The Purpose of Design

The goal of e-learning is to facilitate learning outcomes for a defined audience. Design is a process that aims to link the intended outcomes to the requirements and constraints of the project.

The designer must use learning theory and the different e-learning methodologies (interactive tutorials, drills, simulations, hypermedia, etc) to engage learners in such way that learning takes place in an effective and efficient manner.

The role of a good instructional designer is to structure information so that it can be learned effectively and to design activities that maximize interest, learning and retention.

Audience of Design documents

The aim of instructional design is to structure the learning material so that it leads to the most effective learning by the target audience.

In order for a good design to lead to an appropriately developed instructional program design information should be communicated clearly and effectively to all interested parties. For these reason a set of design documents should be produced. Interested parties may include:

- Client, project manager, content experts, teachers or instructors and learners.
- People involved in implementing the design such as programmers, audio and video engineers, graphic artists, actors, etc.
Design documents and stakeholders

The following are design documents that need to be accessed by the several categories of stakeholders:
- Instructional Designers <= all design documents
- Clients <= Prototypes, storyboards
- Project manager <= Planning document
- Content experts <= Learning material, scripts, storyboards
- Trainers or teachers <= Storyboards, prototypes, scripts
- Learners <= Prototypes
- Production Staff
  - Technical Writers <= Storyboards, scripts
  - Programmers <= Flowcharts, storyboards, prototypes
  - Graphic Artists <= Storyboards, prototypes

Audience of Design documents =>

Phases of Instructional Design

- Instructional design includes the following phases:
  - Development of initial content ideas
  - Task Analysis
  - Concept Analysis
  - Preliminary program description
  - Preparation of a prototype
  - Creation of flowcharts
  - Creation of storyboards
  - Preparation of scripts

Development of initial Content ideas

The aim of this phase is to develop initial ideas of the learning content and how to help people learn it. This is done in a two step process:
- Brainstorming the content and learning approaches
  - Generate information on what information is to be learned using the previously defined goals
  - Generate ideas about how to facilitate learning, using the e-learning methodologies and their respective factors
- Elimination of some initial ideas based on:
  - Characteristics of the learner population. The suitability of ideas are checked against the chart of learner characteristics
  - Relationship of ideas to the Subject Matter and Goals. Individual ideas relate to the subject matter in terms of their chart of learner characteristics
  - Amount of time needed to Learn the Content
  - Restrictions of the delivery system
  - Ability of your production staff

Task and Concept Analysis

- Task analysis is used primarily for analyzing the things a learner must learn to do, such as behaviours and skills.
- Concept analysis is used primarily for analyzing the content itself, the information the learner must understand.
- In some cases we are interested in learners' understanding of a particular content. In this case concept analysis is useful.
- In other cases we are interested with learners' development of specific skills related to using information. In this case task analysis is appropriate.
Task Analysis

- The purpose of task analysis is to distil complex skills into component skills so as to determine an effective learning sequence.
  - A good learning sequence should begin with skills that only require learners' to use and combine skills they already have.
  - The sequence should proceed to combine these new skills to learn more complex ones.
- Task analysis begins with the most superordinate skill, your terminal goal or objective.
  - You break this down into successive subordinate skills
  - You continue the above step until you reach the entry level skills you expect that your learners already possess.
- Producing a flowchart of how the skills will be acquired helps determine a good sequence to facilitate learning.

Concept Analysis

- Concept analysis is mainly used for declarative knowledge such as verbal information, principles and rules.
- Proponents of concept analysis for instructional design argue that although there are many ways of information to be organized, the best way is to view content as concepts and their relationships.
- Learning sequences, under the above assumption, are centered around the learning of important concepts.
- Regardless of how you subdivide and teach a subject, you will invariably encounter concepts the learner must understand.

What is a concept?

- A concept is defined as a group of objects, or relationships that all share a set of common features. Examples of concepts are mammal, telephone, sad, war, work, and cold.
- Each individual member of a class, or concept, has a number of characteristics.
  - Those characteristics that are common to all instances of concept and are essential to be an instance of a concept are called relevant features. The entire set of relevant features is what distinguishes the particular instances of a concept (those things belonging to the class) from the non-instances of a concept (those things not belonging to the class).
  - Instances may of a concept may also have shared characteristics that, although they may be important, are not features that define the concept. These features may be classified as incidental or irrelevant.
- Incidental features of a concept is are those that many and perhaps all instances of concept possess, but which are not necessary.
- Irrelevant features may possessed by instances of a concept, but are neither necessary nor common.
- The presence of many relevant features makes instances of a concept clearer and non-instances less clear.
- The presence of many irrelevant features makes non-instances of a concept clearer and instances less clear.
- The presence of many incidental features tends to make both instances and non instances difficult to classify.
How to do it and use it

