UNIT 11 DEVELOPMENT OF CONTENT FOR VARIOUS MEDIA

Structure

11.1 Introduction

11.2 Objectives

11.3 Forms of Textual Content

- 11.3.1 Self-learning Material (SLM)
- 11.3.2 E-text and Web Page
- 11.3.3 Interactive Text

11.4 Process of Text Development

- 11.4.1 Writing Objectives
- 11.4.2 Content Development

11.5 Editing the Text

- 11.5.1 Content Editing
- 11.5.2 Language Editing
- 11.5.3 Copy Editing
- 11.5.4 Format Editing

11.6 Development of Audio and Video Resources

- 11.6.1 Planning of the Programme
- 11.6.2 Script Writing
- 11.6.3 Development of the Programme

11.7 ICT Tools for Development of Audio and Video Resources

- 11.7.1 Screencast
- 11.7.2 Audio-Video Streaming
- 11.7.3 Video Editing
- 11.7.4 Audio-recording and Editing
- 11.7.5 Podcast

11.8 Let Us Sum Up

11.9 Unit End Activities

11.10 References and Suggested Readings

11.11 Answers to Check Your Progress

11.1 INTRODUCTION

In Unit 10, we have discussed the popular instructional and learning designs that are to be followed while developing the instructional materials. In this Unit, the focus will be on giving you an idea of different forms of content (or teaching-learning materials). Along with that, the process and tools for developing the content will also be discussed. The Unit will start with a discussion of various forms of textual content like self-learning material (SLM), e-text, interactive text, etc. The Unit will also discuss basic steps of content development that include the formulation of objectives,

development of the content, and types of editing (content, format, language, and copy editing). Along with that various steps of developing audio/video content like content planning, script writing, and storyboard will also be discussed in brief. At the end, the Unit will throw light upon various open-source and proprietary software and ICT tools for developing screencast video, streaming, and recording, video editing, audio recording, and editing, etc.

11.2 OBJECTIVES

After going through this Unit, you should be able to:

- explain and develop various forms of the textual content,
- write instructional objectives for the content to be developed,
- explain the importance and use of various types of editing of the material,
- develop script and storyboard for audio and video resources, and
- use various ICT tools to develop and edit audio and video resources.

11.3 FORMS OF TEXTUAL CONTENT

There was a time when textual content means the printed form of texts like textbooks and reference books and so on. With the emergence of the Open and Distance Learning (ODL) System, learner-centric instructional materials in form of Self-Learning Material (SLM) have started coming up. You have already studied the concept and characteristics of SLMs in Unit 10. The SLM was mostly developed in print form (hard copy). With the increased penetration of technology and access to digital devices, nowadays printed SLM is available in electronic form (soft copy) like electronic texts (e-texts), web pages, word files, portable document format (PDF) files, interactive e-texts, etc. Now you have the freedom to select between the print (hard copy) and e-text (soft copy), with which you want to learn. The educational institutions have also started giving options to learners to choose the form of text-material that is printed or e-version. Say for instance any learner taking admission in IGNOU can choose printed or e-text form of Self-Learning Material (SLM). You might have also seen that learning materials in e-form are available at various platforms like websites, e-content repositories, mobile apps, Massive Open Online Courses (MOOCs) platforms, Learning Management Systems (LMSs) and so on. This has given ral flexibility to learners in terms of access to the material.

In the above paragraph, we have briefly mentioned that nowadays textual content is available in various forms. They are Self -Learning Material (SLM), e-text, web page, interactive text, etc. Let us discuss each one of them.

11.3.1 Self-Learning Material (SLM)

Just think about the reading material you are studying. The material that is provided to you is the printed form (hard copy) of SLM. You may recall Section 10.6 of Unit 10 where we have discussed the concept and

characteristics of SLM and differentiated it from the textbook. What makes SLM different from the other text material? If you compare any textbook with the SLM, you will find that SLM has been exclusively developed to facilitate your learning without the help of a teacher. It is often said that *SLMs are different from other learning materials because they can make a learner think, write and do***.** The various roles of a teacher that is guiding, explaining, motivating, provoking through questions, repeating, reminding the points, monitoring the progress of learning, etc., are incorporated in the SLM. Therefore, we can say that a teacher is inherently built into the SLMs. Therefore, while reading the SLM, it feels like a teacher is interacting with you. SLMs, help you learn the subject matter on your own.

Do you have any idea about the structure of SLM? In general, the SLM of any course is organized into a structure consisting **blocks** and **units**. Say for instance in this course that is BESE 106, there are four blocks. In each block, you will find 3 to 5 units. The blocks and units of an SLM can be prepared in different ways. Say, for instance, it can be a separate block-wise booklet with 3-5 units or a single booklet consisting all blocks and units. For example, the SLM of this course that is BESE 106 is prepared as a single booklet. The number of blocks and units in a course is decided by keeping in mind the credits assigned to the course, curriculum, content load, level of learners, etc. For example, you may find 12-16 units in a SLM of a 4 or 6 credits course whereas in some courses specifically practical in nature, only one workbook or activity guide can cater to the needs of a 1-2 credits course.

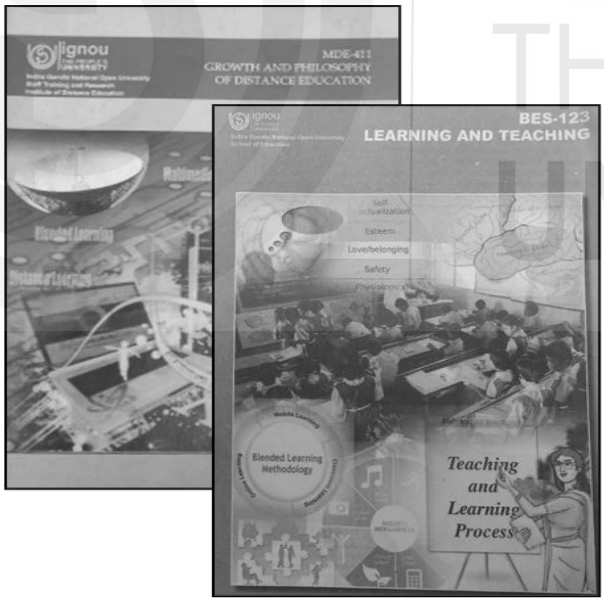


Fig.1: Sample SLMs

Let us move forward and discuss the components of SLM in detail. You need to understand the components of SLM. This will help you to develop high-quality SLM. The unit is the basic component of SLM. The unit facilitates learners to acquire knowledge related to their subject or theme/content. You will find that each unit of this course has followed a specific structure. The structure of a unit is divided into three main parts. They are the opening section, main body, and ending section.

i) **Opening Section:** The opening section gives an overview of the unit such as topics included, objectives of learning, etc. The opening section of a unit includes the following components:

- ***Title:*** Title is the core theme of the unit.
- ***Structure / Contents****:* Structure means the overview of the concepts and topics covered in the unit.
- ***Introduction****:* The introduction gives an overview of the topics that are going to be discussed in the unit. It helps learners to link their previous knowledge and past experiences to new topics. The introduction also provides a brief idea of the topics of the previous unit so that learners feel continuity while studying.
- ***Objectives****:* Each unit is prepared to achieve some objectives. The objectives means 'what is intended to achieve after studying a particular unit'. In the unit, objectives are written in behavioural terms. It helps learners to know what exactly they will achieve after studying that particular unit. Say for example, 'learners will be able to use ICT tools to develop video programmes' is an objective. If the unit has an objective of this nature, then the learners studying that unit will be able to develop video programmes using ICT tools.

