E-Learning Methodologies and Best Practices

A documentation manual for designing and delivering e-learning solutions from UMAMI E-learning Solutions.

umami-learning.com

About this manual

This manual has been developed to provide guidance, examples and good practices for the design and delivery of e-learning solutions, based on the work undertaken by UMAMI E-learning Solutions in supporting the e-Learning environment in the Holding Company for Water and Wastewater (HCWW) as part of the technical assistance provided by USAID under the Integrated Water Solutions Support Technical Assistance (IWSSTA).

OVERVIEW

The purpose of this manual is to provide guidance on designing and developing e-learning-based solutions for trainers and instructional designers who are new to e-learning design. The manual also provides basic concepts and information on the processes and resources involved in e-learning development, which may be of interest to human resource (HR), learning and development managers, IT managers and E-content developers.

The content of this manual is based on consolidated instructional design models and learning theories and incorporates more than 5 years of experience of UMAMI E-learning Solutions, including work practices, standards and quality criteria adopted for the delivery of learning programmes and self-paced e-learning courses in development contexts. While there are several definitions of e-learning, which reflect different perspectives, e-learning in this document is defined as follows:

> **E-learning is the use of electronic devices and Internet technologies to deliver a variety of solutions to enable learning and improve performance.**

This manual focuses on courses designed to meet job-related capacity-development goals and targeted professional profiles. Although many of the practices described can be applied to any capacity-development project, this document focuses on the design, development and delivery of activities that are specific to e-learning. Its focus is on e-learning solutions suitable for development contexts characterized by technology constraints, such as limited hardware capabilities and low-bandwidth Internet connections.

The manual is divided into four main sections:

01 Part

Introduction

Provides an introduction to e-learning characteristics, benefits, activities and the resources needed to develop an e-learning project. It mainly targets training and capacity-development managers and those who are interested in starting an e-learning project or integrating e-learning components into their organization's capacity-development programs.

02 Part

Designing an e-learning programme

Provides guidance on how to design an e-learning course (from the needs analysis to the definition of learning objectives, sequencing, choice of learning strategies and delivery formats). This mainly addresses trainers and instructional designers who aim to create learning projects that match learners' needs by choosing among different methods and delivery formats.

03 Part

Creating interactive content

Provides detailed guidance on creating interactive content (from the application of learning strategies and media to courseware development). This part targets content developers and subject matter experts involved in content development, as well as all those who want to know more about the methodologies and tools used to create e-learning content.

04 Part

Managing and facilitating the technical and the on job training

Provides a hands-on method of teaching the skills, knowledge, and competencies needed for employees to perform a specific job within the workplace. While every type of training has its own unique value, technical and on-the-job training are perhaps the important of all. Truth is, anyone can sit in a classroom, read books and complete tests successfully. However, applying acquired skills and knowledge in a practical setting is something else entirely.

Contents

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The content of this manual is based on consolidated instructional design methods and learning theories.

The examples used to illustrate e-learning processes and products are based primarily on the work of UMAMI E-learning Solutions Team, led by Dr. Hatem Askar and composed of: Salwa Salman, Ibrahim Assad, Reem Abdelhamid, Eslam Refaat, Aya Tarek, Hager Samy, Basanat Ihab, Heba Yaser, Amira Moubarak, Shreen Emad, Mohamed Magdy, Taher Farghal, Moustafa Abolnour, Menna Elsayed, Farida Hamada, Lama Kharat, Yasmin Noor Eldin, Magdi Saaid, Mohamed Elsebaai, Ahmed Ibrahim, Areegue El-Agrodi, Mona Yahia, Naira Anwar, Dina Fekry, Maged Hussien and Shmoaa Elkhadrway.

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Part I
Introduction

This section reviews the reasons for developing e-learning and provides an overview of those situations in which e-learning can be an appropriate solution. It also discusses the stages of developing an e-learning programme or course, the resources and technology required, the main types of learning solutions and e-learning components and some examples of UMAMI elearning Solutions courses developed to Support the e-Learning environment in the Holding Company for Water and Wastewater (HCWW) as part of the technical assistance provided by USAID under the Integrated Water Solutions Support Technical Assistance (IWSSTA).

Part I: Introduction

1.0 Getting started

This chapter will introduce you to the following topics:

- The main reasons for developing e-learning.
- E-learning components: e-learning content.

1.1 Why develop e-learning?

Many organizations and institutions are increasingly using technology to deliver learning. One advantage for them in using e-learning is its potential for providing a good return on investment. Developing e-learning programmes is actually more expensive than preparing classroom materials or organizing training the trainers' events, especially if multimedia or highly interactive methods are required.
However, delivery costs for e-learning (including costs of web servers and technical support) are considerably lower than those for classroom facilities, printing materials, instructor time, participants' travel and job time lost to attend classroom sessions.
Furthermore, while traditional methods can reach a limited number of individuals per year, e-learning can reach thousands of people, thereby resulting in a highly cost-effective method in the longer term.

E-learning can reach a wide target audience, including learners who are:
- Geographically dispersed, with limited time and/or resources to travel.
- Busy with work or family commitments, which do not allow them to attend courses on specific dates with a fixed schedule.
- contingent workers, such as consultants, professionals working part-time, independent contractors.
- Located in conflict and post-conflict areas and/or restricted in their mobility.
- Limited from participating in classroom sessions.
- Facing difficulties with real-time communication.

Moreover, web-based learning makes use of existing infrastructure (computers, servers, intranets, etc.) and learners' activities can be managed, tracked and monitored through learning management systems.
E-learning allows flexibility to learn anytime, anywhere. It enables learning to be easily (and cheaply) spread over time, so that it takes place over a longer period, thereby enhancing its effectiveness. Online learners can take e-learning courses from their office, home or any other place where there is an Internet connection.
They can benefit from just-in-time learning, by accessing e-learning content at the moment they need it, rather than over fixed dates and periods.
E-learning also allows the use of a variety of instructional methods, the combination of collaboration activities with individual learning, and the personalization of learning paths based on learners' needs.

E-learning can be a good option when...

- There is a significant amount of content to be delivered to a large number of learners.
- Learners come from geographically dispersed locations.
- Learners have limited mobility.
- Learners have limited daily time to devote to learning.
- Learners do not have effective listening and reading skills.
- Learners have at least basic computer and Internet skills.
- There is a need for developing homogeneous background knowledge on the topic.
- Learners are highly motivated to learn and appreciate proceeding at their own pace.
- Content must be reused for different learners' groups in the future.
- There is a need to collect and track data.

1.2 E-learning content

E-learning content can be produced for self-paced e-learning, where learners are free to learn at their own pace and to define personal learning paths based on their individual needs. Alternatively, it can be complemented by facilitation, social interaction and online collaboration activities.

E-learning content is usually hosted on a web server, with learners accessing it from an online learning platform. When offered through an Internet connection, there is the potential to track learners' actions in a central database through online registration.

E-learning content is developed according to a set of learning objectives and is delivered using different media elements, such as text, graphics, audio and video. Some types of e-learning product are mobile-responsive, meaning that they can also be accessed from and properly displayed on mobile devices (tablets and smartphones).