- Identify the relevant and incidental features. All other features may be considered irrelevant features.
- Identify a number of instances and a number of non-instances of the concept. Some of these should be clear whereas others should be less clear.
- Produce a learning sequence that follows from it:
  - Tell learners what the relevant features are
  - Sequence examples and non-examples while identifying them as such
  - After the learners can reliably discriminate between clear instances and non-instances introduce unclear instances and the unclear non-instances

Preliminary Program Description

- Preliminary program description includes:
  - Identifying the types of learning within the content. This helps you determine the learning methodologies you will use and other instructional factors that should take into account.
    - The following types of learning have been suggested by the research community: verbal information, intellectual skills, motor skills, attitudes, and cognitive strategies.
  - Choosing learning methodologies. The decision will be a function of:
    - The content ideas previously generated
    - The capabilities or limitations of the delivery system
    - Considerations about learners' levels and motivation
    - The types of learning involved
    - Results of rapid prototyping or initial concept design
  - Sequence description. In this activity you organize ideas to produce a preliminary description of the sequence of the program

Flowcharting

- A flowchart is a pictorial representation depicting the flow of steps in a program, people in an organization, or pages in a presentation.
- In instructional design, flowcharts provide a bird’s-eye view of the structure and sequence of a lesson.
- Elements are represented by simple icons (circles, rectangles, diamonds, or other shapes), with lines and arrows representing connections between events and the direction or order in which they occur.
- A flowchart indicates sequences and decision points as well as starting and stopping points.

Flowchart Conventions

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rounded Box</td>
<td>Represents an event that occurs automatically, triggering a subsequent action.</td>
</tr>
<tr>
<td>Rectangle or Box</td>
<td>Represents an event that is controlled within the process, typically a step or action taken. In most flowcharts this will be the most common symbol.</td>
</tr>
<tr>
<td>Diamond</td>
<td>Represents a decision point in the process, usually requiring a ‘yes’ or ‘no’ response, then branching to different parts of the flowchart.</td>
</tr>
<tr>
<td>Circle</td>
<td>Represents connection with another process. A reference to the new process should appear within the circle.</td>
</tr>
<tr>
<td>Directional Arrow</td>
<td>Indicates direction of flow. Horizontal arrows depict procedures or linear sequence of events, and vertical arrows depict sub- or superordinate skills and knowledge.</td>
</tr>
<tr>
<td>Program Decision</td>
<td>Represents multiple choices for the user, with the chosen option determining the user's path through the remainder of the program.</td>
</tr>
</tbody>
</table>
Flowcharts =>

**Drawing Flowcharts**

- Describe the process to be charted in a one-line statement. Example: "How to fill the car's petrol tank."
- Start with the 'trigger' event that initiates the process. Example: "Low fuel warning light comes on."
- Note each successive action in concise terms, avoiding ambiguous descriptions. Example: "Locate and drive into service station," etc.
- When the flowchart branches into a complex number of options, choose the most important alternative and continue. Additional detail can be provided in other charts without subverting the efficiency of the main idea. Example: "Decision required: Quantity of fuel to be put into tank."
- Make cross references to supporting information. Example: A cross-reference may be made to a list of cars requiring unleaded fuel, a table of preferred brands of fuel.
- Continue describing each event, action, or decision as it occurs in sequence, until the process is concluded (a 'target' point). Example: "Fuel is paid for, tank is filled, customer exits the station."

Flowcharts in Instructional Design

Flowcharts in Virtual School software
Flowcharts: Linear and non-linear navigation

Storyboarding

- Storyboarding provides a rough outline of how the presentation will appear, including a conceptual idea of the location of images and text, related links, and general layout.
- It provides a simple means of creating a visual representation of the user interface developed for each page, illustrating its relationship to the overall scheme.

Linear and Super Storyboards

Who Uses Storyboards?
Storyboards =>

Storyboarding Process: Seven steps

- Write and revise primary text
- Write and revise secondary text
- Produce storyboards
- Check the fit of overlaying displays
- Draw and revise graphic displays and plan other output
- Check graphics and simultaneous text for fit
- Review the flowcharts and storyboards

Example of a Storyboard template