ii) **Main Body:** The main body is the place where the subject contents/ topics (or learning point) are discussed. The subject contents are logically and systematically presented in an interactive style with examples, illustrations, case studies, etc. The main body of a unit includes the following components:

- ***Sections and sub-sections:*** The main learning points of the unit are organized sequentially under sections and subsections.
- ***Illustrations:*** The contents are presented in a learner-friendly and interactive manner. During the presentation of the contents, figures, graphs, images, tables, etc., are used at various places. The use of illustrations helps learners clearly understand the contents.
- ***Self-assessment questions (SAQs):*** In most of the units, every section (sometimes a sub-section too) ends with self-assessment questions (or check your progress) to facilitate learners in self-assessment of the knowledge gained in a particular section.
- ***Activities:*** In some units, suggested activities are also given that is expected to be completed by the learners. The activities provided in the unit helps learners to apply the knowledge in a real-life context.

iii) **End Section:** The end session of the unit is the summary of the unit. The end section of a unit includes the following components:

- ***Summary / Let us sum up:*** The summary will be provided in every unit. The summary helps learners to recapitulate important learning points. It reinforces learning and refreshes learners comprehension of the contents.

- ***Unit end activities/exercises:*** You will find some questions/ activities at the end of the unit that is based on the contents discussed in the unit. These exercises are mostly activity-oriented or reflective. Unit end exercises help ignite the minds of learners and facilitate them in developing higher-order thinking skills.
- ***Glossary / Keywords****:* In some units (specifically technical/ scientific), the glossary of the keyword/s with their explanation is also given to facilitate the learning.
- ***References and suggested readings****:* The units are developed by the unit writers who are subject experts in their field. The unit writer uses various reference materials to develop the content. Acknowledging and citing those references is necessary. Therefore, in every unit, the materials referred to by the unit writer will be included. Along with that, some additional learning materials will also be suggested to facilitate understanding of the contents discussed in the unit.
- ***Answers and Feedback to SAQs****:* To check the answers or give directions to find the answers of SAQs given at various places in the unit, hints/suggested answers will also be given.

From the above discussion, you might have understood the components of SLMs. Try to follow this structure when you are developing units or SLMs.

Now let us discuss some of the ways of effectively using SLMs. To use SLM effectively you need to carefully read all the sections of the unit. You should never skip any section. If you cannot read the entire unit in one sitting, try to read at least one section. You may see some blank space on every page of the unit. You may use those spaces to jot down important learning points, points for further clarification, or extra study. You may also see some question/s under 'check your progress/questions' or SAQs and blank space below it. You should attempt the check your progress/questions or SAQs. This helps you understand and reflect on your level of learning Later you may compare your answers with possible answers given at the end of the unit and if required re-read the content. Once the reading of a unit is complete, you should write answers to the questions or perform the activities given at the end under 'unit end activities/exercises'. To clarify your queries and doubts on any topic in the SLM, you should attend the 'counselling' sessions organized at the study centre and share them with the counsellors. You may also discuss them with your peers. You should make the best use of the material and supplement your reading with other available resources.

11.3.2 E-text and Web Page

You are aware that we have traditionally been using the hard copy form of the text materials. But due to advancements in the field of technology, text materials are available in electronic form (or soft copy). So, we can say that text materials are not only available in hard copy form but also in electronic form. E-texts and web pages are electronic forms of text materials. What do you mean by an e-text? E-text is an umbrella term for text in digital form. What is the meaning of a web page? A web page is a digital document available on the world wide web (WWW) and identified

by a unique Uniform Resource Locator (URL). The web pages are created using Hypertext Markup Language (HTML). HTML is the computer language for creating web pages. You can access e-texts and webpages from anywhere, anytime using digital devices like desktop computers, laptops, tablets, mobile phones, etc. Many educational institutions have developed electronic forms of their study materials. Say, for instance, the e-texts of SLMs of various programmes offered by IGNOU is available on its e-content repository 'e-Gyankosh'(Fig.2). At the same time, various digital learning resources developed by IGNOU are also available on e-Gyankosh.

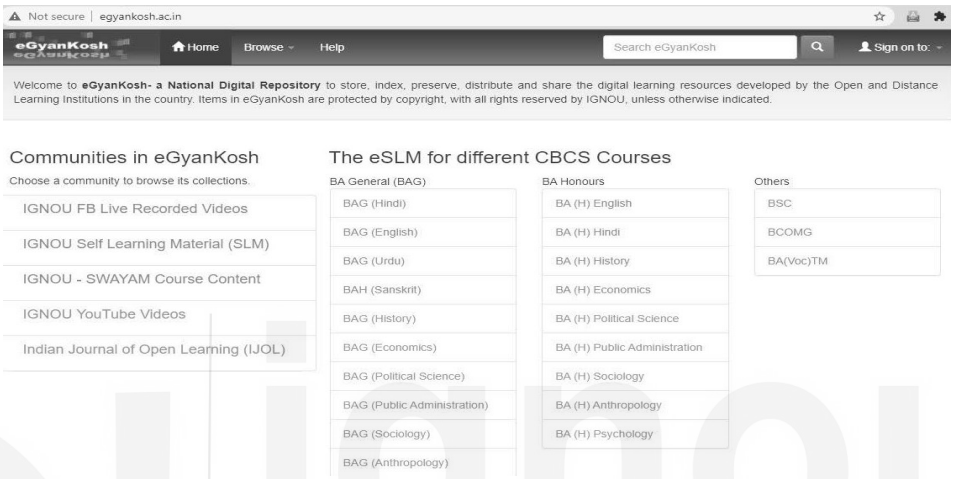


Fig.2: Home Page of e-Gyankosh

As mentioned above, web pages are digital documents available on the World Wide Web (www). The web pages are viewed on web browsers. You can also see web pages in online courses. Say, for instance, many MOOCs offered through SWAYAM provides text-based learning materials in webpage form. Fig.3 shows the web page form of text material.

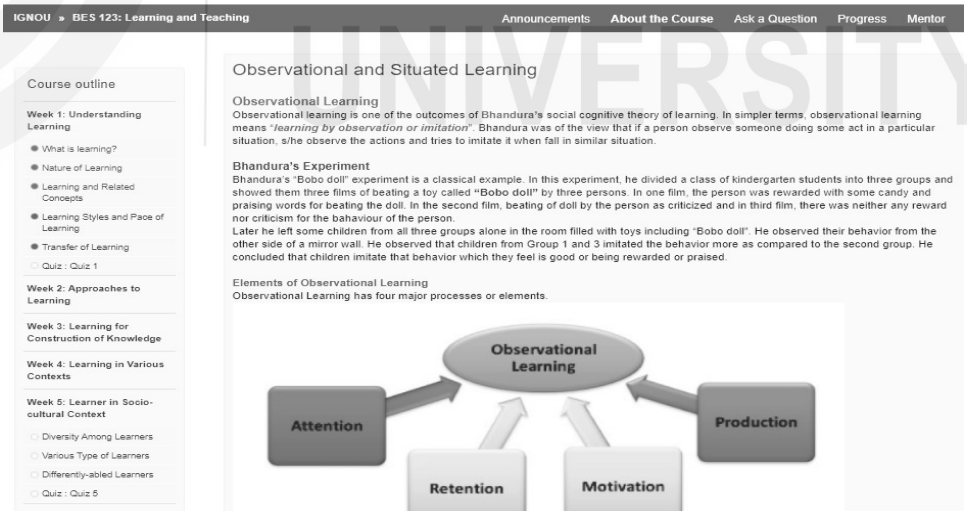


Fig.3: Text in Web Page Form

Nowadays, text materials can also be accessed through mobile apps and view them on mobile phones and other handheld devices. Say, for example, IGNOU has developed a mobile app named 'IGNOU e-content'(Fig.4). This app can be downloaded from the Google play store. The 'IGNOU e-content app', can be used to view, read and download the e-texts of various programmes offered by IGNOU.