1.3 Types of e-learning content

E-learning content includes a range of materials that can be more or less sophisticated in the use of media and level of interactivity. Types of e-learning content can be classified as follows:

Simple learning resources

Simple learning resources are non-interactive resources such as documents, PowerPoint presentations, animated videos, video tutorials and audio files (podcasts). These materials are non-interactive, in the sense that learners can only read or watch content, but cannot perform any other action.
When they match defined learning objectives and are designed in a structured way, these materials can be a valuable learning resource, even though they do not provide any interactivity.

E-learning courses

E-learning courses are stand-alone interactive learning materials that correspond to one or more learning objectives by providing explanations, examples, interactivity, questions and feedback, glossaries, etc., in order to make learners self-sufficient in learning new concepts and skills. They can combine several types of media, including text, images, animations, audio and video.

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E-learning courses can include one or more e-learning lessons, whose duration should be limited to a maximum of about 30 minutes of learning time.

An e-learning lesson can have a linear sequence, where content is presented in a predefined order; or it can take a branching approach, where learners follow different paths according to their choices.
A range of instructional techniques can be used to create an e-learning lesson.

Regardless of the approach selected, there are some typical elements that are generally present in an e-learning lesson. They include:

1

Introduction
providing the learning objectives for the lesson and an overview of how the knowledge gained from the lesson can be used by the learner (motivational step)

2

Core content
a set of screens combining text and media elements, examples and practice questions

3

Summary
a short description of the topic covered, or lessons learned, to help the learner memorize the lesson's key points.

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E-learning courses often include additional resources, such as downloadable job aids (e.g. checklists, tables), a glossary providing key terms and related explanations, and a bibliography and/or links to web resources, where learners can find out more about the topic.

Simulations and games

Simulations and games are highly interactive forms of e-learning. The term 'simulation' basically means creating a learning environment that simulates the real world, allowing the learner to learn by doing. Simulations are a specific form of web-based training that immerses the learner in a real-world situation and responds in a dynamic way to his/her behaviour. Learning games involve a competitive component, a challenging goal and a set of rules and constraints.

Performance support tools

Performance support is informal learning that supports learners in applying existing skills or knowledge. Its use is integrated into the learner's work. It usually provides immediate answers to specific questions, thereby helping users to accomplish job tasks.

Performance support tools can take several forms and be delivered on different platforms (e.g. computer, printed document, mobile phone). Technical glossaries and checklists are a few examples of simple job aids, but sophisticated expert systems can also be developed to assist workers in complex decision-making.

Test

Tests (also called quizzes, assessments, or knowledge checks) are an essential component of e-learning. They can be integrated into an e-learning course or be provided as stand-alone learning components.

Tests help to assess learners' progress, as well as the effectiveness of learning. They also have the potential to increase learners' engagement and to support the learning process through the provision of personalized feedback.

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Test

2.0 What is needed to develop e-learning?

This chapter will introduce you to the following topics:

- The activities required to design and develop e-learning.
- Professional roles in an e-learning project, and
- The technology needed to produce and deliver e-learning.

2.1 The activities

Good design and planning, while crucial for every type of training programme, are even more important for e-learning projects.

E-learning content and activities must be carefully designed before implementation, as less space is given for last-minute adjustments compared with face-to face training. Producing e-learning content may require more resources, so it is important to make sure that the final product meets some quality criteria. In addition, e-learning content can be delivered many times to different learners, and reused in different contexts.

Also, social interaction through online tools must be carefully planned to keep engagement and participation by learners who are not physically present in the same room. Instructions for activities must be very clear and technology must work properly

Several models have been developed to guide project managers and instructional designers through the process of realizing an e-learning project. In this manual we refer to the ADDIE model, which is the best known one and includes five stages: Analysis, Design, Development, Implementation and Evaluation.

In general, using a model is wiser than proceeding without any plan, but flexibility is needed to select and adapt a model to a given situation. The ADDIE model is not intended to be applied as a rigid procedure, but as a flexible process that instructional designers can adapt to a specific project, using their creativity and competences.

Other models have been developed starting from ADDIE phases. For example, the Agile Project Management (APM) approach emphasizes iteration and openness to change throughout the project, by requesting training to be tested, evaluated and revised during design and development.

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Phases of an e-learning project

E-learning projects vary considerably in size and complexity. The process described below is comprehensive - it covers all the options that can be included in a complex learning project and can be applied to both self-paced and facilitated e-learning courses. However, some of the steps can be skipped or simplified according to the project's objectives and requirements, including budgetary, expertise and organizational constraints.

Part I: Introduction

1. Analysis

A needs analysis should be conducted at the start of any development effort to determine whether:

Training is required to fill a gap in professional knowledge and skills

E-learning is the best solution to deliver the training

The needs analysis enables the identification of general, high-level course goals.

Target audience analysis is another crucial step. The design and delivery of e-learning will be influenced by key characteristics of the learners (e.g. their previous knowledge and skills, geographical provenance, learning context and access to technology).

Analysis is also needed to determine the course content:

- Task analysis identifies the job tasks that learners should complete and the knowledge and skills that need to be developed or reinforced. This type of analysis is mainly used in courses designed to build specific job- related skills.

- Topic analysis is conducted to identify and classify the course content. This is typical of courses that are primarily designed to provide information.

2. Design

The design stage encompasses the following activities:

- Formulating a set of learning objectives required to achieve the general, high-level course objective;
- E-learning is the best solution to deliver the training.
- Selecting instructional, media, evaluation and delivery strategies.

The outcome of the design stage is a blueprint that will be used as a reference to develop the course. The blueprint illustrates the curriculum structure (e.g. its organization in courses, units, lessons, activities); the learning objectives associated with each unit; and the delivery methods and formats (e.g. interactive self-paced materials, synchronous and/or asynchronous collaborative activities) to deliver each unit.

3. Develeopment

In this stage, the e-learning content is actually produced. The content can vary considerably, depending on the resources available. For example, e-learning content may consist of only simpler materials (i.e. those with little or no interactivity or multimedia component, such as structured PDF documents), which can be combined with other materials (e.g. audio or video files), assignments and tests. In that situation, storyboard development and the development of media and electronic interactions would not be conducted.

The development of interactive e-learning content comprises three main steps:

Content: writing or collecting all the required knowledge and information.
Storyboard: organizing the content into a structure by choosing appropriate instructional methods and creating a storyboard, i.e. an intermediate product where all the components of the final object are defined, including images, text, interactions, assessment tests.
Courseware: finalizing the product by developing media and interactive components and generating the final version in the required delivery format(s).

4. Implementation

At this stage, the course is delivered to learners. The courseware is installed on a server and made accessible for learners. In facilitated and instructor- led courses, this stage corresponds to the actual delivery of the course to a group of participants, and it also includes managing and facilitating learners' activities.

Analysis
Design
Developement
Implementation

5. Evalution

An e-learning project can be evaluated for specific purposes. You may want to evaluate learners' reactions, the achievement of learning objectives, the transfer of job-related knowledge and skills, and/or the impact of the project on the organization.

2.2 The team

"Design and development of good e-learning is a complex undertaking. It requires content knowledge and expertise in a wide range of areas, including text composition, illustration, testing, instruction, interactivity design, user interface design, authoring or programming, and graphic design. It's rare to find a single person with all these skills, and even when such a person is available, training needs can rarely wait long enough for a single individual to do all the necessary tasks sequentially."

(Allen, 2016 p.55).

