (i) educational effectiveness (ii) entertainment value (iii) user friendliness of technology and (iv) design features, which must be taken care of while designing multimedia software.

Educational Effectiveness

You would agree that the goal of all educational programmes is to have high academic or pedagogic value. Some of the questions that should be asked are:

- Will the software meet the educational objectives 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?
- Is the content presented in simple and neutral of gender, without ethnic and religious biases?
- Does the software offer simple, precise directions accompanied by picture choices and voice responds to the learner's own rate of learning?
- Are there sound policies to back up the philosophies of using media techniques for educational effectiveness?

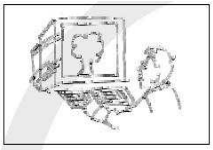
Entertainment Value



One of the major objectives of teaching through multimedia programme is to provide edutainment to the learner. And, also the main reason why multimedia is popular is its capacity to enable learning without slogging. As you design your software, you must be careful and see that the programme offers learning opportunities in a 'fun-learn' environment. Ask yourself the following questions to satisfy yourself whether your programme fulfills the criteria:

- Does the programme (in sound and graphics) provide learning in an enjoyable environment to the target learners?
- Does the programme provide adequate flexibility to 'surf' i.e. move around and learn at one's own pace and convenience?

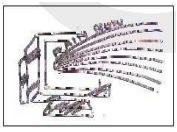
User Friendliness of Technology



In teaching-learning activities dependent on technology, the main hurdle faced by the participants is the lack of or limited familiarity with the technology. It should be our 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 programme within reasonable time and independently use it after the first use. We may ask the following questions to test, if our programme provides the ease of use:

- Is the selected platform commonly available and easy to use?
- Can the learners review the sections they have read/viewed and take a test on these?
- Can learners print/save desired information?
- Can 'last action' be cancelled?
- Is the space large enough to accommodate the viewer, who is at same measurable distance?

Design Features



Let us be aware and conscious that we use facilities not because they are available but because they are essentially required for communicating the concept. For example, most softwares these days provide the facility to include moving objects and sound. These can be used for conveying information but such technologies are viewed by some as distractions which may be dispensed with. However, we can find concepts and information for which these features may be crucially required.

- Are the pages pleasing to eyes and also contain no items which may offend any user?
- Does the design have icon-based features?
- Can sound and video be played smoothly and adjusted or muted at will?

SELF ASSESSMENT EXERCISES

In a group of five, assess a multimedia product using these issues.

4.0 CONCLUSION

It is vital that a teacher considers these issues raised if he/she is to succeed in the use of multimedia for teaching. Also these issues should be connected with the objectives set.

5.0 SUMMARY

There are some major issues that cannot be over looked in production and utilisation of multimedia. Such issues as educational effectiveness, entertainment value, user friendliness of technology and the design features of the multimedia product. These issues must be considered during the production stage so as to meet the desired goal.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

Explain the procedure that could be taken to ascertain quality control of educational multimedia products.

7.0 REFERENCES/FURTHER READINGS

The Commonwealth of Learning – Commonwealth Educational Media Centre for Asia (2003). Educational Multimedia: A Handbook for Teacher Developers Version 1.1

UNIT 4 DEVELOPMENTAL TESTING OR ALPHA AND BETA TESTING

CONTENT

1.0 INTRODUCTION

In every discipline there are peculiarities in which multimedia is one.
There are some kinds of testing which are peculiar to multimedia software developers. These peculiarities would be discussed in this unit.

2.0 OBJECTIVES

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

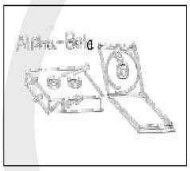
- Analyse the different types of testing in software development.

3.0 MAIN CONTENT

Unlike the terms 'formative' and 'summative' evaluation, which are borrowed from the educational research, the terms commonly used by software developers are 'Alpha testing' and 'Beta testing'. These are frequently used terms with standardized procedure and meaning. Also, there is no 'wrong way' of using a software and the testers/users should be left to use it in the manner they find most suitable. During the testing procedure we may try to track the most favorite or natural way of browsing followed by the users. Anything that they may be doing 'incorrectly' would help us identify areas which need redesigning. We shall explain what these terms denote in the process of software development.

Alpha testing

Alpha testing is conducted when the prototype of the software is ready and the software can take inputs and generate outputs. At this stage the software is not fully functional and so the software is normally not sent to the end users but tested inside the organization, in our context, on the peer group. The software is run on a different machine within the organization so that, if there are some bugs, they can be detected and eliminated. The software is tested for aspects like *navigation*, look, and *feel* of the software. Alpha test informs us about the tools that worked and tools that did not work. We get the perspective of the content experts and the designers (in this case both may be you) and the learners.



Alpha testing becomes particularly relevant when a number of developers are involved in developing various modules and when these are integrated; it becomes important that they work in conjunction. Sometimes, various modules developed by various developers do not integrate. In developing software single handed the objective of alpha testing should be to find if text, voice, picture etc. integrate well and pop-up as and when desired, and do not interfere with learning.