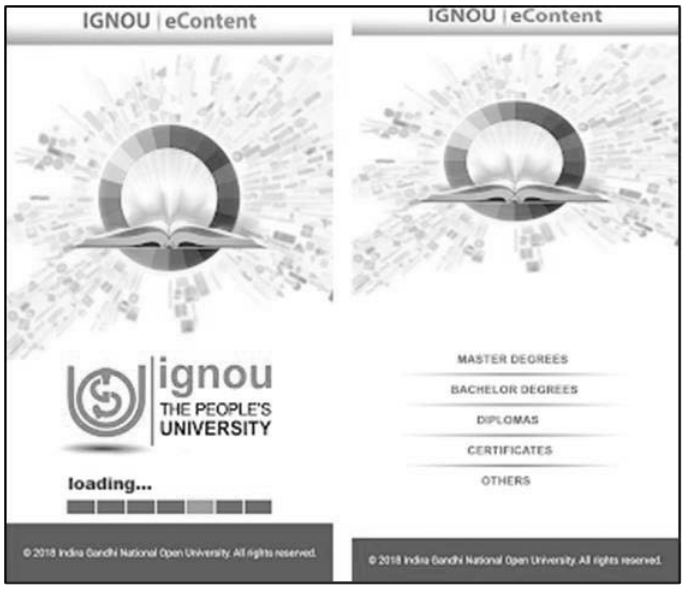
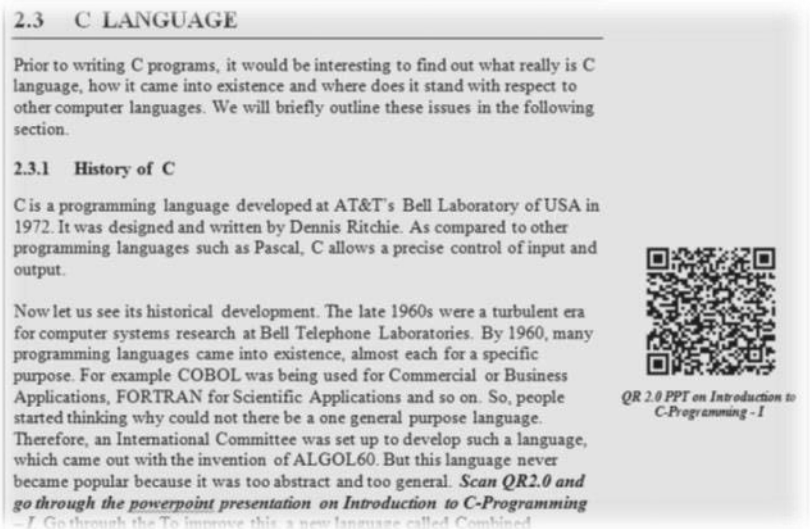


Fig.4: IGNOU e-Content App

11.3.3 Interactive Text

Before discussing the meaning of an interactive text, let us try to understand the concept of interactivity. What do you mean by interactivity? In the communication process, a sender sends information, which is received by receiver. If both sender and receiver sends information back and forth, such a communication is known as interactive communication. If the sender continuously sends information without allowing receiver respond, it is not an interactive communication. Now let us bring this idea to text materials. While reading a hard copy text material, you will only receive information. You cannot send information back to the text material. But in an e-text, you will get opportunity to interact. If there is a 'quiz' or 'test' in an e-text, you can attempt those questions and submit answers. So, you are receiving and sending back the information. Thus, text materials embedded with digital resources enabling users to send and receive information is called interactive text. The audio-video programmes, animations, web links, Quick Response codes (QR codes), quizzes, etc., are some of the digital resources that can be embedded in an e-text to make them interactive.

How interactive texts are created? In e-texts such as PDF, word, or web-page, you have to insert digital elements such as audio-video programmes, animations, presentation slides, games, pictures, graphics, hyperlinks, cross-references, weblinks, Quick Response codes (QR codes), quizzes, tests, etc., to make it interactive and engaging. The learner while reading the e-text can watch the video, listen to audio, attempt the test and so on. So, they are not just reading the e-text but responding in various ways. You may see Fig.5, wherein a QR code is embedded in the text. You have to scan the QR code to see the content embedded in it.



2.3 C LANGUAGE

Prior to writing C programs, it would be interesting to find out what really is C language, how it came into existence and where does it stand with respect to other computer languages. We will briefly outline these issues in the following section.

2.3.1 History of C

C is a programming language developed at AT&T's Bell Laboratory of USA in 1972. It was designed and written by Dennis Ritchie. As compared to other programming languages such as Pascal, C allows a precise control of input and output.

Now let us see its historical development. The late 1960s were a turbulent era for computer systems research at Bell Telephone Laboratories. By 1960, many programming languages came into existence, almost each for a specific purpose. For example COBOL was being used for Commercial or Business Applications, FORTRAN for Scientific Applications and so on. So, people started thinking why could not there be a one general purpose language. Therefore, an International Committee was set up to develop such a language, which came out with the invention of ALGOL60. But this language never became popular because it was too abstract and too general. ***Scan QR2.0 and go through the powerpoint presentation on Introduction to C-Programming*** – I. Go through the To improve this, a new language called Combined

QR 2.0 PPT on Introduction to C-Programming - I

Fig.5: Interactive Text

Check Your Progress 1

Note a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

1) Briefly discuss the important components in the 'end section' of a SLM unit.

……

……

……

……

Activity

1) Compare the SLMs developed by various open universities with reference to structure of the unit. You may visit the websites of the institutions to access the e-texts developed by them.

2) Select a topic of your choice and develop an e-text for the same. While developing the e-text embed figures, hyperlinks, and QR codes to it.

11.4 PROCESS OF TEXT DEVELOPMENT

The text-based learning materials are the commonly used instructional (learning) resources in ODL, online and blended learning systems. Text-based materials may be printed SLM, e-text, or interactive text. If you want to develop text-based material (or SLM/unit) for learning, you need to follow certain steps. The steps are writing objectives, content development and text editing. Let us discuss each one of them.

11.4.1 Writing Objectives

You are aware that distance learners learn subject matter mostly by reading the SLMs. Therefore, the units included in the SLMs must indicate their objectives (or instructional objectives). The objectives provide specific directions to the learners about what they will be able to do, understand and behave after completing the unit. Sometimes the term 'learning outcomes'

are also used in place of objectives. But technically learning outcomes are different from objectives. Objective refers to 'what the learners are intended to achieve through the learning material'. But learning outcomes means 'what learners will be able to exactly perform after learning'. The objectives define the scope of the content covered in the unit and the learning outcomes to be achieved. Therefore, every unit of SLM or e-text starts with objectives. Sometimes, you will also find objectives written before starting the sections/sub-sections. You may cross-check these statements with the different SLMs of this Programme.

