

Development of Self-Learning Materials and E-Learning Material



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1. Introduction

This handbook is for individuals working or planning to work in distance education systems. It outlines the role of a course writer and demonstrates how previous experience with face-to-face teaching can be applied to writing for distance learners. The goal is to equip you with skills to produce effective self-learning materials.

Quality study materials are crucial for distance education systems. Course writers face a challenging task of developing self-learning materials that utilize various communication channels. We have gathered experiences from other institutes to create a flexible and effective model for Indian conditions, which can be improved upon.

This handbook aims to demonstrate how self-learning materials can effectively substitute for a live teacher, thereby allowing distance learners to have the same learning experiences as students in a classroom setting. The handbook consists of seven sections that cover two important phases of print materials in distance education: a) the entire process of writing self-learning materials and b) the revision of these materials. The revision of self-learning materials is just as important as their initial development. This is because every distance teaching course needs to be updated from time to time to incorporate new developments in the field of study or discipline. Additionally, feedback from students, tutors, counsellors, experts, and others can be used to review the performance of courses and make them more relevant, learner-friendly, and academically rich.

We hope that this booklet will be useful not only to individuals, but also to institutions and personnel working in any sector who wish to use distance mode to impart education and training. It will also be beneficial to emerging distance education institutions and open universities in India. We welcome feedback and suggestions to improve the format presented herein and to develop better and dependable models for writing and revising self-learning materials.

2.Objective

The handbook is designed to help you achieve the following objectives:

- Develop clear objectives for a self-learning unit;
- Choose appropriate subject matter for your discipline/subject;
- Determine the most effective sequence for teaching the material;
- Create comprehensive sections and sub-sections to present the content;
- Design effective assessment questions;
- Evaluate your materials for effectiveness; and
- Identify the need for and strategies for revising your self-learning unit.

3. SELF-LEARNING MATERIALS

Self-learning materials (SLMs) are becoming increasingly popular worldwide, both in developed and developing countries. This mode of education is flourishing as more open distance education institutes and universities are emerging to cater to the growing number of learners and changing societal conditions. Besides subject-based teaching, SLMs are used to provide much of the professional and industrial training for in-service education and lifelong learning.

SLMs are designed for learners to use independently, either on-site or at a distance. They comprise all the materials needed to encourage independent study and learning. In distance education, learners have less contact with the institution or tutor, and they heavily rely on these pre-prepared teaching materials that are largely pre-planned, pre-produced, and pre-packaged.

3.1 Terms used

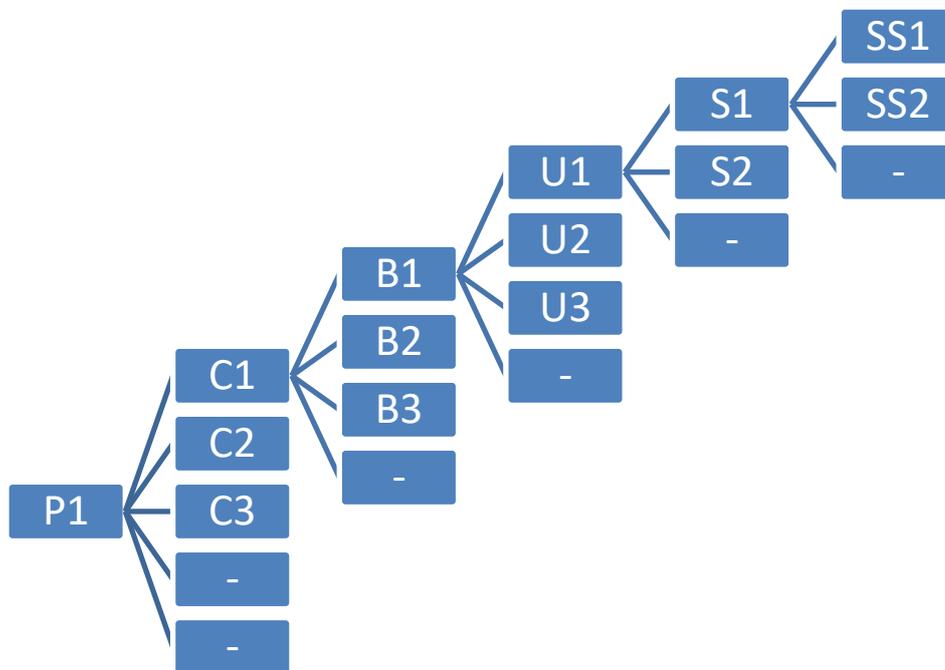
As a course writer, it is important to be familiar with the terms used in distance education. Understanding these terms can help you write self-learning materials effectively. Let's take a look at some of the important terms that are used at D-CODE:

- **Programme:** A curriculum or combination of courses in a particular field of study. For instance, Undergraduate programme, Diploma programme in Management, Post-graduate Diploma programme in Distance Education, M.A. programme in English etc.
- **Course:** A programme is divided into courses, Each of which consists of a printed booklets called blocks, assignments, and any other relevant material.
It's important to note that a programme consists of several courses. For example, an Undergraduate Programme may include courses in History, Economics, Political Science, and a language.
Programme is a superordinate term, while *Course* is a subordinate one.
- **Block:** Each course is divided into multiple blocks, with each block containing around 40-60 printed pages. The purpose of this division is to ensure that each block presents a unified theme, making it easier for learners to comprehend and progress through the course.
The course materials are sent to learners in the form of multiple booklets, with each booklet representing a particular block. This approach is preferred because a single large book may appear overwhelming and intimidating to learners. Therefore, dividing the course into smaller, more manageable booklets provides learners with a greater sense of achievement and progress as they complete each block.
It is important to remember that each course comprises several blocks, with each block appearing as a separate booklet.
- **Unit:** A unit is a self-contained portion of a course covering one or more interwoven learning concepts. Each unit is broken into sections and subsections for clarity in the presentation of concepts, information, illustrations, etc.

When choosing a course, it's important to take into account the length of each unit. D-CODE courses usually have a unit with a length of 20 to 40 typed pages on A4 size paper. The decision to set this length was based on three key factors:

- **Pedagogy** plays an important role in managing the content load for learners. The content should be appropriate and manageable, with a unit being a pedagogical unit that can be completed within a reasonable time frame of 5-6 hours, or at most three sittings. Ideally, the best unit is one that can be completed in one sitting, but thematic continuity, attention span, economy, and bulk of print materials can force us to opt for a larger unit. However, the unit should not be too large to defeat its purpose.
- **Uniformity:** Furthermore, all D-CODE units should display a reasonable degree of uniformity because unit writers have to be paid according to a uniform scale. This necessitates standardizing the unit size.
- **Printing:** Open and distance education institutions also have to produce a standardized output with a specified size and length of each unit since the printer has to be paid for a particular size of a booklet.

All the units, blocks, and courses of a program are interdependent, and their hierarchical relationship is illustrated using the following diagram:



P-Programme

C-Course

B- Block

U-Unit

S-Section

SS-Subsection

Figure 1: Hierarchical Linkage Scheme

- Course **maintenance** involves keeping a 'correction file' organized unit-wise, receiving feedback, and making minor corrections in printed materials. This includes creating errata sheets, supplementary materials, revising extra readings, and preparing assignments, program guides, prospectuses, practical guides, and more.
- Course **updating** involves analyzing feedback from various sources, making minor changes in course content and presentation, and subsequently modifying program guides and delivery methods.
- **Revision:** Finally, program/course revision builds on the maintenance and updating of data, and the experiences accumulated over a few years of program delivery. It involves re-evaluating the entire curricular structure of the program, the multi-media self-learning materials, assignments and manuals, tele-conferencing and interactive radio counseling, laboratory and hands-on experiences, and the entire program delivery process.

3.2 Type – Setting and Text Processing as follows:

- a. The text shall be printed on both side of a page employing laser jet or Inkjet printer, the text having been processed using a standard text processor. The standard font shall be Times New Roman of 12 pts with 1.5 line spacing.
- b. **Page Format:** The Printed Sheets shall have the following written area and margins:
 - i. Top Margin : 15 mm
 - ii. Head Height : 3 mm
 - iii. Head Separation : 12 mm
 - iv. Bottom Margin : 22 mm
 - v. Footer : 3 mm
 - vi. Foot Separation : 10 mm
 - vii. Left Margin : 30 mm
 - viii. Right Margin : 20 mm

When header is not used the top margin shall be 30 mm.

- c. **Pagination:** Page numbering in the text of the report shall be Hindu- Arabic numerals at the center of the footer. Page number “1” for the first page of the Introduction Unit shall not appear in print; only the second page will bear the number “2”. The subsequent Units shall begin on a fresh page. Pagination for pages before the Introduction Unit shall be in lower case Roman numerals, e.g., “iv”.
- d. **Header:** When the header style is chosen, the header can have the Unit number and Section number (e.g., Unit 2, Section 3) on even numbered page headers and Unit title or Section title on the odd numbered page header.
- e. **Paragraph format:** Vertical space between paragraphs shall be about 2.5 line spacing. The first line of each paragraph should normally be indented by five characters or 12mm. A candidate may, however, choose not to indent if s/he has provided sufficient paragraph separation. A paragraph should normally comprise more than one line. A single line of a paragraph shall not be left at the top or bottom of a page. The word at the right end of the first line of a page or paragraph should, as far as possible, not be hyphenated.
- f. **Unit and Section Format:**
 - i. **Unit:** Each Unit shall begin on a fresh page with an additional top margin of about 75mm. Unit number (in Hindu - Arabic) and title shall be printed at the center of the line in 6mm font size (18pt) in bold face using both upper and lower case (all capitals or small capitals shall not be used). A vertical gap of about 12 mm (spacing after font size 36 with single line spacing) shall be left between the

Unit number and Unit title lines and between Unit title line and the first paragraph (sample is given as specimen „E“).

- ii. **Sections and Sub-sections:** A Unit can be divided into Sections, Sub-sections and Sub-sub Sections so as to present different concepts separately. Sections and sub-sections can be numbered using decimal points, e.g. 2.2 for the second section in Unit 2 and 2.3.4 for the fourth Sub-section in third Section of Unit 2. Units, Sections and Subsections shall be included in the contents with page numbers flushed to the right. Further subsections need not be numbered or included in the contents. The Section and Sub - Section titles along with their numbers in 5 and 4mm (16 and 14 pt) fonts, respectively, in bold face shall be flushed to the left (not centered) with 15 mm space above and below these lines. In further subdivisions character size of 3 and 3.5 with bold face, small caps, all caps and italics may be used for the titles flushed left or centered. These shall not feature in the contents.
- iii. **Table / Figure Format:** Tables and figures should be presented in portrait style as far as possible. Small size table and figures (less than half of writing area of a page) should be incorporated within the text, while larger ones may be presented on separate pages. Table and figures shall be numbered Unit -wise. For example, the fourth figure in Unit 5 will bear the number Figure 5.4 or Fig 5.4. Table number and title will be placed above the table while the figure number and caption will be located below the figure. Reference for Table and Figures reproduced from elsewhere shall be cited in the last and separate line in the table and figure caption.

3.3 Self-learning Materials v/s. traditional education system

Let us begin by examining the similarities and differences between face-to-face and open-distance teaching. You can discuss this topic with people who have direct experience with both forms of teaching. This discussion can help you understand open-distance education better and identify potential challenges you may face when writing a course for distance learners. Most of our course writers come from traditional institutions, so it's helpful to compare classroom settings, classroom management, and the role of the teacher in both types of teaching to write a course that meets the needs of distance learners.