Part I: Introduction

Creating a team for designing and developing e-learning is a common solution, although some of the roles described in this section could be covered by a single team member. The composition of the team depends on factors such as:

- The size of the project
- The amount of work outsourced
- The capacity of team members to cover different rolesformat(s).
- The specific media and technologies required.

The roles described below are required to perform the ADDIE model's activities:

- **Project manager**
  This managerial-level person conducts needs and audience analyses before starting the e-learning project, coordinates all activities and roles in the different stages of the process, and evaluates the degree of transfer on the ob and the results for the organization/institution.

- **Instructional designers**
  Instructional designers (IDs) are responsible for the overall instructional strategy.

  They work with managers to understand the training goal, collaborate with subject matter experts (SMEs) to define which skills and knowledge need to be covered in the course, choose the appropriate instructional strategy and support the team in defining delivery and evaluation strategies.

  IDs are also responsible for designing specific e-learning activities and materials that will be part of the course, including storyboard development. At this stage, content provided by SMEs is pedagogically revised and integrated with instructional techniques and media elements, which will facilitate and support the learning process. In large self-paced e-learning projects, a lead ID may delegate the design of specific lessons to other designers.

- **Subject matter experts**

  Subject matter experts are the knowledge keepers. They contribute the knowledge and information required for a particular course. They collaborate with IDs to design a course and define evaluation strategies.

  In self-paced e-learning, SMEs can be tasked with preparing the text of specific e-learning lessons, while in facilitated or instructor-led e-learning, SMEs can act as online instructors, leading or supporting online classroom activities. They can prepare and present material, assign tasks to participants and answer their questions.

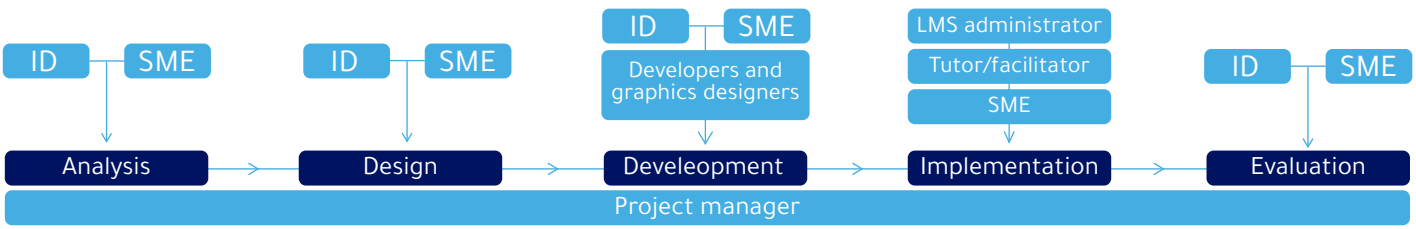
- **Learning management system administrators, online facilitators and tutors**

  These are roles involved in the delivery of facilitated or instructor-led e-learning courses. Learning management system (LMS) administrators create the course space in the learning management system, manage learners' subscriptions and provide technical support.

In addition to project managers and team members, other stakeholders need to be involved at different stages of the project. In particular, project sponsors (those who set the goal for the project and allocate resources) should be involved at the start of the project, when resources, tasks, activities and timelines are defined; they are often in charge of providing the final approval for project release.

Representatives of the target audience are also important stakeholders and their involvement in the first stages of the process is crucial to ensure that the course matches the needs of prospective learners.

Areas of responsibility for key roles ion the ADDIE process



2.3 The technology

Technology is required to produce and deliver e-learning. Digital tools and technologies are used in a variety of ways to support learning, teaching and assessment. A mix of digital learning tools, devices, platforms and applications is making learning more flexible and convenient.

Mobile technologies have proved to be useful for learners travelling in remote locations. Outreach benefits of such technologies are evident for learners living in remote areas and facing limited access to conventional learning.

With the use of authoring tools, organizations can put together different resources into interactive packages formatted in a standardized way to be easily updated, repurposed, delivered and accessed by unlimited numbers of learners.

Some projects may require a learning management system to track and administer learners' activities and manage e-learning content. Learning management systems are efficient administration tools, not only for profiling, monitoring and tracking learners and their progress and behaviour, but also as a central resource repository system for easier updates and cataloguing of instructional materials.

Full featured video conference tools are just one example of how learning experiences are being improved. Skype, Zoom, MS Teams, GoToMeetings, WebEx, Google Hangout, and similar services allow one-to-one, one-to-many and many-to-many working groups to share experiences with one another and interact inexpensively in real time, via PC or mobile devices.
Geographically dispersed trainers and learners can fully explore new virtual experiences such as: high-definition video, screen sharing, file sharing, instant messaging and lesson recording. The mixture of audio and visual impact faithfully replicates and emulates natural immersive face- to-face learning.

3.0 In summery

Key points for this part

1. Many organizations and institutions are using e-learning, since it can be as effective as face-to-face training, and reduces costs.

2. E-learning content can support self-paced learning, where learners are free to learn at their own pace and to define personal learning pathways based on their individual needs and interests.

3. In certain learning contexts and settings, e-learning resources can be made available for learning on mobile devices, such as smartphones and tablets.

4. A series of activities are required to develop e-learning. They can be grouped into five main categories: analysis, design, development, implementation, evaluation.

5. The following roles are generally required at different stages of the process (but some of them can be combined into a single job profile): project manager; instructional designer; subject matter expert; e-learning course developer and graphic designer, learning management system administrator, online facilitator and tutor.

6. Technology is needed both to create e-learning material and make it accessible to learners. Some projects may require the use of a learning management or other type of learning platform to track and administer learners' activities and manage e-learning content.

Part II

Designing an E-Learning Program

The initial stages of the e-learning project are essential to ensure course effectiveness. Understanding learners' needs, identifying appropriate content, and finding the right mix of learning activities and technical solutions is crucial to creating an effective and engaging course.

4.0 Analysing learning needs

This chapter provides guidance on how to identify learning needs. It will introduce the following topics:

- Reviewing the overall goal.
- Understanding the target audience, and
  Carrying out a task analysis.

4.1 What is the goal of the program?

Without a clearly defined goal, it is very unlikely that an e-learning project will achieve its results and justify the required investment.

A needs analysis is crucial to validate the need for an e-learning programme, and to provide important information regarding which gaps need to be addressed and what the overall goal of the programme should be.

Although it often happens that the overall goal is assumed to be well known, it is advisable to formulate this clearly, together with the project sponsor and other relevant project stakeholders, at the beginning of the project.

This initial analysis should answer the following questions:

- What is the organizational problem to be addressed?
- Is training required to fill the gap?
- Is e-learning the best solution to deliver the training?

A learning initiative can only help to solve the problem in the latter case, when lack of individual capacity is the issue to be addressed. Moreover, not all individual capacity problems are learning problems, i.e. they are not always due to a lack of knowledge or skills. A common assumption is that if an individual is not performing well, then training or other learning activities are the solution. Frequently, however, performance problems result from a lack of support in the work environment, such as bad data, worn-out tools or poor incentives.

Also, not all learning problems can be addressed through e-learning. it is crucial to understand whether e-learning is appropriate for the learning goals identified.

If an e-learning initiative is considered to be a suitable solution to address the identified performance gap, then the programme goal should be defined around desired performance outcomes.