What are the characteristics of instrutional objectives of text-based materials? According to Mager (1997), there are three important characteristics of an instructional objective. They are as follows:

i) Specific learning outcome **(performance)**

ii) Circumstances under which learning occurs **(condition),** and

iii) An element that specifies a level of proficiency **(criterion).**

Let us discuss each of these characteristics with the help of examples. For that let us consider an objective as given below:

Objective 1: Learners will be able to understand the phenomenon of heat.

Looking at this objective, what do you feel? What learners will learn and be able to do after completing the learning activity designed for teaching this objective? Will it be the concept or definition of heat or the effect of heat? Will it be the difference between hot and cold items? Looking at this objective, it is not easy to answer exactly what the learners will understand and how you will assess it. This is because the term "understand" lacks clarity and will not tell you what learners know.

From this, you should understand that terms that are not clearly stating "actions" (or behavioural terms) should be avoided while writing objectives. Because these action verbs invite different interpretations for different learners. Therefore, the terms like understand, know, appreciate, comprehend, learn, recognize, grasp the significance of, enjoy, believe, have faith in, and learn, etc., should be avoided while writing the objectives. Let's see the modified version of the same objective which is given below:

Objective 1A: Learners will be able to list hot and cold items based on their daily experiences.

You analyse this objective in the light of the three characteristics suggested by Mager. Then you will realise that this objective clearly states the *expected learning outcome/s* (first criterion), that is listing hot and cold items. This statement also gives hints about the circumstances (second criterion) 'daily experiences of the learners'. However, this objective lacks the third criterion 'element that specifies the level of proficiency' because one learner may list two items whereas the other five items. Therefore, this objective can be modified further as:

Objective 1B: Learners will be able to list the three hot and three cold items based on their daily experiences at home.

Now, this objective has refined the second criterion 'hinting at the circumstances' and included the third criterion 'element that specifies the level of proficiency' by asking to list three hot and cold items.

Now you might have understood how objectives are to be written. While writing objectives you might have also noticed that the action verbs (or behavioural terms) are used. Why is it so? You may be thinking that why there is so much emphasis on writing objectives in behavioural terms. The objectives are written in behavioural terms for the following reasons:

- They mention what the learners will achieve or perform after completing the unit.
- They help teachers to decide the scope of the learning content, activities, illustrations, examples, etc.
- They help teachers to reflect on the characteristics of learning experiences and assessment processes.
- They help to select appropriate questions for testing the learners performance at different levels.
- They enable learners to know what they must learn or achieve in a particular unit. This helps them plan the schedule or adopt strategies for learning.
- They help teachers to determine methods, techniques and strategies for teaching-learning processes.

Table 1 given below shows the list of some of the 'action verbs' that can be used while writing the objectives in behavioural terms.

Table 1: Action Verbs Used for Writing Objectives

Analyze	Describe	Explain	Translate	Write	Define
Demonstrate	Interpret	Predict	Construct	Create	Identify
Illustrate	Perform	Distinguish	Evaluate	Judge	Organize
Participate	Summarize	Justify	Produce	Order	Solve
Specify	Classify	Communicate	Modify	Review	Recite
Apply	Design	Support	Recognize	Volunteer	Name
Outline	Select	State	Generalize	Use	Diagnose
Separate	Categorize	Plan	Device	Appraise	Contrast

11.4.2 Content Development

After framing the objectives of the instructional material, you may start the development of the content. Content means the subject matter to be learned by the students. We have already discussed that the teacher is inbuilt in SLM. Therefore, while developing the content, you need to include the activities that are generally performed by a teacher in a traditional classroom. You should write the unit in an interactive style. The writing should be in such a way that, learners get the feeling that a teacher is teaching them. There are a few more considerations that you need to keep in mind during content writing such as concept mapping, sequencing and linking of content, etc. Let us briefly discuss each of them.

- ***Concept Mapping****:* Before starting the writing, it is important to organize thoughts and ideas around the central theme or topic that are coming to your mind. How can you (or the content writer) do it effectively? The answer lies with the development of a concept map. What do you mean by concept map? Concept maps are spatial or

graphical displays that represent the relationship between the concepts and sub-concepts. According to Novak and Canas (2008), "**Concept maps are graphical tools for organizing and representing knowledge. They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts indicated by a connecting line linking two concepts. Words on the line referred to as linking words or linking phrases, specify the relationship between the two concepts**". It is the representation of cognitive structures depicting the hierarchies and the interconnections of concepts involved in a discipline or a sub-discipline. In a concept map, labelled nodes represent concepts and lines, or arcs represent the relationship between concepts as shown in Fig.6. Se we can say that a concept map identifies the way individuals think and see relationships among concepts. Therefore, you may develop the concept map so that it will be easy to present the content in the unit logically and systematically.

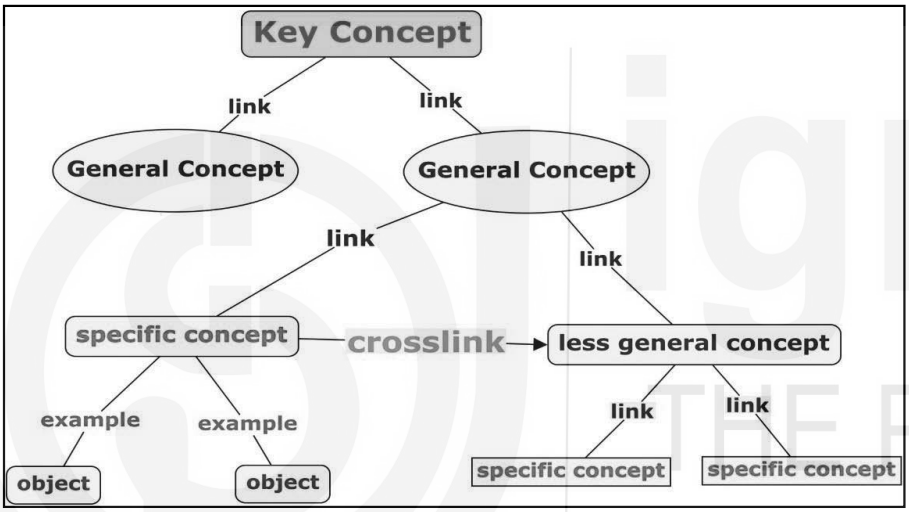


Fig.6: Prototype of a Concept Map

- ***Sequencing:*** After developing the concept map, you can easily decide the sequence of various concepts and sub-concepts to be included in the unit (or instructional material). Sequencing is defined as the efficient ordering of the content to improve the learners understanding and help them achieve the objectives (Morrison, Ross & Kemp, 2007). For example, if a Mathematics teacher is going to write about calculating 'standard deviation', the knowledge and skill to calculate 'mean' and 'square root' is a prerequisite. In a History lesson, sequencing events is very important as failure or success in one event triggers another. So, it can be understood that in various subjects, different types of sequencing are required. While sequencing, the organization of the content from concrete and physical to abstract and symbolic is very important. The logical arrangement of the content is always beneficial for learners as well as teachers.