In the traditional education system, students receive most of their instruction through face-to-face interactions with teachers, and they attend classes regularly with their peers. Students in this system use existing textbooks, and no unique materials are created for them. However, self-learning depends on specially prepared or transformed materials for a specific target group. In self-study, learners have limited opportunities to interact with teachers and peers, unlike in traditional classroom situations. This loss is compensated for by self-learning materials specially designed to promote independent learning.

Here is a table that outlines some of the main differences between self-learning and traditional instructional materials like textbooks.

Textbooks	Self-Learning Materials
Assume interest	Arouse interest
Written mainly for teacher use	Written primarily for Learner use
Do not indicate study time	Give estimates of study time
Designed for a wider market	Designed for a particular learner group

Rarely state aims and objectives	Always give aims and objectives
Structured for teachers and specialists	Structured according to the need of learners
Little or no self-assessment	Major emphasis on self-assessment

The course material provides independent learning, acting as a teacher, guiding, motivating, explaining, and reminding.

3.4 Characteristics of Self-learning materials

Self-learning Materials (SLMs) are distinct from a chapter of a textbook or an article in a journal. Textbook chapters tend to present information in a very condensed form and are closer to reference material than to learning materials. They are organized according to the subject matter rather than to aid learning. Similarly, articles in journals are a means of communicating with peers in the profession. In contrast, SLMs are designed for learning, and are therefore the primary instrument for this purpose. The main characteristics of SLMs are discussed in detail below:

- I. **Self-explanatory:** The content should be easy to understand and follow without requiring much external assistance. It should be presented in a clear and concise manner, with a logical flow that maintains consistency throughout. In order to achieve this, the content is analyzed thoroughly before being presented. This helps to promote self-learning on the part of the learner.
- II. **Self-contained:** Efforts should be made to create self-sufficient learning materials for distance learners, so that they don't have to rely on external sources or teachers. Many distance learners face geographical, physical, and psychological barriers that make it difficult for them to access support. Therefore, it's crucial to ensure that the material covers all the essential details and information required by the learners and avoids presenting non-essential material. Identifying adequate content is always a challenge for distance teachers and course writers. Do you agree?
- III. **Self-Directed:** The study materials should offer learners guidance, hints, and suggestions at every stage of their learning journey. Self-directed materials should be presented through straightforward explanations, sequential development, illustrations, and learning activities. These materials play the role of a teacher who guides, instructs, moderates, and regulates the learning process in classroom situations. Therefore, the course material should direct the entire learning process. In conventional classroom situations, some teachers do not engage in activities like guiding, instructing, moderating, and regulating the learning process for various reasons such as time constraints, teacher style, or lack of interest. However, in the context of distance learning, course writers must take care of these components and direct the learning process in the course material so that learners can direct their learning process without a teacher.
- IV. **Self-motivating:** In distance education systems, students spend most of their study time away from the campus. It is crucial that the study materials, like a live teacher, are highly engaging and motivating to the learners. These materials should spark curiosity, present problems, relate knowledge to familiar situations, and make the learning experience meaningful. However, creating such situations requires extra effort from the course writer. It is essential to reinforce the sense of learning and retention at every stage of the process.
- V. **Self-evaluating:** It is important for open and distance institutions to provide feedback to learners who may be physically separated from teachers or study materials. This feedback helps learners evaluate their progress and stay motivated. Self-evaluation in the form of self-check questions, activities, and exercises can provide this much-needed feedback. To ensure that learners are on the right track, course writers should develop a built-in evaluation system

that includes an appropriate number of self-check exercises, activities, and "check your progress" questions. Additionally, course writers should prepare model answers to the questions, exercises, and activities so that learners can assess their own learning progress. This indication of progress can further motivate learners to do better.

VI. Self-learning: Self-learning materials are designed to facilitate independent learning. Each unit provides learners with a study guide that includes directions, hints, references, and other resources. To help learners understand the content, it is presented with simple explanations, relevant examples, clear illustrations, and engaging activities.

3.5 Access Devices

Access devices refer to the tools that help the course writer bring the content closer to the learners, and also help the learners easily access the material.

These devices play three essential roles:

- They allow learners to locate the content they need to read in a unit.
- They make the content more understandable and relatable to the learners, helping them better comprehend the material.
- They act as a teacher within the material, providing guidance and support to learners akin to a live classroom teacher.

Some of the access devices are explained below:

- **Cover page:** Course writers do not need to worry about the cover page of their course. However, course coordinators should choose a suitable cover design that communicates a broader perspective of the course to the learners and acts as an access device. To get an idea in this regard, you may refer to a few samples of cover pages produced by D-CODE in the following pages.
- **Title:** It is important to provide a clear and informative title for our unit, one that can effectively convey the topic of the unit to learners. For instance, simply labeling a unit as 'Distance Education' may not be sufficient to accurately communicate its purpose. Instead, we should make the title more explicit and specific, such as 'The Process of Course Production in Distance Education'.
- **Structure of the Unit:** The material should be structured with itemized sections and subsections in the order of occurrence to draw the learner's attention to the subject matter.
- **Objectives:** The objectives of the unit should be defined clearly in behavioral terms.
- **Division of Content:** In order to improve accessibility, we have divided the units into sections and subsections, making it easier for learners to read and understand. Each section is indicated by bold capitals and each subsection by small but bold typeface. Significant divisions within sub-sections are also in bold typeface for learners to easily navigate their place within sub-sections, and the items that require highlighting are numbered (i.e., (i), (ii), etc.). We have consistently applied this partitioning scheme in every unit throughout the D-CODE courses for the sake of uniformity. Generally, each Unit begins with the Objectives section, which briefly outlines the unit's objectives.

Please keep in mind the following points that we presented in the unit, and what we expect from learners once they complete working on the unit.

- In the last section of each unit, we summarize the entire unit for recapitulation and easy reference under the heading, "Let Us Sum Up." We can replace the expression "Let Us Sum Up" with other expressions such as "summary" or similar ones.
- Moreover, we provide self-check exercises titled "Check Your Progress" at some points in each unit. These exercises always end with model answers/possible answers to the questions set in them.
- To support the content, appropriate illustrations, diagrams, charts, graphs, photographs, etc., should be provided. A concept map or flow diagram can show the interconnections of the content more clearly.
- After the summary, we should give adequate glossaries of keywords, new concepts, and technical expressions in the unit.
- We should remember that our learners are physically separated from institutions. Therefore, we must provide precise and unambiguous instructions on how to go through the unit.

4. BASIC CONCEPTS

It is important to understand that distance education systems operate differently from conventional education systems. As a result, a course writer must have a thorough understanding of the various distance education systems. Below are some of the prerequisites that a course writer should consider before commencing course writing.

Familiarity with the system: The course writer must have a clear understanding of the instructional methods and systems used in open and distance education institutions. D-CODE provides educational opportunities to individuals who are unable to access formal education due to reasons such as employment obligations, social and domestic constraints, economic challenges, and geographical remoteness. Therefore, an open distance learning system has been adopted to make education more accessible to a larger and diverse group of people.

In this educational system, learning is conducted through distance teaching and learning methods. This means that learners study on their own at a time that suits them best, and they have the flexibility to learn at their own pace. It is assumed that all learners are highly motivated to achieve their set objectives, and this motivation has a significant impact on the content, syllabus design, and delivery mechanisms of the distance education system.

Open and distance education institutions work like an industrial system, where every process and stage of production is time-bound. Therefore, if you accept a task such as writing a unit or a block, you should be committed and make every effort to complete it within the given time frame. Failure to do so can disrupt the production schedule, which, in turn, can lead to the failure of the entire system. Unlike conventional institutions, such situations are common in open and distance education. Therefore, we suggest that you carefully consider your schedule before accepting a task and then stick to it once you have committed to it.

4.1 Correspondence Vs. Distance Education

Let's begin by examining the differences between correspondence and open distance education. Correspondence education has long been viewed as an extension of the traditional educational system, with its main objective being to prepare students for standard board or university exams. In contrast, open distance education has a broader range of objectives, including personal growth, job training and enhancement, in-service education, lifelong and continuing education, attitude adjustment, and knowledge impartation. Most importantly, open distance education has a social purpose, which correspondence education has largely neglected. Historically, higher education has been a luxury afforded only to a select few. Education has been an exclusive pursuit, with only the economically and socially privileged having access to it. Open distance education seeks to bridge this gap by providing education to the masses while also fulfilling the constitutional obligation of equal opportunities for all. Open distance education is a promising solution that brings greater educational opportunities to everyone, regardless of traditional constraints like limited seats in educational institutions or geographical barriers. By making education more accessible to the masses, it also fosters social relevance and equips people with the necessary skills to become better professionals, citizens, and human beings. In this way, open distance education can serve as an important tool for democratizing education, which is why many developing countries are adopting it as a viable alternative for promoting higher education and democratization in their communities.

Correspondence education and open distance education have different orientations. Correspondence education is solely based on the distribution of didactic materials and its purpose is to impart information. On the other hand, open distance education aims to improve the process of learning and teaching by incorporating pedagogy into the course material. Despite the physical distance between the teacher and the learner, effective academic communication takes place via various means. Correspondence education, on the other hand, does not involve any such communication between the teacher and learner.

Correspondence education is a traditional way of teaching where learning materials are printed and sent through the postal system. On the other hand, open distance education is a modern approach that uses various communication methods, including face-to-face sessions, audios, videos, radio and television broadcasts, video conferencing, computers, and more. Open distance education aims to incorporate advanced communication technologies, but it's important to use each medium optimally. For instance, information that is best conveyed through print must be delivered through print only. Similarly, audio or video may be used for concepts that can't be presented in print.

4.2 Open education

Many people confuse the terms "distance education" and "open education". Open education is a non-traditional form of education that breaks away from the constraints of traditional university education. Some features of open education include non-restrictive admissions, multi-point entry, no age or qualification restrictions, no attendance requirements, distance teaching, no time limits on courses, no restrictions on the number of exams taken in a year, no restrictions on subject combinations, credit accumulation, and learner autonomy. The more of these features a system of education incorporates, the more open it is considered to be. It's important to note that correspondence or distance education institutions may or may not be open institutions, and even traditional universities may become open to a certain degree. In order to attract more students, some institutions are incorporating aspects of openness into their programs. It's difficult to determine at what level of openness a university can be considered an "open university", but the relationship between distance education and open education is growing.

Open education can be easily facilitated through the distance education system. The advancements in distance education practice also encourage and promote open education. Distance education provides flexibility and potential which allows educational systems to become open, and open educational systems suit the promotion of distance education. This is why the two concepts go hand in hand so well.

Understand your target group - the learners: This includes their socio-academic background, linguistic abilities, study habits, aspirations, potential for learning, prerequisite knowledge, and other such details. While you may not be able to know everything about each learner, general information can help you reach them more effectively. Learners are typically adults aged 20 years and above from different parts of the country, including metropolitan cities, towns, rural and remote areas. They come from varied social and economic backgrounds and have different experiences, ambitions, and expectations. Despite these differences, they all study the same course materials, making it difficult to decide the level of content or presentation style. To overcome this challenge, course planners should depend on the information available to them about the needs of the target group. This information can help them decide the content and presentation style for the course. Experience gained from classroom teaching can also be useful in writing for distance learners. Course writers with this experience are better equipped to determine the amount of content needed for a particular level and which presentation style would best suit the learners.

Familiar with Syllabus: It's important that the writers who are creating course content are familiar with the syllabus of the course. The syllabus determines the length and scope of the content, and any

deviation from it could cause issues for both the university and the learners. Therefore, it's necessary that the writer thoroughly analyzes the syllabus before beginning to write. It's essential to have a proper understanding of the course-related factors to help you create effective content. You can refer to the aims and objectives of the course, as defined by the expert committee. It's also important to understand the level of the course within the syllabus. Our experience shows that meeting in person for a day or two with all the course writers helps to address these issues and orient them to write for distance learners. The most important thing is to come to a common understanding about the program and the learners' requirements. This is possible after a thorough discussion between the course writers, the distance education program team, and the experts.