4.2 Who is the target audience?

Once we know what we want to achieve through the learning programme, the next step is to focus on the intended learners.
A target audience analysis is needed to identify a variety of factors that will influence the course design. Some of them are presented below.

Factor to be considered	Why is it important?
Region or geographical area in which learners reside.	This is needed to define language and cultural issues and to inform choices between synchronous and asynchronous tools (learners located in different time zones will have difficulty communicating in real time).
Kind of organization or institution in which learners work and their professional role(s) within them.	This will help to identify specific learning objectives for each target audience group
Learners' previous knowledge and expertise on the subject.	In general, learners with substantial prior knowledge do not need the same kind or level of training support as novices. This regards the technical level and depth of the content, as well as the way that the content is presented.

Part II: Designing an E-Learning Program

Factor to be considered	Why is it important?
Learners' computer skills and technical expertise.	This will help to define the complexity of the computer- based interactive activities.
The amount of time available for e-learning and the learning context.	This information influences the amount of content to be provided and the need for grouping the content into small chunks. Knowing the learning context can help to understand whether an e-learning course, microlearning content or performance support tools may be appropriate.
The location where learners will participate in e-learning and from where they can access it. Do they study at home, at work or in e-learning centres? Are they in front of a computer, or do they work primarily on a tablet or a smartphone?	This influences the choice of course format. For example, there could be a need to provide materials offline in a downloadable format, or in a mobile-responsive format that can be properly visualized on tablets and mobile phones.
Network bandwidth.	Bandwidth limitations may slow application performance and reduce user productivity. In certain situations, low bandwidth applications may be preferred, since they take less time to transmit.

4.2 Who is the target audience?

A programme goal, such as ‘ ’, provides an initial definition of the content and a focus for the course design. Now, how to move from this general goal to a definition of course content and activities?

The fundamental question to ask is: what knowledge and skills should learners acquire to be able to achieve the overall programme goal? In our example, the question is: what knowledge and skills should employees develop, in order to improve the quality of their skills?

For programmes designed to build specific job-related skills, conducting a task analysis can be an effective way to identify the knowledge and skills to be addressed, starting from the desired performance outcome expressed by the course goal, combined with available information on learners’ previous knowledge.

5.0 Organizing your content

This chapter provides guidance on how to define the course content and organize it into a structure. It will introduce the following topics:

- Defining learning objectives
- Defining the course sequence

5.1 Defining learning objectives

Learning objectives determine the expected outcome of each learning unit. For example, will learners be able to memorize the steps of a procedure, or will they be able to perform it?

What is a learning objective?

A learning objective is a statement describing a competency or performance capability to be acquired by the learner. Objectives should be specified for the course, as well as for each single activity.

Learning objectives combine two main elements:

1. The expected level of performance
(through an action verb, such as 'describe' or 'explain')

2. The learning content
(i.e. the type of knowledge or skills that must be earned).

to learners. This reflection will also be useful in subsequent stages, when you define the best instructional techniques to use in presenting your content, and the assessment and evaluation tests.

5.2 Defining the course sequence

How should the learning objectives be sequenced when structuring a course?

One of the methods used to define the course sequence is the prerequisite method. This method uses a learning objectives hierarchy, first teaching those skills that seem to be prerequisites for all other skills.

There are several methods that can be used to organize and sequence the content, and different methods can be integrated to design the best structure for your course. Some of these other methods include the following:

E-learning can be a good option when:

- In a job-oriented course, the content can be organized to follow the order of the actions in the real job environment.

- In a non-job-oriented course, concepts can be organized according to their structural connections, such as by:
    - Describing the characteristics of a class before sescribing its members.
    - Providing examples first, then definitions, or
      Starting with concrete or simple information, and then proceeding to abstract or complex concepts.

- If learners' profiles (e.g. general characteristics, job profiles, educational background) are well-known, concepts that are most familiar to learners can be presented before those that are far removed from learners' experience.

- The curriculum can start with a more general overview, then focus on specific topics, and at the end go back to the general conclusion.
- The curriculum can revisit the basic ideas, repeatedly building on them until the learner understands them fully.

The outcome of sequencing is a course structure where each element corresponds to one or more learning objectives and contributes to achieving the overall course goal.:

6.0 Defining delivery, instructional and evaluation methods

This chapter provides guidance on how to make decisions about the overall course design. It will introduce the following topics:

- Delivery formats.
- Instructional methods, and
- Evaluation methods.

6.1 How to deliver the learning?

The choice of delivery format for a specific course is linked to the type of instructional method selected, as well as to factors related to learners' characteristics, technological and organizational constraints (e.g. budget), and the time available

Learner-related factors

The following are important factors to consider about learners:

- Learners' comfort with delivery channels

  Audio and video conferencing (i.e. synchronous e-learning) make it easier to develop a social presence and can enable more spontaneous exchanges to be generated. However, time limitations mean that not everyone can be available to participate

  All the time, especially in large classes and if there are dominant personalities. Also, audio and video conferencing can be frustrating for non-native language learners. Conversely, everyone can participate in asynchronous discussions and forums.

- Learners' level of technical expertise

  If they have only recently experimented with e-mail, learners may have difficulty working with whiteboards and video conferencing. It is important to consider how much technical support can be offered to them.

- Learners' available time

  In general, asynchronous learning allows more flexibility regarding time management. Learners can take lessons and contribute to discussions at the time that is most convenient for them, and review materials as often as needed. If learners are busy, are in different time zones, or cannot conform to rigid schedules because they can only access a shared computer during certain hours, asynchronous tools may be preferable. Also, carefully designed self-paced material may be shorter and more concise than a presentation given in a live session.

Technology aspects

The capacities of learners' computers, as well as their infrastructure and connectivity, need to be considered before making any decisions on technology.

Understanding whether learners have easy access to network systems is crucial when deciding on the delivery format. Being aware of bandwidth limitations is particularly important. In the event of limited Internet access, for example, it may be necessary to provide materials offline in a downloadable format, or to deliver training through mobile technology. In this latter case, a mobile- responsive format - which can be properly visualized on tablets and mobile phones - may need to be adopted.

It may also be important to consider what kind of computers and software programmes learners use, especially when creating e-learning courses in development contexts. Technical requirements, including multimedia capabilities, influence the selection of the media mix. However, it should be noted that using several different media tools does not necessarily improve the effectiveness of an e-learning activity. Good instructional design is more critical to achieving learning effectiveness than using sophisticated multimedia effects.

If delivery on mobile phones is considered, you may want to collect information about the type of smartphone used by participants, and the data plan that they have agreed with the telephone company.

Part II: Designing an E-Learning Program

Organizational requirements and constraints

A range of organizational requirements and constraints, such as the time and budget available, will influence the choice of delivery formats.

Developing self-paced learning will generally require more time than preparing a virtual classroom. When instruction needs to be provided in the least amount of time, a series of large virtual classes may be the best solution. Investing in the development of a self-paced course makes sense to meet long-term training goals, rather than immediate, urgent training needs.

However, it is important to bear in mind that development costs for interactive content have dramatically declined due to the development of new authoring tools. Moreover, e-learning materials can be reused several times in different versions of the same online course, or as components of different online courses. Knowing the number of learners and how many learning events are planned in the future is therefore important in assessing the cost impact.