In a handout developed by the instructional design team of Texas tech university, six types of content sequencing have been suggested. They are given below in Table 2.

Table 2: Types of Content Sequencing

Sequencing	Definition
Concrete-Abstract Sequencing	It is a type of sequencing method requiring the organization of the content from concrete and physical to abstract and symbolic.
Deductive Sequencing	It is a type of sequencing method requiring the organization of the content from general to specific.
Easy-to-Difficult Sequencing	It is a type of sequencing method requiring the organization of the content from easy to difficult.
Hierarchical Sequencing	It is a type of sequencing method requiring to teach simpler components skills of the content, before moving to more complex skills.
Procedural Sequencing	It requires teaching the first step of a procedure in the sequence and then helping the learners to complete the remaining steps
Scaffolding	It includes a variety of sequencing methods that reduces the support little by little and increases the standard of performance gradually.

(Source:http://www.tamus.edu/academic/wp-content/uploads/sites/24/2017/07/Content-Sequencing-Handout-v2.0.pdf)

- ***Linking:*** Like concept mapping and sequencing, linking is also important while developing the textual content. There are certain concepts, which may be discussed in other units (or lessons), but their knowledge is essential to move ahead in the present unit (or lesson). A good instructional designer/content writer never repeats the content in a new lesson but gives references (hyperlinks, in the case of e-text) to the concept already described. Similarly, some concepts may not require much elaboration in the present text but in forthcoming lessons. In that case, the forthcoming lessons will be given as a reference.

When you write textual content, you can use various types of 'linking'. Some of them are as follows:

i) ***Linking with the previous work/text:*** While writing a new text (or unit), you need to link with the previous content wherever possible. Say, for example, think that you have explained the concept of 'concept map' in a unit on 'content planning tools'. The next unit is on 'assessment tools'. You are aware that a 'concept map' is also an assessment tool. In that case in the new unit, you should not repeat the concept of 'concept map', but mention that *it is explained in the previous unit* (or mention the unit number) and explain only how the concept map is used for assessment.

ii) ***Linking additional resources:*** While writing a text, a brief description of some definitions, concepts, reports, documents, etc., will be used. But, if you feel that a few learners may be interested to go into details, then links, hyperlinks, or references to those resources should be given in the text.

iii) ***Linking between theory and practice:*** This type of linking is observed in textual material developed for professional or practical-oriented courses. In such cases, the theoretical part will be discussed in the text and links are inserted for practical activities given in the handbook.

iv) ***Linking text with tables and graphs:*** While writing a text, sometimes tables and graphs are also used to clearly illustrate the concept with clarity. At many places in the section, linking of table or graph is being done to avoid repeating the same table or graph many times.

v) ***Linking audio/video resources:*** In the text, sometimes the audio/video content is also linked to illustrate and clearly explain the concept with clarity. For this, two common practices are used. First, giving URL links of audio/video content at respective places and second is inserting QR codes of such resources in the text. The benefit of inserting QR codes is the quick accessibility to the content by scanning with handheld devices like mobile phones, tablets, etc.

Check Your Progress 2

Note a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

1) What are the different types of 'linking' in the text?

……

……

……

……

Activity

1) Go through the objectives written in any five units of your choice. Analyse those objectives in the light of the 'characteristics of objectives' suggested by Mager.

2) Select a topic and its related subtopics as per your choice on which a SLM unit needs to be developed. Develop a concept map of it.

11.5 EDITING THE TEXT

Once the writing of the text (or unit) is over it requires several rounds of editing to make it error-free and ensure the quality. With editing, overlapping, unevenness and suitability of the content as per the level of learners, language as well as the writing style of various sections (especially if they have been taken from different sources), uniformity in the format, etc., are checked and refined. Editing is performed by subjects experts (known as editors). Generally, four types of editing are being done in a unit that is format editing, content editing, language editing, and copy editing.

The subject experts or editors need to ensure three aspects of a unit (Source: http://egyankosh.ac.in/bitstream/123456789/46223/1/Unit-7.pdf)). They are as follows:

i) ***Educational effectiveness:*** This means making the text suitable for self-learning. The self-learning makes use of the principles of independent learning. Therefore, while editing the unit, the subject

expert must ensure that it is suitable for self-learning and help learners achieve the instructional objectives as intended by the unit writer.

ii) ***Academic credibility****:* This means the level, adequacy and accuracy of the content of the unit. The subject expert must ensure the credibility of the content discussed in the unit.

iii) ***Readability of the text****:* This means the appropriateness of the language used in the unit. The subject expert must ensure that the language is simple and written in a conversational style.

Let's now discuss the various types of editing that are carried out in a unit.

11.5.1 Content Editing

You have already read many courses of this programme. This makes clear that you learned the courses by reading the content given in the text material. So, we can say that content is the key element of any text (or instructional material). Ensuring the usability, validity, and appropriateness of the content are essential requirements of any text material. This is being ensured with the help of a senior academician/expert. What will the content editor do? The content editor read the entire text material and check various aspects of it. Say for example, whether the content is written as per the syllabus, logically and systematically presented and so on. The content editor ensures the academic relevance, quality, content validity and logical presentation of the content in the text. The content editor also ensures that the content presented in the text is in tune with the instructional objectives set by the content writer. A content editor also check the following aspects, whether the logical relationship and sequencing have been followed in the sections and subsections, only relevant information and examples are given, content is clearly explained, activities and exercises have been given at appropriate places, and controversial or wrong information/quote is not given, etc., and appropriate changes are made in the text. If the content editor realizes some content is missing, he/she suggests adding it.

11.5.2 Language Editing

After content editing of the text material, it is subjected to language editing. To make the text linguistically correct, it is required to be edited by a language expert. Many times, language editing is taken care of by both the content writer and content editor. If the content of the text material is not developed in the mother tongue of the writer or editor, there are possibilities of grammatical errors, ambiguity in explanation, use of unnecessary text, spelling errors, etc. Such mistakes are also rectified by the language editor. During the language editing, the language editor takes care of the following points and makes changes wherever required:

- Grammatical and spelling errors in the text.
- Vocabulary and technical terms used in the text.
- Use of syntax and idioms.
- Simplicity and clarity of thoughts and ideas expressed.
- Text is written in a conversational style.
- Text is written as per the language level of the learners.

11.5.3 Copy Editing

Copy editing is the mechanical aspect of editing text. The copy editing is performed by a copy editor. A copy editor ensures that the layout of the

text material is the same as decided by the institution/university. Nowadays, most of these aspects are being taken care of by the content writer. The copy editor focuses on the following aspects:

- The page of the unit/block wherein the name of the experts, unit writers/authors, editors, production staffs, etc., and the titles of the courses, blocks, and the units/lessons are mentioned.
- Specifications about the font size of the block/unit titles, sections, sub-sections, subheadings, etc., and the numbering of it.
- Starting of each unit/lesson- Whether a new unit/lesson starts on a new page, space is given before the new unit/lesson, etc., are checked.
- Blank space for activities, exercises, etc., is given within the text.
- Conventional practice of giving the title and numbering for tables, figures, graphics, photographs, etc., are followed or not.
- Alignment of paragraphs, margins, etc., to maintain the uniformity of the physical look of the unit/text material.
- The sharpness of letters/characters and space between words and lines.
- Ensuring all other elements of layout in the printed text material.