4.3 Credit System

Let's take a closer look at the concept of "credit" based on our course materials. In our system, a course is made up of several blocks, each containing about 40-60 printed pages that cover a specific theme within the course. Every block comes with some in-text/self-assessment questions and an assignment. Typically, one block of standard length, along with its accompanying materials and academic tasks, requires 25 hours of study time. Although there may be some minor differences, generally, completion of one block equates to one credit. For instance, the breakdown could be as follows:

- a) 20 hours for studying the 4 units in a particular block @5 hours per unit including work on intext/self-assessment questions.
- b) 3 hours work on the assignment pertaining to this block.
- c) 2 hours work pertaining this particular block, with the academic counsellors at study centers.

If a distance learner completes a block of coursework and all its associated tasks, they will have to dedicate 25 study hours. This equates to one credit for the course.

Understanding the concept of credit can help course writers plan how much content to present in each unit or block.

For example, if a block has four units, each unit should require around 5-6 study hours. If a block has six units, each unit should require an average of 3 1/2 - 4 hours of study.

A clear understanding of the notion of credit can also help course planners and writers make decisions about

- I. the length and design of units in a block,
- II. the nature of tasks in an assignment, and
- III. the amount of academic counseling needed for a course.

4.4 Understanding the concept of Self Learning Material

Open distance education institutions create course materials based on the principles of self-learning materials (SLMs). As a course writer, it is important to ensure that you are following the principles of presentation and structuring the course materials correctly. If you don't have any SLMs, it is recommended that you obtain some specimen learning materials from open universities as samples. In this handbook, we will provide you with an insight into the principles that are used to prepare SLMs.

It is important to note that you can use extracts or quotations from other books or articles while creating your content. Whenever you find good materials, such as content, definitions, charts, diagrams, etc., it

is recommended that you include them in your unit. However, it is crucial to seek written permission from the copyright holder before doing so. This can be done either by the unit writer or by referring the matter to D-CODE for necessary action. It is important to adhere to academic and professional ethics and standards, and this is a significant issue that must not be neglected.

Familiarity with theories of learning

In distance education, students learn through distance teaching techniques. While learners are the best judges of which learning strategies work for them, it is important for course writers to choose the most effective sequence for the unit. Theories of learning can guide course writers in designing learning materials that suit individual learners. As a course writer, you should ensure that your unit provides a suitable learning environment, including practice reinforcement and feedback, to encourage learning. The learning materials should be effective in promoting learning among learners. To achieve this, the following theories of learning can help, and serve as a guide when writing materials for distance learners.

The cognitive theory of learning highlights the need for cognitive structures to change or reorganize. This acquisition and transformation of knowledge leads to changes in knowledge, skills, attitudes, and values.

As a majority of distance learners are adults, they tend to use their prior experiences to develop and construct new knowledge. This process is commonly referred to as 'experiential learning'. In recent years, the concept of experiential learning has greatly influenced distance educators. The underlying idea behind this theory is that every learner possesses some prior knowledge or experience which they utilize in the learning process to gain further knowledge. Some of the features of experiential learning are also applicable to the constructivist theory.

Constructivism is a process in which learners use their previous experiences to construct a new version of reality, which enables them to handle any new experiences in the same field or area.

Behaviorism is a significant theory of learning that highlights the relationship between the stimuli that learners receive and the responses that they display. Behaviorists have contributed greatly to education, particularly distance education, by defining objectives in behavioral terms.

Familiarity with D-CODE policy on payment, copyright and related issues

Writing a unit for D-CODE or any other open/distance education institution is a paid job. If you are asked to write a unit/block, you will receive a fixed payment amount. It is important to note that:

- You have been hired to write a self-learning unit, rather than a lecture or an article. Therefore, it is expected that you follow the characteristics and principles of writing self-learning materials, which can be found on pages 9 and 10.
- The copyright of the unit you write will belong to the university. However, you will be credited for your contribution to the course materials.
- The content Editor has the authority to modify the content, presentation, and structure of the unit based on its quality. If the Editor deems the unit unsuitable for any reason, it may be replaced. Nonetheless, you will still receive payment for writing the unit.
- Every block of each course produced by D-CODE will include a credit page on page 2. This credit page will list the names of the members of the Programme Expert Committee, Course Preparation Team/Course Contributors, Production Team, and copyright details. As a policy, no block will be printed at D-CODE without a credit page.

5. DEVELOPING A UNIT

The primary mode of teaching in distance education is through printed course material. Even in developed countries with advanced Open Universities and revolutionary changes in educational systems through mass communication media and information technologies, printed course materials remain the most crucial means of instruction for thousands of learners at a distance. Therefore, it is necessary to ensure academic standards are maintained while preparing the course material.

Course writing is a crucial aspect of academic programmes offered by distance education institutions. The course material should be designed in a way that promotes self-learning, enabling the learner to acquire knowledge with or without the support of a teacher. In simpler terms, the course material should be designed to include the teacher's guidance. Now, consider this question: can we actually incorporate the teacher's guidance into the course material? Reflect on this question while going through the following sections. Ultimately, the course material should be self-contained.

When developing and presenting a self-learning unit, the course writers should be aware of the various strategies that are available to present the subject matter effectively. To ensure that distance learners receive the same benefits as those in a physical classroom, the self-learning materials should include study guidance, reinforcement, and feedback. These materials should provide essential functions that a teacher would typically offer, as they are designed to assist and encourage the student who is not physically present in the classroom.

There are many ways of presenting the content, but the features that we discuss here are common to all the courses at D-CODE. Broadly, there are three parts of a unit – beginning of the unit, the main body of the unit, and the ending. We shall describe each part in some detail.

Each unit is assigned a title that accurately reflects the content covered in the unit, ensuring that learners are provided with a clear understanding of the material presented.

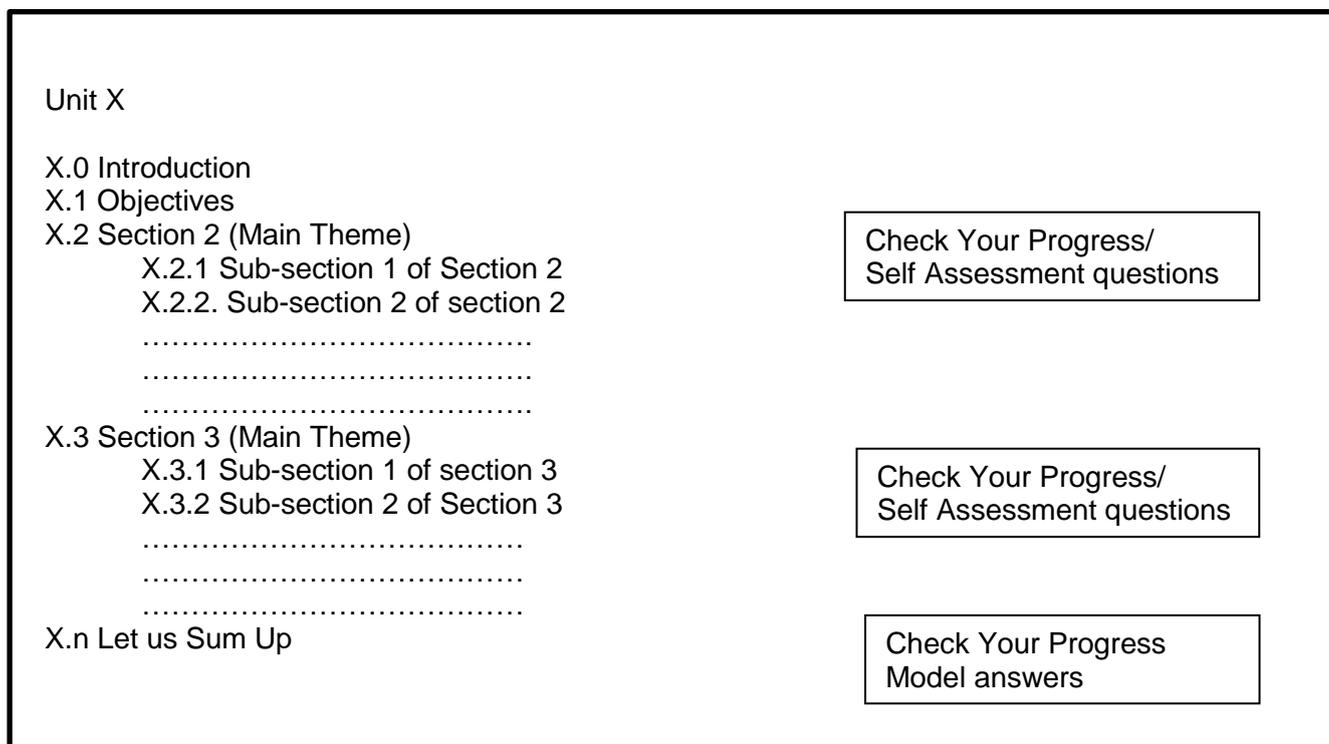
5.1 Beginning the Unit

This is the first section of the unit. Its purpose is to provide clear guidance to the learners on how to approach the unit and what to expect from it. The beginning of a unit comprises the following components:

- i. **Structure of Unit:** In order to make study materials more accessible for self-learning, it's recommended to present a list of teaching items at the beginning of each unit. This list helps distance learners to understand what makes up the unit. While a textbook usually only has one table of contents for the entire book, distance teaching materials should have a list of items for each unit. This list of learning items is called the 'structure' of the unit, which is a detailed breakdown of the content into sections and subsections. The structure displays the relationships within the content and helps learners to effectively locate relevant parts. While the term 'contents' can be used to refer to this list, we prefer to use the term 'structure' as it is more meaningful in a pedagogical context.

When dividing a unit into sections and sub-sections, it's important to number them in a clear and simple way. The main goal of the numbering system should be to make the content more accessible, rather than make it more difficult to understand.

It is important to note that we do not use numbering beyond two points. If you believe that specific parts of a subsection are important and should be included in the structure, you may place them within the subsection without allotting any numbers to them. Instead, you can highlight them using bold typeface. To better understand the structure of a unit, please refer to the following example:



Example 2: A schematic representation of the design of Units

The sections and sub-sections should have clear and relevant titles. Some more examples are as follows:

UNIT 1 COURSE DESIGN
Contents
1.0 Objectives
1.1 Introduction
1.2 Developing a Curriculum
1.2.1 Teaching the hidden curriculum
1.2.2 The nature of the students
1.2.3 National Considerations
1.2.4 Content and methods
1.3 Assessing Educational Needs
1.3.1 The characteristics of adult learners
1.3.2 Assessment of specific needs
1.4 The process of Curriculum Planning
1.5 The Systems Approach to Course Planning
1.5.1 Educational needs
1.5.2 Defining objectives
1.5.3 Resources and constraints
1.5.4 Selection criteria
1.5.5 Alternative methods of meeting objectives
1.5.6 Alternative subject matter
1.5.7 Choice of method
1.6 Making a Course Outline
1.7 Problems in Course Planning
1.8 Let us Sum Up

ii) Introduction to the Unit: The introduction section of a particular unit should provide a brief overview of the content being discussed. It should also connect the unit with the existing knowledge of the learners to help them start their study effectively. The introduction must be concise enough to provide adequate help to the learners in the beginning.