If planning a facilitated course, the organization must have appropriate resources to ensure facilitation and subject matter experts' support throughout the course. Using a learner management system can be a valid option for the organization, if there is a need to track learners' activities by following their participation and performance, for example their contributions to online discussions, use of learning materials and online evaluation test results.

Good practices

By making use of asynchronous and synchronous learning and collaborative tools, it is possible to define e-learning solutions that match specific needs. Some good practices include:

- Combining structured and ad hoc solutions

  For example, an extensive curriculum on information security can be developed as a stand-alone course, while short virtual workshops can be used to illustrate updates to a methodology or guidelines, to address a recently emerged problem.

- Localization

  If you have a diverse and geographically dispersed learner group for which cultural adjustments are required, you might decide to develop a large self-paced e-learning course for all learners, followed by virtual classes to deal with local issues, challenges related to the environment and context, and cultural differences.

- Allowing downloads

  Even in contexts with highly developed infrastructures, learners do not have continuous access to the Internet. They should be able to download online content and work on it offline.

6.2 Defining instructional methods

As with traditional face-to-face training, any e-learning programme will probably use a combination of different instructional methods. These can be grouped into three main categories:

1. **Expositive methods:** which emphasize the 'absorption' of new information. Expositive methods include presentations, case studies, worked examples and demonstrations.

2. **Application methods:** which emphasize the active processes that learners use to perform procedural and principle-based tasks and build new knowledge. Application methods include the demonstration-practice method, job aids, case-based or scenario- based exercises, role play, simulations and serious games, guided research and project work.

3. **Collaborative methods:** which emphasize the social dimension of learning and engage learners in sharing knowledge and performing tasks in a collaborative way. They include online guided discussions, collaborative work and peer tutoring.

Each method can be delivered in different formats, using different types of media and communication tools. For example, a presentation can be delivered as a PowerPoint file or as a recorded (or live) video presentation. An online discussion can be conducted in a discussion forum or through a Zoom call.

6.3 Defining the evaluation strategy

Another important decision relates to the evaluation strategy for your course. It is very important to think about this from the design stage.

What is the purpose of evaluation?

Evaluation can be conducted to accomplish specific evaluation purposes. You may want to evaluate the course during the development stage to improve it before it is finalized, or do an evaluation at the end of the course to measure its effectiveness, or examine a past course, to see if it is still valid and can be reused in a new context.

In other words, you may want to evaluate a course:

- During the development stage, to improve instructional courses or products (formative evaluation).
- During or immediately after the implementation stage, to measure the effectiveness of education, training and learning (summative evaluation), and/or
- Some time after the course has been implemented, to understand if it is still valid or needs to be updated or modified (confirmative evaluation).

What can be evaluated?

According to the Kirkpatrick model (Kirkpatrick, 2006), evaluation can encompass four levels:

- Learner's reactions
- Learning
- Behaviour
- Results

Evaluating learners' reactions means understanding how those who participate in the programme react to it, if they participate actively and if they like the course. This can be measured through questionnaires and surveys, which are usually submitted to learners at the end of the course. In facilitated e-learning, learners' participation is monitored by the facilitator throughout the course period.

Part II: Designing an E-Learning Program

Evaluation (or assessment) of learning measures the achievement of intended learning objectives. Depending on the type of course, this can imply that participants have increased knowledge, developed skills, and/or changed attitudes as a result of attending the course.

Learning can be assessed through direct observation, assignments and tests.
It is crucial that assessment is aligned with learning objectives, i.e. that it measures the expected outcomes set at the design stage.

7.0 In summery

Key points for this part

1. A learning objective is a statement describing a competency or performance capability to be acquired by the learner.
2. Defining learning objectives clarifies expectations about outcomes from learners.
3. Objectives should be specified for the course, as well as for each single activity.
4. Learning objectives and relevant topics are organized in a logical structure, using various sequencing methods.
5. When deciding between using offline and online, synchronous or asynchronous approaches, it is important to consider learner-related factors (e.g. learners' technical expertise and available time) and technical aspects (e.g. hardware and software requirements and speed of Internet connection).
6. Learning objectives can be achieved through a wide range of learning methods, such as self-paced interactive lessons, case-based or operational simulations, online discussions, collaborative activities, virtual classrooms, assessment tests and surveys. Special attention should be paid to technological and resource constraints.
7. The overall evaluation strategy and the methods for assessing learners' progress should also be defined as part of the design stage.
8. Evaluation allows you to assess learners' progress, the quality and effectiveness of the course, and improve future learning activities and content.

Part III
Creating
E-learning content

E-learning content must be accurately prepared and presented in order to be effective.Instructional techniques should be used creatively to develop an engaging and motivating learning experience.

This section will illustrate the process of developing e-learning content, including preparing the content, applying instructional techniques and media, and creating the final interactive product using appropriate software and authoring

8.0 The process of content development

This chapter will introduce you to the following topics:

- Preparing content for e-learning, and.
- Storyboard development.

8.1 How subject matter experts contribute to e-learning development

Collecting appropriate content to build e-learning materials may require interaction with a subject matter expert. The extent of a subject matter expert's contribution can vary, depending on the amount and quality of existing material.

In fact, it is very likely that a set of materials for a specific subject is already available. These may consist of:

- user manuals and technical documentation;
- classroom course handouts and lecture notes;
- presentations, such as PowerPoint slide shows;
- documented case studies;
- photographs, images, graphs, tables and other illustrative materials;
- training materials, such as self-study guides, web guides and other distance learning materials; and
- reference materials, such as specialized thesauri and glossaries.

When developing e-learning materials, there are generally two main scenarios. If appropriate content already exists, the instructional designer will integrate content taken from different sources and may request some inputs from subject matter experts (such as additional examples, glossary terms and relevant descriptions, recommended reading and resource pointers). Otherwise, one or more subject matter experts may be requested to write the content from scratch.

In either case, the subject matter experts must review the storyboard to verify that the content has been correctly interpreted by the instructional designer.

8.2 Tips for content development

When subject matter experts are in charge of developing content for e-learning lessons, they should refer to the course outline (or course plan), so as to be informed about the topics to cover and the approach to take in illustrating these (e.g. the level of detail, the language to use, the preference for illustrating concepts through examples or case studies).

The following are some tips for subject matter experts on authoring lesson content.

- Before developing the content for the assigned lessons, review the proposed learning objectives.
- Make sure that the content and knowledge assessment tests and exercises 'match' the lesson objectives at every step in the workflow process.
- Provide all the knowledge needed to meet the learning objectives, including information that may seem obvious to you, but may be new to learners.
- Use examples that are likely to be familiar to most, if not all, learners. People taking the course may have different backgrounds, so use a variety of examples. This will help learners to understand and remember concepts.
- Classify topics for each lesson as follows:

- **Must know**: core part of the content; the learner needs to understand these concepts.
- **Nicetoknow**: the learner could get by without this information, but it could help to develop a better understanding of the subject or add interest for the learner.

8.3 Creating the storyboard

What is a storyboard?

The term 'storyboard' is taken from movie production, where it indicates a visual representation of the various scenes of a film. In e-learning, the storyboard describes screen-by-screen what will happen in the final lesson. The storyboard is not a final product. It is an intermediate product that is then used by content developers to create the final interactive e-lesson.

In most cases, the instructional designer creates a 'storyboard' (also called the script). This is the design document that details the content and behaviour of each element for each screen of a given lesson. These elements include text, images and other media, animations, tests and other interactive features.