11.5.4 Format Editing

'Format editing means ensuring the essential elements and structure of the text are in order. Every instructional designer/institution/mode has a set format to present the content in a unit. The format editor (who generally happens to be an educational technologist or ODL/online pedagogy expert) looks for common issues like layout, design, and font (like, size, uniformity, etc.) of the unit. How the starting, main body, and end section have been organized in the text? How the differentiation has been made between sections and subsections? Are the important informations/facts being presented in a distinct manner (**bold,** *italics,* etc.)? A format editor looks for such aspects and make changes wherever required.

Check Your Progress 3

Note a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

1) Why content editing of a text (or SLM Unit) is important?

……

……

……

……

11.6 DEVELOPMENT OF AUDIO AND VIDEO RESOURCES

You are aware that SLMs (or text) are the commonly used instructional materials in the ODL system. Along with text, audio and video programmes resources (or programmes) are also used for self-learning. Audio and

video resources were initially being used as supportive and supplementary instructional materials along with print-based learning materials in the ODL system. But with the increased access and penetration of ICT in teaching-learning, audio and video resources have acquired a prominent place in the instructional delivery system. Nowadays, they are extensively used and are sometimes as primary resources of learning. You should also understand that many online and blended education systems also use audio and video resources as major media for learning. Say for example, in many MOOCs, video lectures are used as a primary resources of learning. You must have witnessed the increasing use of audio-video tutorials and programmes and podcasts by many educational institutions. Say for instance IGNOU use SLMs and video tutorials for the instructional delivery of its programmes. Along with that Interactive Radio Counselling (IRC) and teleconferencing sessions are also used for instructional delivery. Even students studying conventional courses can also make use of SLMs and audio-video resources for learning. Thus, we can say that audio and video resources are used in conventional, ODL and online and blended learning systems.

Why are audio-video resources used in teaching-learning processes? Audio and video resources facilitate learning by depicting real-life scenarios, providing conceptual clarity, allowing hearing or viewing the experts' viewpoints, etc. Say for instance if a teacher wants to show a science experiment to their students which is practically impossible in the classroom, then the video depicting that experiment can be shown to the students. Viewing the video helps students clearly understand concepts. This also arouses interest and motivates students to learn. Videos can also be used to initiate a discussion. Say, for example, to teach the concept of 'pollution', videos related to that concept can be shown to students and a discussion can be organized. The flipped classroom approach makes use of videos to help students understand the subject matter. In flipped classroom approach, the subject matter is not directly taught but students are directed to watch videos beforehand and their doubts are clarified by engaging them in discussions that are held in the classroom.

How are audio-video resources shared with the learners? In the 1960s audio and resources were disseminated with the help of radio and television using terrestrial broadcast. Thereafter digitization and the emergence of the internet have changed their face. Nowadays modern technologies are used to disseminate audio and video resources. The DD-Gyandarshan channel, DTH Channels of the Ministry of Education (SWAYAMPRABHA), regional channels like VandeGujrat, web radio like Gyandhara, YouTube channels of institutions/universities, SWAYAM courses, Podcast channels, social media platforms, etc., makes use of modern technologies to disseminate audio and video resources. Through these technologies and platforms, audio-video contents is made available to learners.

From the above discussion, you might have understood that audio and video resources are also major resources of learning. You might have seen various audio-video resources on the internet. Can you use those resources in your teaching? You cannot because many of them may not be suitable for your learners. Along with that, there are copyright issues associated with it. However, you can use audio-video resources that are Open Educational

Resources (OERs). Since there are limitations for using audio-video resources available on the internet, you must try to develop audio-video resources. To develop audio-video resources, you need to be aware of the various steps involved in it such as planning of the programme, script writing and development of the programme. Let us discuss these steps in detail.

11.6.1 Planning of the Programme

Have you ever developed audio-video resources? If then take some time to note down the steps that you have followed in developing it in the space given below.

……
……
……
…….....

Planning is the first and foremost step in the development of audio-video resources. It is essential to plan each step very systematically. While planning you should consider the following aspects:

- ***The purpose:*** Why do you need an audio or video resource? For what purpose you will utilize it in the teaching-learning process (e.g., to initiate a discussion or topic, explain a concept, give some exercises, demonstrate an experiment, explain the steps of a process, etc.).
- ***Format:*** You may be aware that, every content/topic cannot be explained through an audio or video resource. What format is good for a particular content? Whether it will be an audio or video resource? For the content in which demonstration, action, drama, or real-life examples are required, a video is preferred. Audio will be a good choice to explain a concept, hear someone's viewpoint, and storytelling on subjects like History, etc.

  The format of audio-video resources must also be decided. There are different formats of audio-video resources like interview, lecture, demonstration, discussion, documentry, roleplay, storytelling, drama, etc. You may choose a suitable format as per the type of the content, need of the learners, availability of resources, etc.
- ***Technology infrastructure:*** It is essential to consider the technology infrastructure (hardware, software, or both) available at your workplace while developing the audio-video resources. At the same, you should take into account the infrastructural facilities available at the learners end for utilizing the audio-video resources that are being developed. What type of technologies are required to record and edit? From where will you access those technologies? Do you require human resources to develop the audio-video resource? Such questions are important to answer.
- ***Cost:*** Cost is also an important consideration. The cost of equipment, recording and editing, hosting platform, telecasting or streaming, and payment to experts, etc., are to be considered during the development of audio-video resources.

11.6.2. Script Writing*

Script writing is the next step in the development of audio-video resources. The script is a carefully devised blueprint that charts out instructions for speakers, producers, editors, and technicians. Creativity, imagination, and cooperative efforts are the keywords of the scripting process. Script writing goes through certain stages. These stages are as given below:

- ***Programme idea:*** Initiate the programme idea and evaluate it against media selection criteria for audio/video production. Say for instance, if you plan to develop a programme on the topic 'verb' in English, which media will be suitable for it? If it satisfies the criteria, accept and finalize the idea and move forward to the next stage.
- ***Programme brief/outline:*** A programme brief is a framework that outlines precise details of the programme such as title, target audience, duration, programme (or learning) objectives (in behavioural terms), and content outline or synopsis.
- ***Programme research:*** You must conduct research on the topic and the target audience. You have to look for visual materials and other important interesting information about the topic. For this, you may read books, encyclopaedias, journals, etc., and discuss with subject experts, etc.
- ***Selection of materials:*** Select the most relevant materials, resources, and ideas, which help attain learning objectives. Estimate and determine how much content should be included in the final programme. Eliminate what is not directly relevant to your objectives.
- ***Programme design strategy/message planning:*** At this stage, decide the programme design and presentation strategy. Explore and create interesting ways of dishing out your programme to your audience. Always keep in view your viewer's interests, nature of subject/topic, programme objectives, and the visual possibilities that your medium can offer. Give serious thought to such considerations as presentation format or a combination of formats, programme style, pace and approach, examples, attention-getting devices, humour, repetition of key ideas, use of graphics, animation, and other production resources.
- ***Programme structure and visual treatment:*** It is concerned with the creative process of giving the programme a clear shape and form. Here, give some thought to questions such as which sequences will form the middle (body) of the programme. Think of a good beginning for your programme because it is the opening sequence of a programme, which catches the attention of the audience, and it can certainly mark the whole show. Also, think of a good and realistic ending. Think of visual representations/visual analogies for abstract ideas and key concepts. Give a logical and natural order to your programme segments, so that they appear to be evolving from one sequence to the other. The treatment should give a full description of what the viewers will see, hear, think, and feel.