Introduction is an essential part of any learning material. It has three major components that should be included to make it effective. These components are as follows:

a) **'Structural' component:** In this component, we provide information about the previous content that the learner has already studied. This helps to establish a connection between the learner's previous knowledge and what they are going to learn in the current unit.

b) **'Thematic' component:** This component provides an overview of the main concepts that will be discussed in the unit. Its purpose is to grab the learner's attention and focus it on the content of the unit. It is best to talk informally about the theme of the unit and mention what content is planned to be included in it.

c) **'Guidance' component:** In this component, we provide study guidance to the learners. This includes information on what the learners need to do before starting the unit, such as acquiring new knowledge, time requirements, special activities, references, equipment, books, etc. It is important to inform the learners about everything that they need to get the best out of the unit.

To encourage students to actively participate in learning, we can assign some practical activities at the beginning of the unit, if necessary. The introductory section is crucial as it sets the foundation for the entire unit and establishes connections with previous units. It may be written after the unit is complete. When writing the introduction, course authors should avoid making it too lengthy or too brief. Typically, the introduction should be around a page long.

iii) Defining objectives: The statement of objectives is a crucial component of distance education materials. By objectives, we mean the specific skills or abilities that a learner should be able to demonstrate after completing the unit that they were not able to do or struggled with before (Rowntree, 1986). It is important to understand that objectives are different from aims. Aims are what a teacher intends to accomplish through their teaching, while objectives are the behaviors that learners are expected to exhibit. Objectives are derived from aims, but they are distinct in that they are focused on the learner's achievements. We will discuss objectives in more detail below.

When defining objectives, educators should identify the measurable outcomes of instruction in observable terms. These outcomes are often referred to as "**learning outcomes.**"

It is crucial to have a clear definition of the objectives for each unit. By doing so, it becomes possible to plan, evaluate, and modify any teaching activity until the desired results are achieved. As distance educators, if we are unable to reach the objectives, or if we believe that they are unattainable, we must re-evaluate and modify the objectives themselves or change the instructional strategy until we achieve the desired results.

Expressing objectives in behavioural terms has several advantages. There are four main reasons for carefully wording statements of objectives in this manner.

- Firstly, objectives provide guidance in planning the instruction and the unit. Course writers should determine at the outset what a learner will be able to do after completing the course/unit or a part of it.
- Secondly, objectives help in deciding assessment techniques, such as constructing a test and evaluation schemes. Ambiguous objectives make it difficult or even impossible to prepare effective test items.
- Thirdly, learners can know what they must learn or achieve in a particular unit, allowing them to plan their study schedule accordingly.
- Finally, objectives help learners assess and measure their own progress from time to time during the study of the unit.

Components of a complete statement of objectives (in behavioural terms):

- **Condition, i.e. situation:** a behaviour can be displayed under certain conditions. Therefore, when stating the objectives, we need to specify the condition under which the learner should display the desired behaviour. For instance, "After watching the video program, the learner will be able to...", "After attending the workshop, the participants will be able to explain the concept of distance education", or "After 5 months of practice, you will be able to type 30 words per minute." These conditions are necessary to reach the expected level of objectives. Therefore, a statement of objectives should always start with a condition/situation.
- **Behaviour, i.e., action:** an objective in behavioural terms indicates what behaviour a learner should display after going through the unit. For example, "The learner will be able to distinguish between living and non-living things." Here, the learner will display his/her behaviour by listing out the differences between living and non-living things.
- **Standard, i.e. level:** When stating objectives, it's important to establish the expected behaviours and performance level that learners should aim for. For instance, if we say that "after completing this unit, you will be able to explain four properties of magnets," the word "four" sets the standard level for learners' performance. They should aim to achieve this level of objectives. The standard of objectives depends on the level of learners the material is intended for and what we want them to accomplish. If we are writing for undergraduate level students, the objectives should be focused on knowledge, understanding, and application. However, for postgraduate and higher-level students, objectives should go beyond application and focus on synthesis and evaluation.

OBJECTIVE

In this unit, we will teach you the principles of planning and designing a course that is suitable for distance education. We will begin by making comparisons between conventional and distance education, and then we will discuss some techniques that distance educators have adopted to aid with research and planning.

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

- Explain how and why the curriculum for distance education may differ from that used in conventional education.
- Describe methods of assessing educational needs and explain why it is important to carry out such an assessment.
- Describe and discuss the process of curriculum planning for distance education.
- Describe the systems approach to course planning and explain each stage.
- Use this approach to develop a course outline.
- Describe and discuss problems that are commonly encountered during the course planning process.

Example 4: Objectives

5.2 Main body of the unit

The unit's main body is organized into sections and subsections, each containing a new point or idea, accompanied by self-check questions.

As a course writer, it is important that each section of the course relates to a specific objective. The purpose of each section is to present subject matter, themes, or topics, and to provide learners with self-assessment questions that will help them gauge their understanding of the material. The main body of the unit should consist of a series of materials that explain each topic, along with corresponding self-assessment questions, exercises, or activities.

As most units require several hours of study, learners cannot work through them in one sitting. Therefore, dividing the material into suitable sections and subsections provides learners with stopping places. Clear organization is imperative.

It is important to use clear and consistent structure when creating learning materials that include self-assessment questions, activities, and exercises. This makes it easier for learners to navigate through the material and use it in the way that best suits their needs. It is important to include headings, boxes, or other signs to indicate changes in content so that learners can easily distinguish between the different sections. Not every learner will read every word of the material, and some learners may want to go through the material multiple times. By using a consistent structure, learners will be able to get the most out of the material in a way that works best for them.

The following example explains where the main body of a unit begins:

UNIT 4 ORGANISING THE PRESENTATION

Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Presentation and Motivation
- 4.3 Legibility
 - 4.3.1 The type
 - 4.3.2 Arranging the type
 - 4.3.3 Paper size
 - 4.3.4 Paper colour and quality
- 4.4 Legible Graphics
 - 4.4.1 Illustrations
 - 4.4.2 Diagrams and charts
- 4.5 Attractiveness
- 4.6 Accessibility
 - 4.6.1 Structural devices
 - 4.6.2 Access symbols
 - 4.6.3 The importance of access structures
- 4.7 Let Us Sum Up.

4.0 INTRODUCTION

Learning from reading a text is not easy. The reader must put considerable effort into the task. But that is not all; the quality of the text itself is also important. Some texts are more effective teachers than others. There are three categories of factors which contribute to effectiveness; the presentation of the content, the level and clarity of language, and the format to the text. In other words, the meaning must be clear, the language simple and the text itself well presented. It is difficult to estimate how much importance to attribute to each of these factors, but it appears that the third factor, the subject of this Unit, is as important as the other two. In this Unit we shall consider why this is so.

4.1 OBJECTIVES

This Unit will help you to understand the importance of presentation and design in distance learning texts.

At the end of the Unit, you should be able to:

- discuss the relationship between presentation and motivation in distance education;
- describe factors which contribute to the legibility of texts;
- describe factors which contribute to the attractiveness of texts;
- describe features which make texts usable and accessible, and explain why they are important for developing study skills.

4.2 PRESENTATION AND MOTIVATION

To what extent does the appearance of a text matter? It may give us pleasure to possess an attractive book, but is it of any educational importance whether or not a book is good to look at? We can answer this question both in the affirmative and negative.

If a student is very highly motivated, he/she will learn even from poorly produced materials. There have been cases where distance students have accepted hand written duplicated notes. Many correspondence courses consist of badly-typed, densely packed pages with thin rough paper and a proportion of students will always study successfully even with such materials.

Example 5: Body of a Unit

There are various approaches to conveying information, differing depending on the teacher, subject matter, and whether the instruction is delivered in-person or remotely. The primary objective, however, should always be to ensure that learners can comprehend the material with ease. In this discussion, we will explore the format utilized at D-CODE.

Concept mapping

Before starting to write a unit, it is important to have a clear concept of its content as a whole. This can be achieved through a process called 'concept-mapping', which involves developing a detailed structure for the unit. To do this, it is necessary to understand the philosophy behind the course structure and determine the appropriate sequence for presenting the subject matter to suit the learning process. A unit writer should have a thorough understanding of the subject matter to be presented in the unit to accomplish this effectively.

In order to write a unit, the writer must first create a few concept maps related to the theme they are working on. Once the concept maps are prepared, the writer can then select the best one to use. You may be wondering how to create multiple concept maps on the same theme. If you have experience with teaching, you know that every time you present a topic, your presentation style and the examples you use may differ. This means that it is possible to develop more than one concept map on the same theme. Experienced teachers should be able to do this quickly. Each theme consists of a few sub-themes, and each sub-theme will have its own section within the unit. The sections are indicated by two digits with a point in between, such as 3.2 or 3.3.

Concept map

1. Earth: surface as we know it
 - 1.1 Land
 - 1.2 Inside the earth
 - Lithosphere – Crust–
mantle-core
 - 1.3 Outside the earth
 - Hydrosphere –
Atmosphere, Biosphere
2. The system Earth belongs to
 - 2.1 Planets, comets
 - 2.2 The Sun-solar system
3. The system, the Solar system belongs to
 - 3.1 Milky way
 - 3.2 Galaxy – types, etc.
4. The system galaxies belong to
 - 4.1 Universe
 - 4.2 Size of Universe (Light Year)
5. How was the Universe created
 - 5.1 Theory 1
 - 5.2 Theory 2

Example 6: Example of concept map

Having thus, decided on the outline of the Unit, the course writer needs to be aware of the following seven considerations:

- i) Small steps
- ii) Logical arrangement
- iii) Ordering the content
- iv) Personalized style
- v) Language
- vi) Illustrations
- vii) Assessment

- i) **Small steps:** It is best to divide the content into small and manageable learning activities or steps, and organize each activity under a section or sub-section. This allows the learner to move through the material point-by-point.

To transition from a teacher-centered to a learner-centered education, it is essential to break down the content into reasonably small points. This makes it easier for the learner to move from one step to the next.

Some teachers may think that dividing the content into small steps is not possible in their subjects, and others may worry that the flow of content is lost in the process. However, we must prioritize the needs of the learners and present the content in the best possible manner, even if it is challenging from the subject point of view. The learner should be the focus and center of attention.

- ii) **Logical arrangement:** The content of the course should be arranged logically in such a way that learners can easily proceed from one learning point to another, similar to climbing stairs. Each learning point should be stated clearly and easily accessible to the learners, and should be linked with the point that follows it. This logical arrangement will help to maintain both the continuity and consistency of the presented information. It is important to note that if the course writer is not clear about what they want to present, it will be difficult for the learner to engage in self-learning.

- iii) **Ordering the content:** Based on educational psychology research, we follow certain principles to order content for optimal learning. These principles include:

- a. **From known to unknown:** Each unit should be connected to the prior knowledge or the existing behaviour of the learners. This helps in making the new knowledge meaningful and easy to understand as it is related to their previous experiences and surroundings.
- b. **From simple to complex:** To create interest and motivation in learners, the unit should start with relatively easy ideas or concepts and gradually move towards more complex ones. The simplicity and complexity of the concepts should be judged from the learners' point of view. The course writer should aim to establish a level of understanding that would be easily comprehensible to the learners. It is important to remember that the material is meant for learners who may have less prior knowledge and experience in the subject.
- c. **From concrete to abstract:** To facilitate understanding, it's best to start with concrete materials and gradually introduces the abstractions. We can use illustrations, experiments, demonstrations, and other similar techniques to get started.
- d. **From particular to general:** Moreover, when discussing a particular concept, it's better to generalize it after discussing a few particular cases. This method is suitable to explain specific traits or characteristics of a group or society in social sciences. In this method, particular examples and illustrations precede generalization, where the particular is concrete and the general is abstract. However, in some cases, we may reverse the process.
- e. **From actual to representative:** When it comes to learning, it is always more effective to have hands-on experience with actual objects and events. Therefore, learners should

be encouraged to engage in activities or experiments that are related to the subject matter. It is important to present them with actual problems and encourage them to solve them. However, when it is not possible to expose them to real events or objects, representative forms such as charts, graphs, diagrams, etc. can be used to make the content more comprehensible for self-learning. This is especially crucial in the teaching of science and related subjects.