Storyboards can be created using a variety of tools, including word processing programmes, PowerPoint and specific e-learning authoring tools.

The following is an example of a storyboard for an e-learning lesson, created with PowerPoint. The storyboard can be reviewed by subject matter experts and other stakeholders, including representatives of the target audience when feasible.

Once comments from the expert and other reviewers have been integrated, the instructional designer can pass the lesson to the graphic designers and course developers, who finalize the lesson by developing media and interactivity features.

Part III: Creating e-learning content

9. Using instructional techniques for content development

This chapter provides guidance on applying different instructional techniques to create engaging and effective e-learning content. The chapter starts with an overview of fundamentals elements of instructional design, which are at the core of any e-learning course, such as:

- Presenting different types of content.
- Using examples to improve learning.
- Developing practice and assessment tests, and
- Using media (text, graphics, animations, audio and video).

Part III: Creating e-learning content

Then, some more specific instructional techniques for presenting e-learning content are introduced, namely:

- Pedagogical agents
- Toolkit approach
- Demonstration-practice method
- Storytelling
- Case-based scenarios and serious learning games
- Gamification
- Microlearning.

9.1 Presenting different types of content

Analysing the different types of knowledge elements that constitute the content can help the instructional designer to present the content properly, in order to facilitate understanding by learners. The table below offers some tips for presenting different types of content:

Types of learning content		Tips for presenting content
Facts	Unique, specific information that answers the questions: who, where, when? Facts are shown, exhibited or indicated.	Provide a clear statement of the fact. Use visuals and infographics if feasible.
Procedures	A procedure is a series of clearly defined steps, aimed at performing a task. Procedures answer the question: 'How to ...?'	Make clear the various steps of the procedure, e.g. by using diagrams, tables or illustrations. For complex procedures, provide a map that clarifies which step are you currently describing, and/or a summary of the steps at the end. For software procedures, consider using the demonstration-practice method.

Part III: Creating e-learning content

Concepts	A concept is a group of objects, entities or ideas that: are defined by a single word or term; share common characteristics; differ in unimportant characteristics; require a definition; and answer the question: 'What is ...?'	Provide a definition of the concept. Especially for complex or abstract concepts, it is crucial to provide one or more examples, and non-examples. Use visuals to support understanding of complex or abstract concepts, showing relationships between elements.
Principles	A principle (or rule) describes a relationship between two concepts. For example: 'As price increases, the supply increases'. Some principles can be translated into strategic guidelines, which can guide decisions and complex tasks.	Clearly state the principle or rule. Provide one or more examples, and non-examples. Use visuals to support understanding of cause-effect relationships. Consider using a scenario-based approach and serious learning games for teaching strategic guidelines.
Interpersonal skills	Verbal and non-verbal skills for inter-acting with other people.	Make learners practise rather than just providing principles and guidelines, for example, by using experiential simulations. Virtual reality has strong potential for developing interpersonal skills. Consider using storytelling, scenario-based learning and serious learning games.

Attitudes	Predispositions to behaviour.	Use examples, scenarios and stories showing the importance of applying a given behaviour, and the negative consequences of not applying it. Pictures and videos have strong potential to influence attitudes.

Adequate practice tests should be linked to each type of content, to increase the effectiveness of learning.

9.2 Using exmaples to improve learning

Adding examples is crucial to facilitate an understanding of concepts and the application of strategic principles.

Examples should always be present in your e-learning content, as they can help learners to make sense of concepts. They are particularly relevant when you need to explain abstract concepts, or to show the concrete application of a given process or procedure.

Examples can be used in deductive and inductive ways:

- To illustrate a concept or show the steps of a procedure that has been previously introduced (deductive)
- To stimulate thinking and reflection before providing definitions and principles (inductive).

9.3 Developing practice and assessment tests

Practice and assessment questions should be designed to reinforce the achievement of learning objectives.

It is important that questions for practice and tests are aligned with learning objectives and learning activities, in order to correctly assess the right level of expected performance and content.

Questions play an important role in involving learners and keeping their attention, so you should try to use them as part of your core content, as well as for pre- or final testing.

In a job-oriented course, the questions should be placed in a job-realistic context, to build knowledge and skills that can be transferred to the job.

Question formats

In self-paced e-learning, practice and tests mainly consist of questions associated with response options and feedback. They generally have the following structure:

- A question or statement.
- An operational message that indicates to the learner how to perform the required operation (e.g. click, drag, press a key).
- A series of options.
- The correct answer
- Feedback for the correct and incorrect answers.

The most frequently used question formats include:

- True or False
- Multiple choice
- Multiple responses
- Matching
- Ordering
- Fill in the blank
- Short answer / Essay

9.4 Using media elements

A number of different media can be combined to create compelling e-lessons. Pay careful attention when integrating media elements into your storyboard, to avoid overloading learners' working memory, as this can be detrimental to the learning process.

Media elements: Text

Written text is an important 'medium' for communicating learning content. Some learning resources are completely text-based. The power of text-based resources is that learners can browse the text and find just what they need. Careful attention should be given to the text's graphic display and integration with images.

Tips for using text

- Display on-screen text to provide the best readability and clarity.
- If possible, use diagrams, graphs and flow charts to help the learners understand the content.
- Use graphic conventions consistently; for example, italic style must always be used for the same purpose.
- Use lists or tables to help learners organize the information.
- Use list points or blank spaces to separate items in a list, or focus attention on them.
- Consider word and row spacing to improve text readability.

Media elements: Graphics

Graphics include illustrations, pictures, diagrams and icons. They can range from photographic, realistic images to schematic representations or even tables.

Graphics can serve different communication functions, including adding aesthetic appeal or humour, depicting an object in a realistic fashion, providing retrieval cues for factual information, and supporting understanding of relationships between different elements and changes of an object over time.

Part III: Creating e-learning content

Graphics can play a crucial role in promoting learning. They should not only be used to add aesthetic appeal or visual interest to a screen. In e-learning, relevant graphics can facilitate learning by:

- Drawing attention to a specific content element
- Suggesting analogies between new content and familiar knowledge
- Supporting the understanding of concepts
- Simulating the work environment and real situations
- Motivating learners by making materials more interesting.

Tips for using graphics

- Try to avoid graphics that have no real function in complementing the information in your text. Purely decorative graphics do not help learners to understand the text and should be minimized.
- Images, tables and graphs should be clear and easy to read. Provide text alternatives for non-text content to make content accessible for people with disabilities.
- Use images that are sensitive to gender and reflect diversity.
- Use pictures when creating a realistic context and suggesting analogies to real-life situations.
- An animated illustration can be used to show a series of procedural steps or the stages of a process.
- A matrix, conceptual map or tree diagram can show relationships among content.
- Line charts can demonstrate trends and enable learners to make comparisons between two or more variables.

Types of graphics

- Pictures
- Realistic illustrations
- Vectors
- Conceptual illustrations
- Diagrams

Media elements: Aniamtions

An animated illustration can show a series of procedural steps or transformations.

Tips for using animations

- Allow learners to focus on only one object at a time.
- Use arrows to steer attention to selected details or motion direction.
- Segment long or complex animations and allow learners to access each chunk at their own pace, rather than playing all the steps continuously (e.g. by adding Play and Pause buttons).
- Limit the use of animation effects on text because they do not have any instructional function and can irritate learners.