---

* The section has been adopted from Unit 3, Writing Scripts for Audio/Video programmes, ES-318, SOE, IGNOU

- ***Preparation of storyboard:*** During the development of video resources, you need to decide, how to start, what to speak, how to end, what supporting words will be used, what graphics and images will be shown in between, what music and sound effect will be played in between, etc. These kinds of microscopic details of the entire programme must be prepared. This is done with the help of preparing a storyboard. A storyboard means a detailed, shot-by-shot description of the programme on a sheet of paper divided into two vertical columns. The rectangular boxes (3:4) in the left-hand column are used for mentioning/drawing the pictures/sketches that need to be used in each shot and the right-hand column is used for writing supporting words, sound effects, music, etc. The format of a storyboard is given in Fig.7.

You should understand that during the development of audio resources, we will not use graphics, images, etc. Therefore, the first column of the storyboard need not be filled.

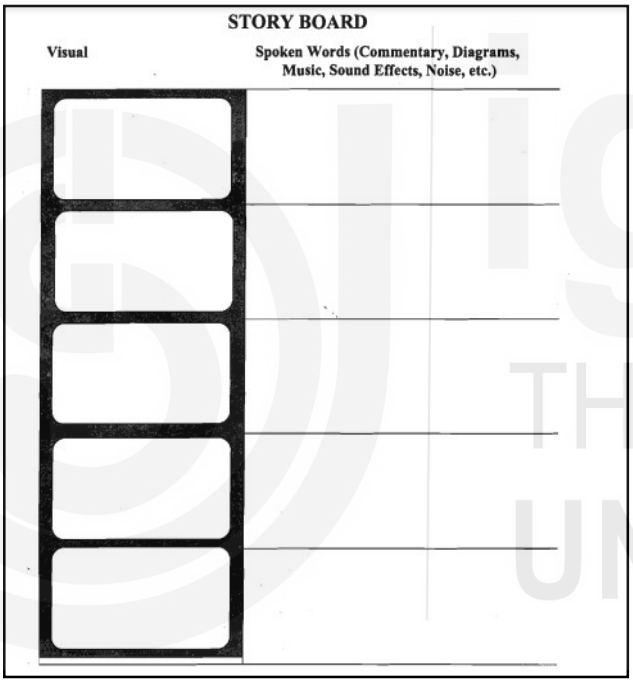


Fig..7: Storyboard Format (Source: ES-318, SOE, IGNOU)

Why is it important to prepare a storyboard during the development of audio-video resources? The storyboard is important because:

- It helps the content writer (or video author) to think in terms of visuals and recognize the images, graphics, sound effects, music, and text to be included in the video programme.
- It is at this stage that the script begins to appear as evolving, into a series of pictures in sequential continuity, with sound and action described alongside.
- It helps to reflect on the overall development and progression of the script.
- It is possible and advisable to make script changes, if any, by adding, deleting, shifting, or reshaping shots and sequences.

- It helps members of the production team to develop effective and quality video programmes.

11.6.3 Development of the Programme

After preparing the storyboard, you can record the programme either at an audio or video studio. The studio will have a production team (like a producer, director, camera operators, makeup specialists, etc.) and necessary technologies to record the programme like a soundproof room, camera, computer, mic, lighting, etc. After completion of the recording, the recorded audio-video programme is edited. Then it is reviewed by the experts. Based on the review of the experts, if required, the audio-video programme is again edited and finalised.

You can also develop audio-video resources using your own digital devices like computers, mobile phones, etc. In that case, you have to use various software applications (or apps). The details of the software application used for recording audio-video programmes are discussed in Section 11.7. You also need a noise-free room to record the programme. Similarly, you may also require the help of software applications to edit the recorded audio-video programme. Nowadays many software applications perform both the functions that is recording and editing.

Check Your Progress 4

Note a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the Unit.

1) Why is it important to prepare a 'storyboard' during the development of video resources?

.....

.....

.....

.....

Activity

1) Select a topic of your choice on which a video programme (15-30 minutes) needs to be developed. Prepare a storyboard for the video programme.

11.7 ICT TOOLS FOR DEVELOPMENT OF AUDIO AND VIDEO RESOURCES

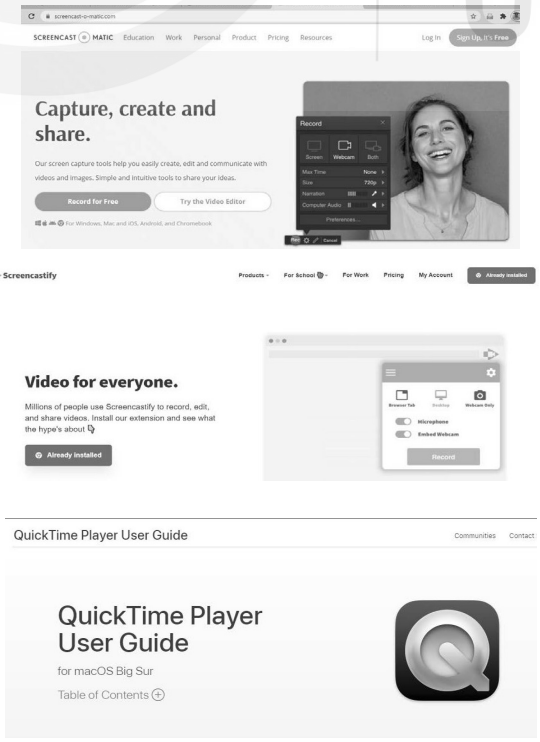
Most of the time, audio-video programmes are developed in the studios dedicated to it. You might have seen such studios that have facilities to record and edit audio-video programmes. These studios are slightly different from the studio that we use to click our own or family photographs. These days software applications are also available to develop audio-video programmes. You can use such applications and develop audio-video programmes for the benefit of learners. Let us discuss the development of various types of audio-video programmes and software applications used for them.

11.7.1 Screencast

The screencast is one of the most popular instructional video formats. A screencast is a form of a digital video, in which the computer or mobile screen is recorded with the audio narration given by the instructor. A screencast is a digital video recording of a user's screen and usually includes audio narration. They are also known as video screen capture or screen recording. A screencast can be a web demonstration, PPT-based video, explanation of some process, software demonstration, etc. Whatever is displayed on the screen will be captured during the development of the screencast. Say for instance you can develop a screencast to show your students 'process to insert tables in Google Docs software'. In that case, you will explain how tables are inserted and at the same time the process will also be demonstrated on the Google Docs software. So, in the final screencast students can listen to your narration and at the same time watch the process. Screencast saves your time because they can be prepared quickly.

To develop a screencast video, you need to follow the steps mentioned in Section 11.6. After that, you can start recording the programme on your digital devices like computers, mobile phones, etc. After recording, you may edit the programme. You can develop screencast videos at your home or workplace. But you may try to ensure that the selected place is noise-free so that external noises will not be captured while recording the programme. The minor noises that are captured can be removed during editing with the help of software applications. After developing screencast videos, they can be uploaded on the website of your institution, LMS, social media platforms, YouTube channel, etc. Thereafter the weblinks can be shared with your learners.