- iv) **Personalized style:** In open distance education, the learner is an active partner in the process. They read attentively, so we should be sympathetic and generous in explaining content. We use 'you' to speak directly to them and 'we' to refer to ourselves. Our goal is to create a conversation between teacher and learner through personal, interactive writing. This style captures and sustains their attention.

It is important to be mindful of our writing when catering to distance learners who we do not personally know. Our tone should be friendly and conversational, while still showing respect for both the learners and the subject matter. However, it is possible to go overboard with a personalized and conversational style, making the material seem more like a letter between a teacher and a student rather than self-learning material. Therefore, it is crucial to maintain a balance and exercise caution when using a personalized and conversational tone.

- v) **Language:** Distance education relies heavily on pre-produced printed materials, which are supported by additional mass media. The effectiveness of distance learning materials depends largely on the quality of language used.

Course writers should always keep in mind that using simple and clear language is essential for effective communication. However, some writers tend to use complex words and write in a convoluted style, which makes it difficult for learners to comprehend the message.

When creating self-learning material, it is important to engage learners by encouraging them to read, participate, and interact with the material. To achieve this, it is crucial to write in a language that is easily understandable by learners. This is especially important for distance learning, where clear, concise, and direct communication is vital.

When creating SLMs, it's important to consider language and its various components such as sentence structure, vocabulary, and style. Your writing should employ simple, plain, and clear language. This means using straightforward and unambiguous language that conveys the message without making the learners struggle to comprehend the meaning of words and phrases. If the learners are frequently consulting the dictionary, it could be a sign that you're using too many unfamiliar and difficult words in your unit.

a. **Sentences:** Communicate directly by using short, simple sentences. Lengthy sentences should be broken down into smaller ones.

b. **Vocabulary:** Some teachers mistakenly believe that using difficult words makes them appear more scholarly. They also assume that the less people understand their language, the more scholarly they are. However, when creating SLMs, the purpose is not to showcase one's scholarship but to ensure that learners can easily comprehend and absorb the content presented in a simple and direct language. Using complex words can obscure the meaning and make communication ineffective. It is best to use active vocabulary and simple grammar to make your unit more readable and the presentation lucid.

c. **Paragraphs:** Lengthy passages can spoil the effect. Present one idea in one paragraph for clarity.

d. **Conversational and friendly language:** In distance learning, it is important to use conversational and friendly language to communicate with learners. Writing in a way that mimics speech helps to achieve this goal.

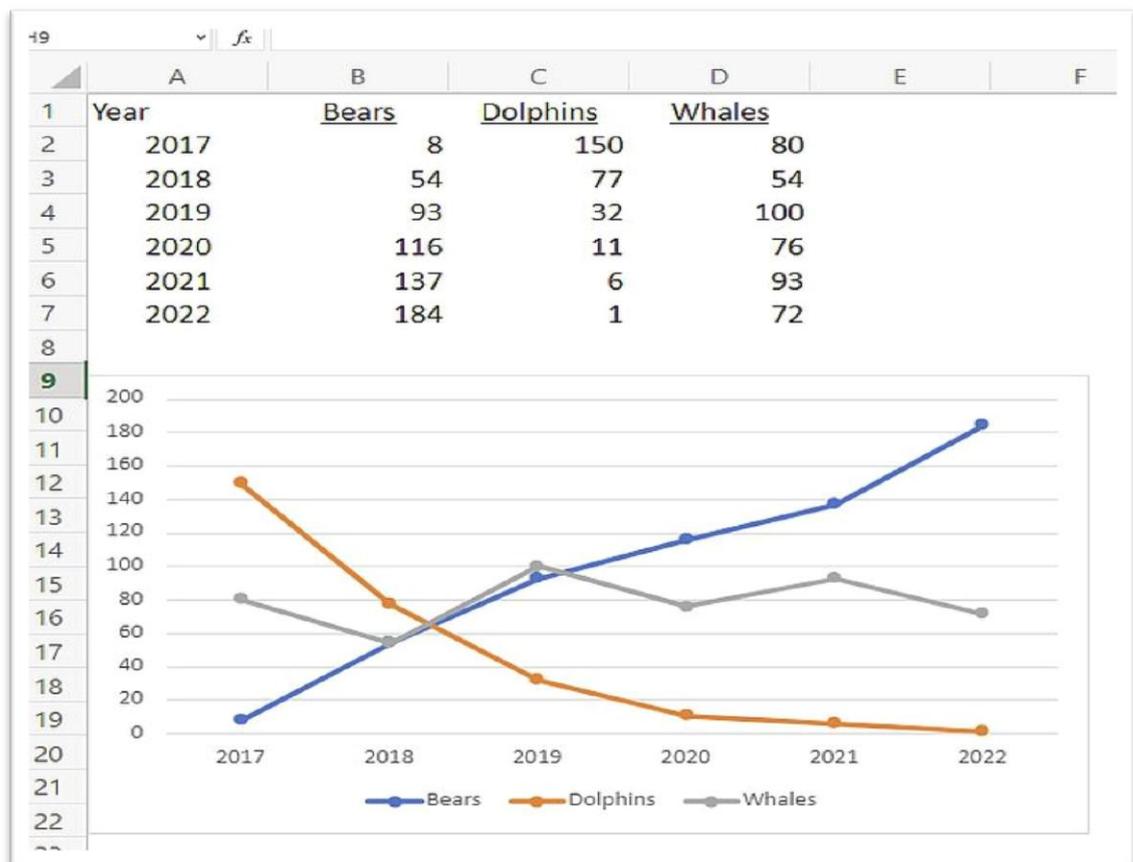
- vi) **Illustration:** Illustrations are used to clarify concepts, abstractions and facts, increasing comprehension and retention.

Illustrations are a means to help learners understand the content, not the end goal. They should not overshadow the content of the lesson. Therefore, we should avoid using too many illustrations as they can distract the learners' attention. Instead, we should carefully select illustrations based on their need and cost-effectiveness. The illustrations should be simple, self-explanatory, and directly related to the content of the lesson. They should be

familiar and easily recognizable for learners to identify the objects in the picture. In other words, illustrations should be educational. To be effective, they should be presented in various formats and not in a dull and monotonous manner.

Illustrations should be considered as a means to an end, rather than an end in themselves. There are various types of illustrations, including photographs, line drawings, diagrams, graphs, flow charts, maps, cartoons, and more. It's not common to use photographs in self-learning materials because reproducing them can be quite expensive. Instead, line drawings, diagrams, graphs, and other similar types of illustrations are used as they are more cost-effective and readily available.

Some examples of illustrations are given below



Example7: illustration as graph

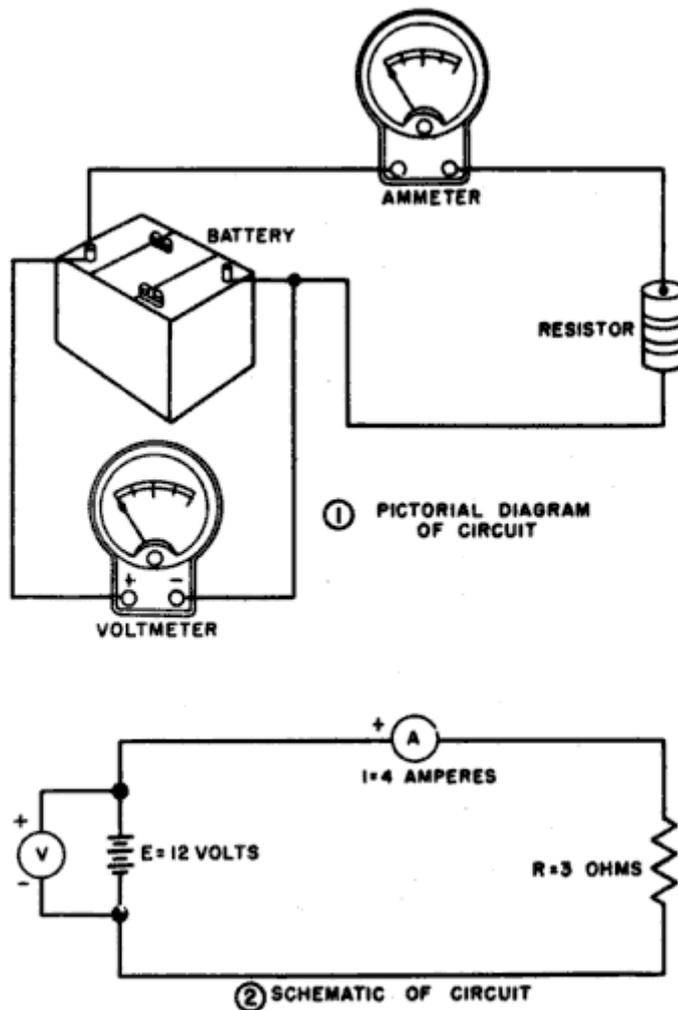


Figure 48. Diagram of a basic circuit.

Example8. Line diagram as illustrations

- VII) Assessment:** One of the crucial responsibilities of a course writer is to create assessment items that help determine if the objectives outlined at the start of the unit are being met. It's important to understand the significance of assessment in distance education. Typically, in self-learning materials, we utilize at least two types of assessment.
- Self-check questions, check your progress questions, exercises, activities and assignment questions come under the first category of assessment. This type of assessment helps learners improve their understanding of the content and provides feedback on their progress.
 - The second type of assessment that exclusively measures the learners' performance is the term-end examination.
- In this handbook, we will be discussing the first type of assessment that is closely related to the role of a course writer. These questions are included within the written material of the units and are referred to as in-text questions. At least three types of questions can be included in this category.
 - **Self-check questions** are an essential aspect of self-learning materials. Sometimes referred to as "check your progress" or "self-assessment" questions, these are questions that learners attempt on their own and do not send to the university for assessment. The purpose of these questions is to assist learners in revising information, supporting their learning, and evaluating their own understanding of the content. These questions help

learners receive feedback, assess how much content they have grasped, and help them progress in a step-by-step manner towards the objectives stated at the beginning of the unit. Depending on the functions assigned to these questions, they may be comprehension, recall, inference, or review questions that help learners revisit specific portions of the unit.

It is imperative to include self-assessment questions frequently in distance teaching materials. These questions are usually presented as a separate feature from the main content. This is because the answers to the questions are also provided in the unit, and it is necessary to number both the questions and answers for easy identification. However, it is important to ensure that the questions and material are interwoven in such a way that they constantly move the learner forward, without functioning as a hindrance or check-post. Although we can describe the unit as a series of steps, they are small and easily manageable steps, akin to a moving staircase rather than a ladder.

Type of self assessment question: As a course writer for distance education, one of the frequently faced questions is what type of self-assessment questions to use and how often they should be included in the material. There isn't a set formula for this, as writers are free to choose any type of questions, such as objective type, multiple choice, matching, very short answer, etc., depending on the context and suitability of the questions. When framing a question, it's important to ensure that the learner spends a minimum amount of time on it, usually between 1 to 3 minutes. If it takes longer, it may become a deviation or distraction from the study, causing the learner to lose rhythm.

The frequency of self-assessment questions is subjective and depends on the writer's judgment. Typically, one or two questions per section of the unit may be given, based on the objectives set for that section. For longer sections with more than two objectives, additional SAQs may be added.