Beta testing

It is very important to eliminate defects as soon as they are detected. However, it is always boring to eliminate defects and developers often enjoy adding new features. The proverb 'a mend in time saves nine' is never more true than in this case. Every time problem elimination is postponed, the problem is slightly increased because it would not be fresh in mind the next time. Precisely, the functional specifications and the source code are reviewed at the earliest with the objective of eliminating defects before they start to waste cycles.

The software is sent to people outside the organisation or end-user for their review. Outside reviewers will be able to reflect on the requirement of the software at this point and make relevant suggestions. At this stage testing for software reliability, installation and documentation are done as well.

SELF ASSESSMENT EXERCISES

In a group of five, assess a multimedia product on the type of developmental testing used.

4.0 CONCLUSION

So far you have been taught the two major of software testing which is Alpha and Beta Testing. You should read through your test once more if you do not fully understand and make sure you note the misconception of the two tests.

5.0 SUMMARY

There are two major types of software testing – Alpha and Beta Testing. Alpha testing is very relevant when a number of developers are involved in developing various modules which are integrated while Beta testing is very important for eliminating defect as soon as they are detected. Developers are usually happy to add new ideas. Both testing are useful to the developers.

6.0 TUTOR MARKED ASSIGNMENT (TMA)

As an educational technologist, advise commercial developers on the use of software testing.

7.0 REFERENCES/FURTHER READINGS

The Commonwealth of Learning – Commonwealth Educational Media Centre for Asia (2003). Educational Multimedia: A Handbook for Teacher Developers Version 1.1

UNIT 5 EVALUATION AS CONTINUOUS PROCESS OF QUALITY IMPROVEMENT

CONTENT

1.0 INTRODUCTION

In the last unit, it was mentioned that Evaluation is a continuous process. It is not only a continuous process but serve a vital role in assuring the quality in multimedia. This unit would therefore discuss extensively on how Evaluation can assure quality control.

2.0 OBJECTIVES

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

- Use appropriate evaluation methods and techniques;
- Build a case for continuous evaluation for product improvement;
- Undertake evaluation of prototype lessons.

3.0 MAIN CONTENT

Evaluation of multimedia software cannot be and should not be a terminal or one-time activity. It has to be an on-going and continuous process. As new information get generated and demand for information is made, provision for incorporating new information may be a condition for evaluating a multimedia software. Multimedia software, which is rated highly today, may be rated poorly after only a few months, if it is not continuously updated. This would be particularly true in the case of growing disciplines.

Developments in technology is also an important issue. As a new technology comes up and people start using it, any programme not providing such a facility would not be appreciated. To keep a programme floating and popular new options and facilities need to be incorporated. Sometimes, some of the basic design concepts and the architecture of these older programmes may well appear to have been superceded by recent developments. Users who may be familiar with the features that are being replaced, and so, replacing them may demand users to learn new features and unlearn the old ones. New features do not always result in improved functionality. For the sake of simplicity and elegance of design, older features could be resuscitated.

For the above reasons multimedia software needs to be update at short intervals with the help of content experts and software engineers.

It is said 'practice brings perfection' and this is entirely true of multimedia development. In this section, we have mentioned under different sub-sections the various issues in software evaluation, including formative evaluation, summative evaluation, beta testing, alpha testing and the need for continuous improvement in multimedia development.

A suggestive instrument for evaluation for Multimedia

Questions	Very useful	Useful	Not useful
Did you find the information that you wanted?			
Do you think the time spent in processing the information was worth it?			
How useful is the programme for learners using it in isolation?			
How useful is the programme for group learning?			
How easy was the use of the programme after the first demonstration session?			
Did the programme provide helpful on-line information when required?			
Were navigation tools provided through menus and icons readily available?			
How easy was it to cancel the last move?			
How easy was it to 'fly' or print or save selected items?			

SELF ASSESSMENT EXERCISES

Question: How would you improve on educational multimedia?

Answer: Cross check your answers from the text.

4.0 CONCLUSION

Evaluation should not wait till the end of programme. But should be done often so as to be able to detect the defects and adjust to meet the needs and demands of the learners and the general society.

5.0 SUMMARY

Evaluation of multimedia software does not only arise as a result of defect detected but also as a result of change in technology, which may call for a change in the general setting. This often times affect the users because there will be the need of training them on how to use the incorporated skills. This is why is sometimes said that a multimedia software that is highly rated today may be poorly rated tomorrow if it fails to update.

6.0 TUTOR MARKED ASSIGNMENT

1. Explain why it is necessary to continually carry out an update on multimedia software?

3. How would you use evaluation to enhance quality control?

7.0 REFERENCES/FURTHER READINGS

The Commonwealth of Learning – Commonwealth Educational Media Centre for Asia (2003). Educational Multimedia: A Handbook for Teacher Developers Version 1.1