Media elements: Audio

Appropriate use of audio can greatly increase the effectiveness of a course. However, you need to carefully evaluate if your project really needs audio narration. In general, audio narration works best when used to explain or describe on-screen visuals, rather than to read on-screen text. You can use audio for the entire course, or only for specific parts of it, such as dialogues and scenarios.

Tips for using audio

- Keep the audio short.
- Use audio to complement the visual elements on the screen. For example, during a procedural demonstration, audio can be used to explain animated steps.
- It is critical that audio narration is synchronized with on-screen text, visuals or animation. This is especially important for complex animations and animated videos.
- Do not use audio to simply 'read' the text on the screen; instead, combine audio narration with on-screen text to summarize or expand on key points, or to accompany video sequences.
- You can also consider using audio interviews to increase credibility and authenticity to your course by adding the voices of experts, specialists, or colleagues performing similar tasks.

Media elements: Videos

Video is the only media tool that makes it possible to reproduce behaviour, processes and procedures the way that they appear in real life.
It can be used to present a case study, and is especially effective in role play to illustrate communication between people, especially if there is emotion involved.

Tips for using videos

- Consider using videos to show anything that happens over time, like processes or procedures, or to show dialogue between people.
- Avoid using video only to show a trainer speaking.
- Video sequences should always be accompanied by comments, in either written text or audio narration. Include closed captions or a full transcript to increase video's accessibility.
- In situations with limited bandwidth connections, a video sequence can be replaced by a sequence of pictures.

9.5 Using pedagogical agents

A simple technique to add a human sense to the content is the use of pedagogical agents - characters that guide learners through the course. If well designed, pedagogical agents can have a motivating effect and facilitate learning.

When should pedagogical agents be used?

Pedagogical agents can be used with any type of content, including information-oriented (rather than job-oriented) courses where other more job-oriented techniques such as storytelling and case-based scenarios cannot be applied.

Tips for using pedagogical agents

- Pedagogical agents can take the form of coaches or tutors to guide learners through the course. For adult learners, it can be more motivating to choose an informal role such as a peer (e.g., a more experienced colleague) instead of a more formal, authoritative role.
- Characters should be used sparingly, rather than being present in every screen.
- Characters should use a conversational style in addressing the learner. Emphasize first- or second- person forms of address (e.g. 'you' and 'your') rather than third-person forms. Include comments directed at learners, such as "Let's take a look at the result of our analysis".
- Although expressive gestures and emotions may increase learners' motivation, avoid displaying irrelevant gestures, facial expressions or motion: learners may be overloaded and consequently pay insufficient attention to the learning material due to the extraneous cognitive load caused by an engaging but distracting pedagogical agent.
- Be careful about gender and cultural issues when developing your characters.

9.6 Storytelling

What is storytelling?

Storytelling provides information through a story narrative that places content in a realistic context and illustrates the actions and decisions of one or more characters. It can use illustrations, pictures or video sequences.

When should storytelling be used?

The storytelling technique can be useful when you need to:

- Provide job-specific knowledge

- Describe complex processes, where different actors perform different actions. The story can clarify who does what and helps learners to follow the flow of events
- Add a human aspect to the lesson, since learners can follow the stories of real people
- Highlight the usefulness of the knowledge, since storytelling allows you to show how this knowledge can be integrated into a real situation.

Tips for using storytelling

- Create a realistic and credible context. This is important for motivating learners, as it enables them to identify with the characters in your story. Learners need to feel that the story is similar to their own experience, and that the challenges faced by the characters could also happen in real life. This will help them to appreciate the usefulness of the knowledge that you are presenting.
- Characters do not need to be present in every screen. 'Story screens', which show characters' actions and dialogue, can be alternated with 'theory screens' - i.e. screens providing concepts and guidelines. Story screens can be used to focus learners' attention on specific issues. For example, you can use them to:
    - Introduce a new topic: a story screen can present a topic (e.g.a specific task or a new problem that characters have to address), which is then followed by two or three theory screens to illustrate that topic; a story screen can then be used again to introduce the next topic
    - Illustrate critical actions or decisions - a story screen can describe important actions and decisions that often lead to common mistakes and doubts
    - Develop practice exercises - a story screen can be used to ask the learner questions about the story, applying guidelines to that specific situation.
- Be careful about gender and cultural issues when developing your characters. Know your target audience to better define the story characters' geographical provenience, names and style of dress. Dialogue among characters should be gender- and culture-sensitive.

- Try to make dialogue realistic by keeping sentences short and using informal language. Complex explanations should be provided in theory screens, rather than included in a dialogue.

9.7 Case-basedscenarios and serious learning games

What are scenario-based and learning game approaches?

Case-based scenarios are built around a plausible situation. Typically, the scenario is a situation that presents a realistic challenge. Unlikely storytelling, this approach implies that the learner is the main actor, who must respond to the challenge by making a series of choices and decisions. Feedback is provided to the learners for each option.

Using branched scenarios can be an effective way of using this approach, as the feedback to learners' choices is provided through a follow-up situation that produces more choices, thereby showing the effects of learners' decisions.

Serious learning games can be considered as a specific type of experiential simulation that involves a competitive component, a challenging goal and a set of rules and constraints.

When should scenario-based and serious game approaches be used?

This approach allows learners to learn strategic principles by applying them to a concrete situation and observing the consequences of their decisions.

The scenario-based approach can be useful when you need to:

- Develop problem-solving or interpersonal skills
- Teach strategic principles rather than conceptual and factual knowledge
- Develop an interactive exercise at the end of a conceptual unit, i.e. As a practice lesson following a set of lessons that provide underlying concepts and principles.

This type of approach requires strong collaboration between the instructional designer and the subject matter expert, as the former needs to have enough information to design a realistic situation, provide learners with the information for the decisions that they must take, and provide appropriate feedback on their choices.

Tips for using a scenario-based approach

- Involve a subject matter expert in the creation of a scenario, which must be work-realistic, relevant and credible.
- Make the scenario engaging and immersive. This can be made by using images, characters, short videos, and defining challenging situations that motivate the learner to take action, for example a mismanaged situation that needs to be repaired.
- The trigger event, i.e. the initiating event that sets the scene for scenario, should mimic the reality of the learner.
- To respond to the challenge, the learner will have to make a series of decisions. The subject matter expert can help you to understand which decisions a person would make in that situation, and can share different experiences and possible outcomes.
- Each critical decision will have possible choice options. Choices should not be obvious. Provide detailed feedback for each option by commenting on the choice, or showing its consequences.
- To make the various decisions, the learner will need some information on the situation. Make sure to provide the learner with all the information required.
- Avoid creating too complex scenarios that include unnecessary information.
- The information can be provided as part of the scenario description, or it can be made available on demand, so that learners can freely explore and interpret it.
- Additional support can be provided to help learners to make the right decisions, for example through checklists, guiding questions or tips.
- If developing a serious game, develop rules of play and formulate the content in terms of outcome rules and strategies.

9.8 Gamification

What is gamification?

Gamification is the inclusion of elements and techniques that are typical of games, such as:

- Points
- Levels
- Rewards
- Timers
- Badges
- Competition

Adding game elements can increase motivation to engage in learning events. This should not be confused with developing serious learning games, which are designed to develop strategic skills by allowing learners to make decisions and witness the consequences of these, as described in the previous chapter.