Model Answers: It is important to provide model or possible answers for all self-check questions. These answers serve as feedback and can also be a part of the learning process. The course writers should get into the habit of creating answers immediately after writing the questions.

The answers should be placed at the end of the unit, but not easily visible to prevent learners from cheating.

It is essential to note that the model answers may not always be the best answer, but they should guide learners to the right approach. While creating model answers, course writers should ensure that they are based on the materials taught in the unit and not outside the scope of the course.

- **Activities:** Activities serve important pedagogic purposes, similar to self-check questions. They provide learners with the opportunity to practically apply knowledge gained through print materials. The term "activity" refers to something that needs to be done practically. Activities are a pedagogical diversion that helps learners relate the material to practical experience. They are longer and open-ended, designed to encourage learners to apply their knowledge. In some cases, activities may not require model answers. Activities are particularly helpful in science subjects or any subject where learners need to apply the knowledge they have gained. It's important to note that an activity is not a project; learners should spend a maximum of 8-12 minutes on an activity before returning to their studies. Activities should not require a large amount of time, energy, or money. For instance, example-11 taken from a biology unit gives an idea of the type of activities that can be included in the unit.

- b. **Project type questions** require learners to work on a brief project, such as collecting data, analyzing it, and presenting inferences based on the data.
- c. **Practical questions** are based on the practical application of the knowledge gained after going through the materials. These questions may offer an internal choice or option for learners to choose from.
- ii) **Short Answer Question:** The questions included in this category have a narrower scope than essay questions, yet they can still cover a significant amount of material.
- iii) **Objective type question:** Various objective-type questions, such as true/false, filling in the blanks, multiple choice, yes/no, one-word answers, and very short questions, can be included in an assignment. These questions can be graded by a computer and are not prone to any biases. They are particularly useful for testing factual knowledge, understanding, and application of a concept.

There are two types of assignments based on assessment: **Teacher-Marked assignments (TMA)** and **Computer-Marked Assignments (CMA)**. Teacher-marked assignments are subjective assignments that are assessed by the teacher, while computer-marked assignments are objective assignments that are assessed by the computer.

5.3 Ending of the Unit

The final section of a learning unit is a recap of the topics covered throughout the unit. It serves to help learners ensure that they have completed all necessary learning activities, fully comprehended the content, and assimilated all key points. The concluding part of a unit generally consists of the following components:

- i) **Summary:** After discussing the content in detail, it is important to summarize the important points. The summary will provide feedback to the learners, helping them recall the key takeaways from the unit. You may recall your student days when your teachers used to summarize their presentation at the end of the lecture or class. There are two main purposes for summarizing the unit, which are to recapitulate and reinforce the content.
 - a. **Recapitulation:** The unit summary helps learners recapitulate important points and retain information.
 - b. **Reinforcement:** Upon summarizing the unit, learners feel motivated to continue learning and confident in their ability to manage their own learning without external assistance.

A summary of a unit can be presented in various forms, such as a checklist or a list of key points covered.

- ii) **Glossary:** The glossary is a helpful tool that aids learners in understanding the concepts discussed in the material. It serves to refresh and clarify their comprehension. It's worth noting that while the inclusion of a glossary is beneficial, it's not mandatory. The decision to include a glossary should be based on the nature and demand of the content being discussed.
- iii) **Suggested/Useful Books:** Many courses require students to read additional material in addition to the course units. Sometimes this extra material is essential, while on other occasions it may be entirely optional. When suggesting additional books, the following criteria should be taken into consideration:
 - a. - Is the book easily available?
 - b. - Is the book relatively cheap?
 - c. - Is the book readable?

The idea is to suggest books that are useful for the learners and are easily available at reasonable prices. The presentation of the content should be simple and readable so that the learners can get more out of these books.

- iv) Model answers/Possible Answers:** It is important to provide answers to all the self-check questions, exercises, and other activities that are included in the Unit. To make it easier for learners to find the answers, they should be numbered in the same way as the corresponding questions. In some cases, it may be helpful to present both the questions and answers in a different color. This decision can be made by the program team based on their preference, but the format should be consistent across all courses within a program.

A Model structure of SLM is given in Annexure1.

6. Guidelines for preparing E-material

The E-Learning Material at D-CODE is developed as per the four-quadrant approach of the UGC (Credit Framework for online learning courses through SWAYAM) Regulations, 2016.

This approach takes into consideration the following four quadrants:

- (i) **Quadrant-I, the e-Tutorial**, is a dynamic learning tool that features organized
 - a. video and audio content,
 - b. animations, simulations,
 - c. virtual labs,
 - d. video demonstrations, and more.It also includes transcriptions of the video. This interactive format is designed to enhance learner engagement and understanding.
- (ii) **Quadrant-II is e-content**, which should include
 - a. self-instructional material,
 - b. e-books,
 - c. illustrations,
 - d. case studies,
 - e. presentations, and
 - f. other web resources such as
 - i. further references,
 - ii. related links,
 - iii. open-source content on the internet,
 - iv. video,
 - v. research papers and journals,
 - vi. anecdotal information,
 - vii. historical development of the subject, articles, etc.
- (iii) **Quadrant-III is the discussion forum**, which plays a pivotal role in fostering a supportive learning community. Here, learners can raise doubts and receive clarifications in near real-time from the Course Coordinator or their team, promoting collaborative learning.

- (iv) **Quadrant-IV is assessment**, which should contain problems and solutions that could be
- a. multiple-choice questions,
 - b. fill-in-the-blanks,
 - c. matching questions,
 - d. short answer questions,
 - e. long answer questions,
 - f. quizzes,
 - g. assignments and solutions,
 - h. discussion forum topics and setting up the FAQs, and clarifications on general misconceptions, and
 - i. Term end Examination

7. Platform for delivering E-material

DCODE will be delivering the E-learning material on ‘**Swayam-2**’ Platform as its LMS which will be maintained by the respective

- Program Co-ordinators and
- Course Co-ordinators.

Annexure I: Procedure for writing SLM

- On First page** : Description of Block (*Sample enclosed below*)
On Second Page : Content of Block (*Description of Unit – Sample enclosed below*)
On third Page : **Unit I** (along with Name of Unit-*Sample enclosed below*)

Structure

- 1.1.
 - 1.2.
 - 1.3.
 - 1.4.
 - 1.5.
 - 1.6.
 - 1.7.
 - 1.8.
-

1.1. Introduction (**Mandatory**)

-----Objectives (**Mandatory**)

After reading this unit you will be able to:

- ❖
- ❖
- ❖
- ❖

1.2. Heading (*Sample enclosed below*)

- 1.2.1
- 1.2.2
- 1.2.3

1.3. Heading (*Sample enclosed below*)

1.4. Heading (*Sample enclosed below*)

- 1.4.1

1.4.2

1.4.3

1.5. Heading (*Sample enclosed below*)

1.6. Summary (Mandatory)

1.7. Self-Assessment Question (*Sample enclosed below*)

True/False, MCQ, Fill in the blanks, Match the following

1.8. Terminal Question (*Sample enclosed below*)

1. Question

2. Question

3. Question

1.9. Answer (*Sample enclosed below*)

Note:

1. **No. of Heading and sub heading can be decided by author**
2. **Self-Assessment Question** (any combination can be used)

Annexure II: Manual Creating Video Lectures

Expected Outcome

The expected outcome of a video lecture recording in terms of video quality is a clear, engaging, and professionally produced video that effectively communicates the content of the lecture to the intended audience. Following quality parameters should be kept in mind and are important for a good video lecture recordings:

1. **Resolution:** Most viewers expect videos to be recorded in at least 720p HD resolution (1280 x 720 pixels) or higher. Higher resolutions like 1080p Full HD (1920 x 1080 pixels) or even 4K (3840 x 2160 pixels) are increasingly common and can provide a clearer, more detailed viewing experience.
2. **Frame Rate:** A standard frame rate for video recordings is typically 24, 30, or 60 frames per second (fps). Higher frame rates can result in smoother motion, which may be desirable for certain types of content, but can also require more processing power and storage space also they are difficult to transmit over the internet.
3. **Clarity and Sharpness:** Viewers expect the video to be clear and sharp, with no blurriness or distortion that could make it difficult to see details or read text.
4. **Color and Contrast:** The video should have accurate color reproduction and appropriate contrast levels to ensure that content is visually engaging and easy to follow.
5. **Audio Quality:** In addition to video quality, audio quality is also important. Viewers should be able to hear the lecturer clearly without distractions such as background noise or audio distortion.

A typical expected video screen is shown in Figure below.



Prerequisites

Before commencing lecture recordings, it's essential to have the following prepared:

1. **Presentation:** The lecture material to be taught should be in the form of presentation and it should be well planned. The slides should be clearly readable and should not be very dense. For this template provided by the University may be used.
2. **Camera:** A decent quality camera, such as a webcam to capture the video. It may be your laptop camera as well.
3. **Microphone:** A high-quality microphone to ensure clear audio. It may be your laptop mic or webcam mic.
4. **Recording Software:** Utilize recording software like Open Broadcast Software (OBS) or PowerPoint's built-in features for capturing video and audio.
5. **Lighting:** Provide adequate lighting to ensure clear and well-lit video of the instructor.
6. **Backdrop:** Maintain a clutter-free and clean background to minimize distractions during the recording.
7. **Storage:** Sufficient storage space for storing the recorded videos.

About the Presentation Template

The University has developed a comprehensive presentation template to ensure consistency and professionalism across all recorded lectures. This template has been meticulously crafted with several key considerations in mind:

1. **Dedicated Space for Instructor's Video Window:** Recognizing the importance of maintaining a clear separation between the instructor's video feed and the content of the slides, the template provides a designated area for the instructor's video window. This ensures that the instructor remains visible to viewers without obstructing the on-screen content.
2. **Maximized Content Space:** Understanding that the primary focus of the lecture is the delivery of content, the template maximizes the available space for presenting information on each slide.
3. **Inclusion of University Details:** Upholding the University's identity standards, the template features University details at the top of each slide. This not only reinforces the institution's image but also provides context and credibility to the lecture content.
4. **Designated Area for Instructor's Name:** To establish the instructor's authority, a specific section is allocated on every slide for displaying the instructor's name. This ensures that viewers are always aware of the individual delivering the lecture.
5. **Comprehensive Information on First Slide:** The first slide serves as a comprehensive introduction to the lecture, incorporating essential details such as the Subject Name, Topic Title, Lecture Number, and Instructor Name. By presenting this information upfront, viewers gain immediate clarity on the lecture's context and relevance.

In light of these considerations, all instructors are strongly encouraged to utilize this standardized template for their lecture recordings whenever possible.

About the Recording Software

Regarding the recording process, instructors have the flexibility to choose from the following options:

1. **OBS (Open Broadcaster Software):** This versatile open source software allows for the recording of lectures with customizable settings, including capturing video from webcam feeds, screen sharing, and audio input. OBS offers a wide range of features and is suitable for creating professional-quality recordings.
2. **PowerPoint's Built-in Feature:** For a more straightforward approach, instructors can utilize PowerPoint's built-in recording feature. This allows for the seamless integration of audio narration with slide presentations, making it an intuitive option for recording lectures. **However, the camera facility is available only with latest version of PowerPoint.**

Instructors are also welcome to explore other recording software options, provided that they adhere to the university's recording standards. **It is essential to note that all video lectures must be saved in MP4 format, ensuring compatibility across different platforms and devices. Additionally, the presentation slides should maintain a 16:9 aspect ratio, aligning with the university's standardized template.**

1. Lecture recording Using OBS:

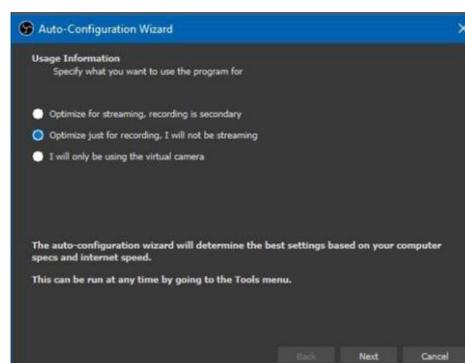
What is OBS Studio:

Open Broadcaster Software or OBS is a free, open-source software for video recording and video streaming. It can be used to capture your screen and /or PowerPoint presentations and record it as a video or stream it live to the audience. It is thus a useful tool for preparing short videos for a “flipped classroom” setup. This guideline will cover the steps required to quickly setup OBS Studio to record videos from PowerPoint presentations with a webcam overlay.