Screenpal, Screencastify, QuickTime Player, and A-Z Screen Recorder are some of the popular software applications used to develop screencast videos. The homepage of these apps is given in Fig.8. You can also use these apps to develop audio programmes, video programmes without a recording screen, etc.



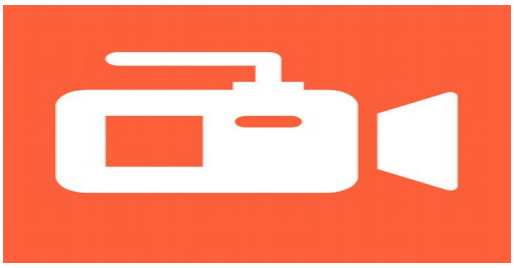


Fig.8: Home Page of Screenpal, Screencastify, QuickTime Player and A-Z Screen Recorder

11.7.2 Audio-Video Streaming

You are aware that in general video files will be shared with the students through various means and technologies like e-mail, social media, LMS, etc. Students can watch them directly or need to download those files to view later. There are also facilities to watch videos without downloading them. This is possible by streaming the media files. What do you mean by streaming? Streaming is a method of viewing a video or listening to audio content without actually downloading the media files. So, when you deliver a lecture, your video or audio or both can be streamed. This helps students to watch and listen to your lecture in real-time. Video streaming is also a popular instructional strategy. Streaming is done using various conferencing tools like *Google Meet, Microsoft Team, Zoom,* etc., for a selected group or by delivering lectures to a larger audience using *Facebook or YouTube* live. All these interactions can be recorded and archived for future use. Apps like *StreamYard or Open Broadcasting Software (OBS)* are used to stream the lectures and simultaneously make them available on various social media platforms like Facebook, YouTube, etc.

Fig. 9: Home Page of StreamYard and OBS Studio

11.7.3 Video Editing

The video programmes produced using various apps need to be edited before uploading or sharing with learners. This enhances quality as well as allows removing undesired contents from the video. Editing is also needed to reduce file size and develop desired video format to upload or share.

Openshot Vidoe Editor, ActivePresenter, etc., are some of the popular free video editing apps. Video editing apps facilitate visual as well as audio editing.

Fig.10: Home Page of Openshot Video Editor and ActivePresenter

11.7.4 Audio-Recording and Editing

We have discussed that audio programmes are also used as instructional materials. Audio programmes has a few advantages compared with a video, that is it consumes less bandwidth. Similarly, it is easy to download and learners can listen to them anytime at his/her convenience. How audio programmes are developed? You may use the apps designed for the preparation of audio programmes. Nowadays computers and smartphones have inbuilt audio recorders. You may use such inbuilt audio recorders or apps specifically designed to develop audio programmes. One of the popular apps *Audacity* enables both recording and editing of audio programmes. Audacity is an open-source app. Therefore, you can use them without paying the license fee.

Fig.11: Home Page of Audacity

11.7.5 Podcast

Podcasts are becoming very popular in the field of education. What do you mean by a podcast? A podcast is a series of audio events on a theme, where digital audio files in form of episodes are uploaded on various podcast platforms and learners can download and listen to these on their devices. Many institutions have started their podcast channels. You need to subscribe to it to listen to it, get notifications of new uploads, and follow it on hosting platforms. Various podcast streaming applications have made

it more convenient for learners. There are various podcast hosting sites like *Buzzsprout, Anchor, Podbean, Simplecast, Resonate, Spreaker,* etc. On those sites, podcasts can be uploaded, links can be shared, and learners can listen to them.

11.8 LET US SUM UP

The Unit started with a discussion on various forms of textual content such as SLM, e-text, and interactive text. Various features and structure of SLMs have been discussed. The structure of the SLM includes an opening section, main body and end section. The SLMs are now prepared as e-texts, web pages or interactive texts. Thus, the Unit also focused on explaining the latest trends of SLMs that is e-texts, web pages and interactive texts. Then the Units have given you an idea of the process of text development. As part of it, the steps of writing instructional objectives by citing examples are discussed. You need to keep in mind to use action verbs while writing objectives. The Unit has also discussed important aspects of content development for text. Four major types of editing in text, i.e., format editing, content editing, language editing, and copy editing have been highlighted with their importance to make the text more readable and learner-friendly. Apart from text, audio and video resources are also popular forms of instructional materials. These days audio-video resources are prepared and used for instructional purposes. How are audio/video resources developed? The Unit has given you an idea about the process of development of audio-video resources with a focus on considerations for the content planning, steps of scriptwriting, and preparation of storyboard. In the last section of the Unit, some ICT tools have been suggested for developing audio and video resources on your own which include apps for the screencast, live streaming and recording, and podcast.

11.9 UNIT END ACTIVITIES

1) Go through at least three different units of three different courses of this programme. Whether these units are prepared including the essential components of a SLM? Reflect on it.
2) Discuss the importance of editing of SLMs?
3) What is a storyboard? Select a topic of your choice on which you plan to develop an audio programme. Prepare a storyboard for the audio programme.
4) Explore any three educational video programmes available on different platforms and analyze how effective they are for your learning.
5) Select a topic of your choice and develop a 15–30-minute video programme on the selected topic using any free screencast application.

11.10 REFERENCES AND SUGGESTED READINGS

Doolittle, P. E. (2001). *Instructional design for web-based instruction*. Retrieved from http://staff.washington.edu/rel2/geog100-UW/Archive/instructionalsequence.pdf.

http://www.tamus.edu/academic/wp-content/uploads/sites/24/2017/07/Content-Sequencing-Handout-v2.0.pdf.

Lakshmi Reddy, M.V. (2018). *Development of self-learning print materials, BESE-131 Open and Distance Education.* New Delhi: IGNOU. Retrieved form http://egyankosh.ac.in//handle/123456789/46223.

Morrison, G. R., Ross, & Kemp, J. E. (2007). *Designing effective instruction (5th Edition)*. Hoboken, NJ: John Wiley & Sons.

Ranga, V., & Koul, B.N. (2017). *Writing scripts for audio and video programmes, ES-318 Communication Technology for Distance Education.* New Delhi: IGNOU. Retrieved from http://hdl.handle.net/123456789/8366.

Singh, G. (2018a). *Aims and objectives of science teaching-learning, BES-141 Pedagogy of Science.* New Delhi: SOE, IGNOU. Retrieved from http://egyankosh.ac.in//handle/123456789/46664.

Singh, G. (2018b). *Organizing teaching-learning experiences, BES-141 Pedagogy of Science.* New Delhi: SOE, IGNOU. Retrieved from http://egyankosh.ac.in//handle/123456789/46678.

11.11 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) The components included in the end section of a SLM unit are Summary / Let Us Sum Up, Unit end exercises, Glossary / Keywords, References and Suggested Readings, Answers and Feedback to SAQs.

Check Your Progress 2

1) Linking with the previous work/text, linking additional resources, linking between theory and practice, linking text with tables and graphs, and linking audio/video resources.

Check Your Progress 3

1) Content editing helps to check whether the content presented in the text is in tune with the instructional objectives set by the content writer, logical relationships and sequencing are followed in the sections and subsections, only relevant information and examples are given, clearly explaining the concepts, activities and exercises are given at necessary places, and controversial or wrong information/ quote is not given in the text.

Check Your Progress 4

1) Storyboard helps get an idea of the visuals, images, graphics, and text to be included in the video programme going to be developed. This also helps the production team to develop effective and quality video programmes.