Installation of OBS on your computer:

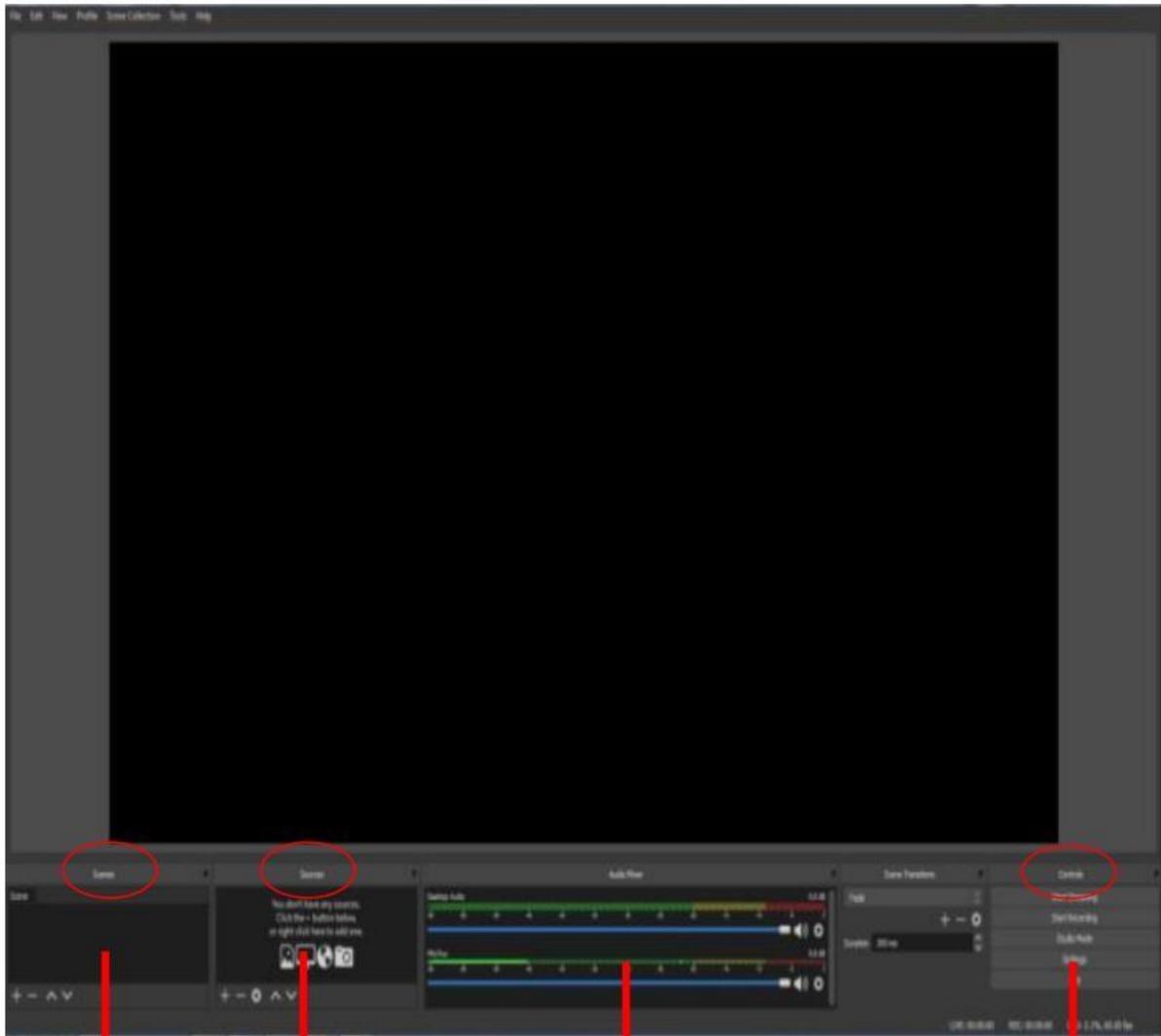
1. Download the program for free on <https://obsproject.com> choose between Windows, MacOS and Linux.
2. Follow the prompts to install.
3. Open OBS.

When launching it for the first time, please select “Optimize just for recording, ...” in the Auto-Configuration Wizard.



Making OBS ready for Recording (One time exercise)

1. When you first open up OBS you will see a screen that looks like the one below. Under the black screen there are five boxes; Scenes, Sources, Mixer Scene Transitions and Controls. For this guideline we will look into three of them (marked out with a red circle).

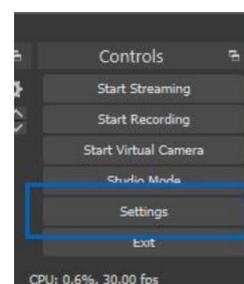


Scene box Sources

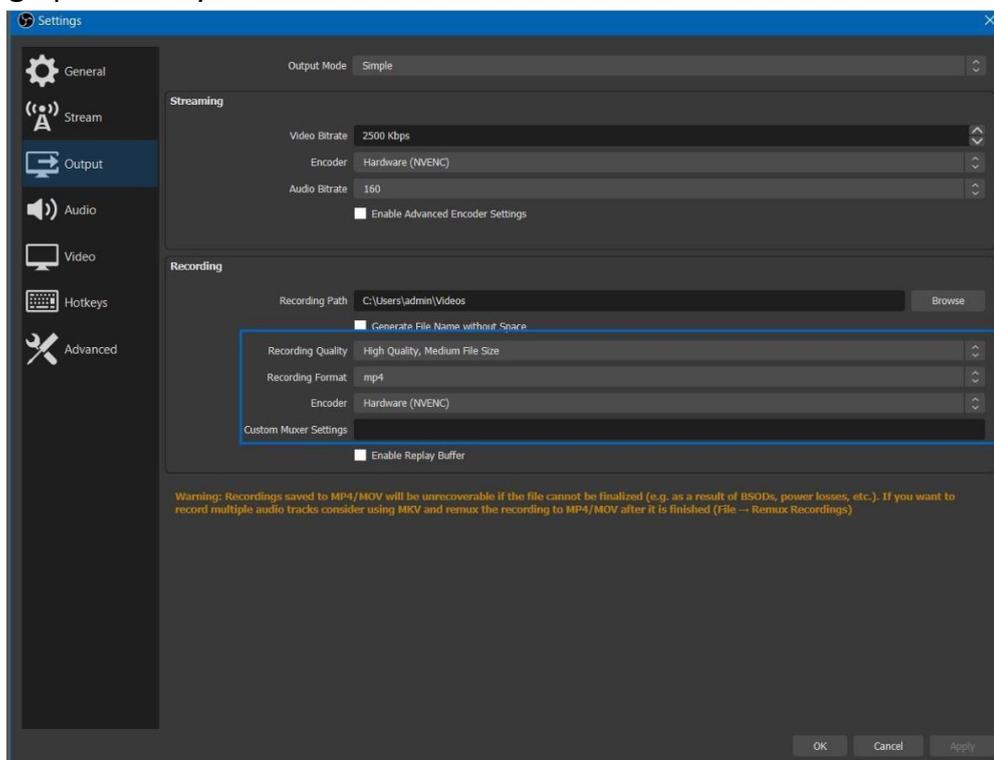
Audio mixer

Control box

2. Afterwards, we should make the “fine tuning” using the “Settings” button, found in the **control box** at the right bottom corner.



3. In the settings menu “**Output**” we can select the **path** (where the recordings will be stored), the quality and the format of the **recording**. We suggest to set “*High Quality with Medium File Size*” while using “**mp4**” file recording format. Advanced users may set further fine tuning options in here, but with the settings provided you can reach excellent results.



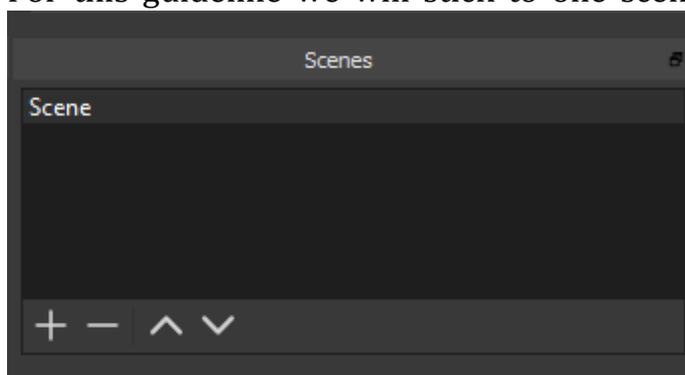
4. Check in section “Audio Mixer” that your headset/mic was detected as source by OBS.

All set and now and we are ready for the recording.

Recording of lecture using OBS:

Step 1: Adding the Scene

When you first launch OBS you will see there is already a scene added in by default. If you would like to create more scenes you can click on the +. For this guideline we will stick to one scene to make it simple.



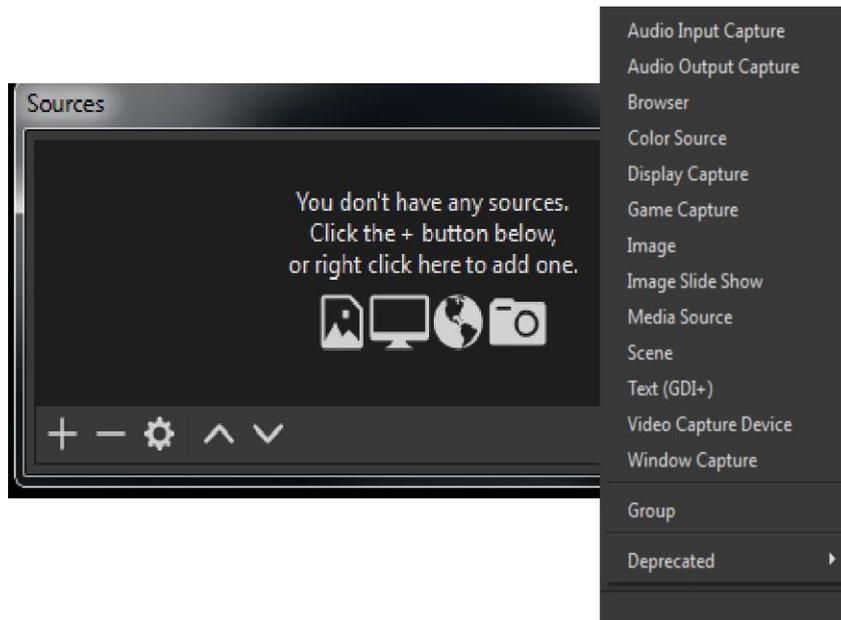
Step 2: Adding the Sources

Before adding any source open your power point presentation and open it in full screen mode by pressing **F5** key.

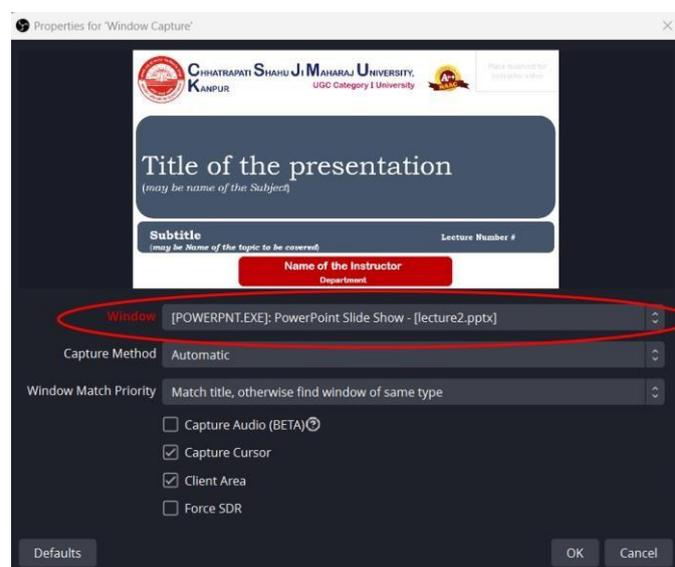
Now switch to OBS studio by pressing **Alt+TAB** key

a) Adding Lecture (PPT) source:

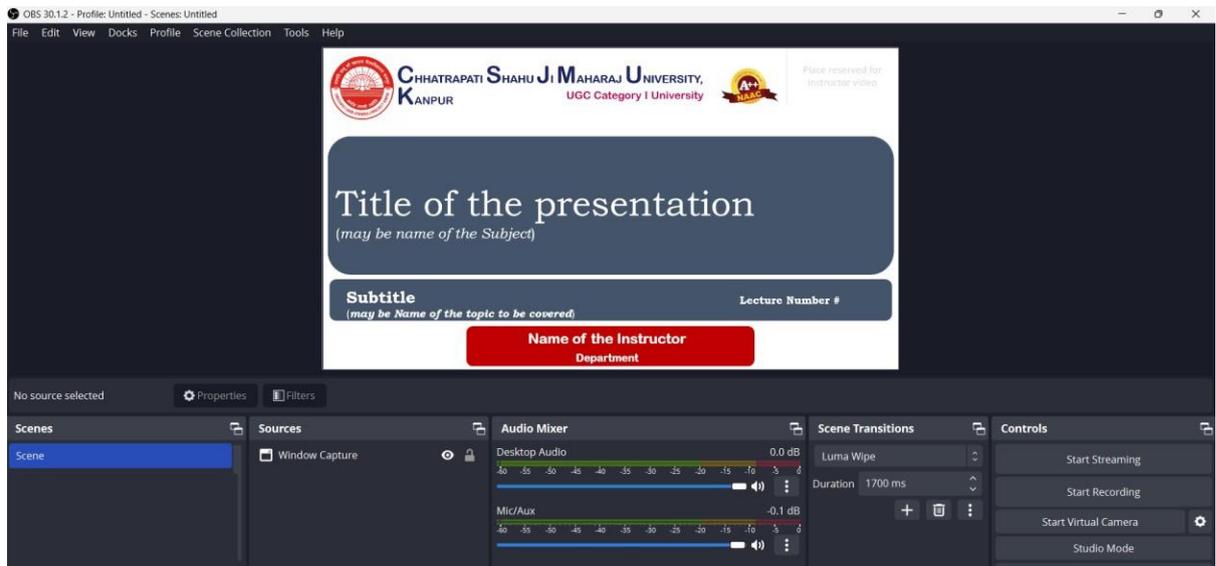
In OBS, to get started capturing, you need to add a Source – see below. Click on the + and pick the source you want.



Select **Window Capture** from the source. It will select the app window, which was chosen as source (In our case it is **POWERPNT.EXE PowerPoint slide show**), is recorded. The moment you select **Window Capture** a pop up will appear and ask for the application window. Do remember to select **POWERPNT.EXE PowerPoint slide show – [your_slide_show_name]**

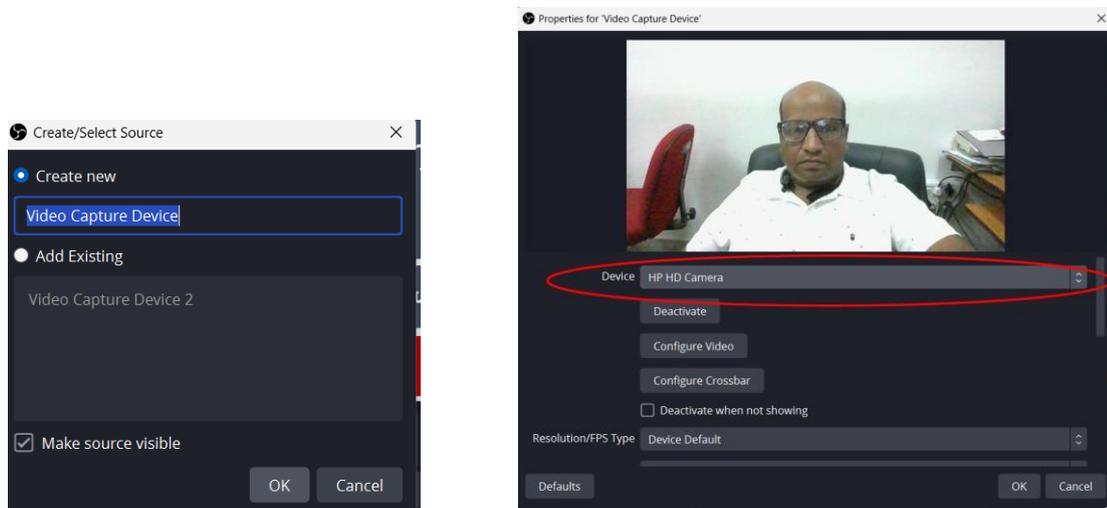


After this you will see the PPT in OBS as shown below

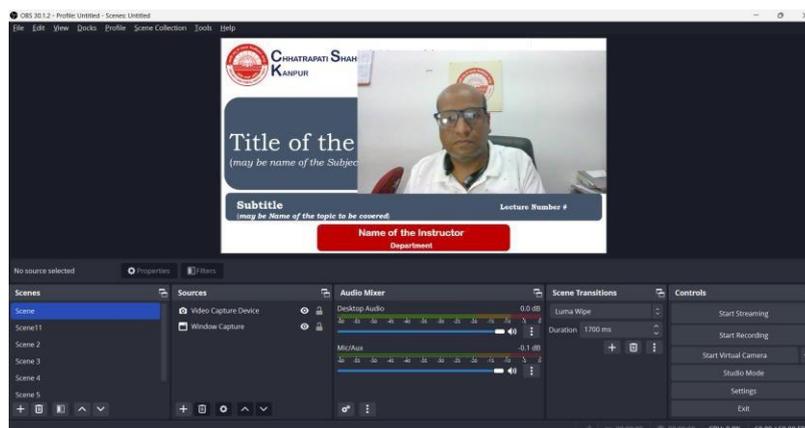


b) Adding Instructor video in source:

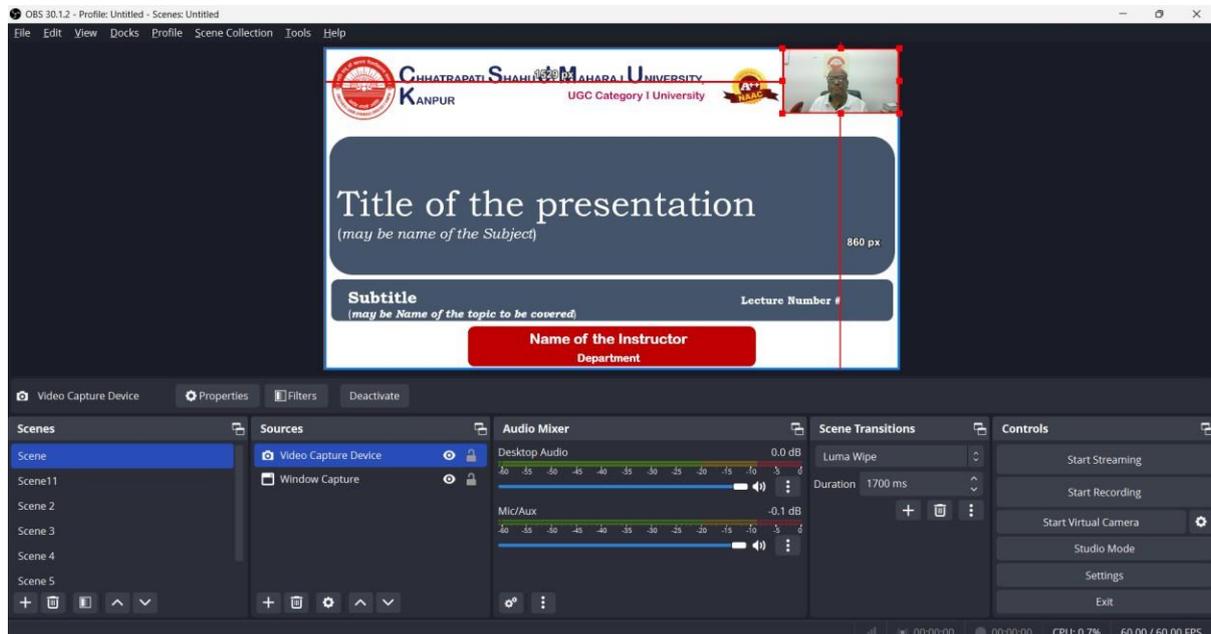
Click on the + in the source and pick the **Video Capture Device** source which is eventually your internal webcam or external camera. It will immediately ask through a pop up window. Press OK and another pop up will come which will ask for the camera device. Choose your camera device as shown below.



After adding this the OBS will look like this



Now you can adjust the size and location of video by simply resizing, dragging and dropping. Resize the video window and place it at the location decided in PowerPoint. Finally it should look like:



Now we are ready for the recording.

Step 3: Recording

a) Press Start Recording in **controls** at the right bottom.



b) Switch to Your Power Point Slide Show by pressing **Alt + Tab** key.

c) Start teaching your lecture in the PowerPoint slide show. Further you can change your slides as well without worrying about OBS. These slides will automatically get changed in the recorded video.

d) After completing your lecture you move back to OBS by pressing **Alt + Tab** key and click the **stop recording** as shown below



Now you can check your recording in the destination folder as set by you at the time of OBS configuration. (by default it is Videos folder of windows)

That's All

Quick Revision for recording with OBS

1. Connect all devices (headset, webcam) before starting OBS.
2. Check in section "Audio Mixer" that your headset/mic was detected as source by OBS. The audio level should be in the yellow range while speaking.
3. Start only the apps which you want to record (close unnecessary ones).
4. Choose "Add" via right mouse key or "+"-symbol in section "Sources" and add "Window Capture" (In pop up select the desired app in the drop- down menu).
5. Add your webcam as source via "Add / Video Capture device" in sources.
6. Adjust the location of webcam (Video Capture Device) by resizing, dragging and dropping.
7. Start recording by pressing **Start Recording** Button
8. Stop recording by pressing **Stop Recording** Button
9. The recording is located as MP4 file in the directory previously defined in the OBS configuration settings.

Lecture recording Using PowerPoint's built in feature:

Please note that Lectures can be recorded with Microsoft PowerPoint 2016 or higher and Microsoft 365 only. This feature is not available with all the versions of PowerPoint.

A good description for creating videos using PowerPoint's built in feature can be downloaded from here:

<https://www.learningenvironments.unsw.edu.au/sites/default/files/default/default/learningenvironments/Create-your-own-Lecture-Recording-using-PowerPoint-William-Armour-UNSW-Engineering.pdf>