When should gamification be used?

There are no specific restrictions on the use of game features in e-learning. They are very easy to implement with authoring systems. However, it is important to use gamification exclusively to support learning objectives; otherwise they risk becoming distractions. In addition, it should be remembered that:

> **Gamification E-Learning deosn't substitue for an effective instructional approach**

10.0 Courseware development

10.1 What does courseware development

Courseware development can involve several activities. Specifically, these are:

- The creation of a graphical layout for the course, including graphical user interface and recurrent elements such as icons and standard pages (e.g. Lesson cover, introductory page, test pages, summary page)
- The development of media (audio, video, animations, illustrations) and interactivity for each screen
- Quality assurance testing.

The effort and time required at the courseware development stage depends on how complex your interactive content is, and the combination of tools and media that are necessary for its creation.

Nowadays, a variety of tools are available to support the creation of the course, as well as the development of specific media elements.

10.2 Authoring tools

The e-learning authoring tool market offers numerous options for educators to assemble a range of diverse features, such as text, illustrations, animations, audio, video and interactivity, to create their own courseware.

E-learning authoring tools significantly reduce the time and cost related to content production, such as the WYSIWYG editing space or multiple output preview. Eliminating the technical complexity of writing codes and scripting in a programming editor, these are suited to independent authors, e-learning professionals and educators.

Part III: Creating e-learning content

At the simplest level, presentation tools, such as PowerPoint (PPT) or even word processors, are regarded as e-learning tools. Nevertheless, their limited interactive features, linear navigation structure and lack of support for e-learning standards, make such tools unsuited for learning management systems to track user progress and completion.

In their early phases, many authoring tools were simple PowerPoint 'add-ons', able to convert a set of slides directly from PowerPoint. For example, iSpring Converter Pro20 or Presenter36021 are commonly used to rapidly convert PPT presentations to highly engaging, interactive e-learning courses.

Adobe Captivate22 (now part of the complete toolbox for developing professional e-learning content) was born as simulation and demonstration software, but with its object styles and rich interactive elements, it has now evolved into a multipurpose development tool.

Authoring tools fall into many categories, depending on their features, level of customization complexity and installation site (i.e. desktop or cloud), ranging from simple PowerPoint converters, built-in tools inside LMS (such as eFront23 or aTutor),24 to powerful stand-alone packages that give educators the freedom to create the entire e-learning course within just one integrated toolset.

Some core functionalities of authoring tools include:

- Navigation
- Linear or custom navigation, menu-driven content and ability to move throughout the content
- Simple and conditional branching
- Ability to move to another course section based on the result of if-then decisions or events
- Editing
- Content publisher for easier changes/updates
- Visual programming
- Use of buttons, icons, drag-drop graphics
- Media capabilities
- Insert, modify, store, trigger audio, video image assets

- Assessment features
- Use of a variety of question types, question randomization, assessment tracking
- Animations and interactions
- For a more engaging experience, enhancing the instructional value
- Templates, skin types
- Formatting, modifying, sharing templates to personalize the course
- Programming with a scripting language
- Support scripts to collect user input and responses, create triggers
- Review
- Ability to see or test an ongoing project
- Cross-platform interoperability able to run on all platforms
- Cross-browser interoperability able to run on different browsers
- Integration with leading e-learning applications and compliance models, such as Sharable Content Object Reference Model (SCORM) and Aviation Industry CBT [Computer-Based Training] Committee (AICC), for LMS delivery
- Multiple publishing options SCORM for LMS, Web, CD-ROM, mobile and MS Word
- Localization and multilinguals to easily localize course content.

Navigation options

Enabling the learner's control over the process is particularly relevant in adult learning. Navigation is the ability to consume the content in a certain order, usually intended by the course creator. Typically, one of the simplest authored navigations makes it possible to control pacing within a lesson and move from one instruction to another with the use of next/previous swipe/buttons.

Using responsive HTML5 tools, content is scrollable and displayed vertically on mobile devices. Alternatively, learners can use menu navigation, when selecting specific lessons and topics within the course.

Ultimately, instructors can also enable learners to use non-linear navigation, allowing them to select their own order of information and activities, as opposed to the one displayed on the screen, so as to have a more personalized learning experience.

The SCORM model

In order to be appropriately uploaded and made accessible from an LMS, e-learning lessons and courses must conform to a set of technical and instructional standards.

For example, SCORM (Sharable Content Object Reference Model) encompasses the following standards:

- Packaging standards that allow courses to run under different lmss
- Runtime specifications on how lmss can launch courses, and how they report results back to the system
- Metadata standards to create and publish metadata records about courses, lessons and topics.

10.3 Authoring tools for mobile learning

Mobile learning (m-learning) and microlearning are growing trends in the e-learning sector.

Modern authoring tools can create device- and platform-friendly learning content. Such as HTML5 format, e-learning projects that are primarily designed for desktop/laptop layout can easily be adapted to different mobile device screen size and orientation.

10.4 Selecting an authoring tool

There is no right or wrong authoring tool - the best choice is the one that meets your business needs and supports your instructional approach.
Before identifying a suitable solution, an organization must have a thorough understanding of its training goals and objectives, as well as the learners it aims to reach and the variety of content types it seeks to develop. Selecting e-learning authoring tools is a long-term investment, so it is important that the best fit is not only suitable for current authoring needs, but also for business challenges and opportunities in the future.

To accomplish this, an organization needs to take into consideration the learners' needs and goals, for instance, their geographical location - whether they live or travel in remote areas, their age, gender, cultural/educational level, bandwidth potential, preferred device, difficulties that they may face with some technologies, etc. A clear vision of who will consume the learning is fundamental to understanding the detailed core functions and abilities of a potential e-learning tool, so as to create the desired educational resources. For instance, it may be important to consider if the tool is able to create sufficiently effective and engaging videos and/or simulations, or perhaps, personalized learning paths, rich media content, simple slides or mobile apps.

The following are some important factors to consider in order to make the right choice. Items are not ranked according to their importance and the list is not exhaustive; many other decisive elements (such as localization abilities for multilingual content or mobile device output) could also be examined

Authoring features and functions

The starting point when it comes to a tool selection is to create a requirement list, grouping all must-have prerequisites and functions required to support desired instructional patterns. If an organization opts for its own code-based authoring tool, the requirements list may serve as the software requirements specifications. For off-the-shelf solutions, the must-have requirements list can be compared with the products' features.

Ease of use

The more user-friendly and intuitive an authoring tool is, the more likely that a pool of potential authors can grow. In this context, a good combination of rapid functional advantages that do not require advanced technical knowledge may speed up the production process and facilitate educators when creating content that meets evolving learner needs.

Packaging formats

This feature determines the way that learning content is delivered and made ready to be consumed by the end users. The output format should be packaged to run smoothly, not only on the organization training delivery infrastructure,

but also on the user operating system and browser. Output packages are mainly determined by an organization's training delivery methods and needs. Options may include SCORM packages for training methods via LSM; CD-ROM or printable formats to reach learners with low or unstable connectivity; and offline mobile learning apps for a workforce travelling in remove locations. Video (or work-related video) that combines visuals with learning information can be a strategic method to increase retention levels.

Mobile learning is a relatively new delivery method for 'anytime, anywhere' learning. According to the current trends and growing demand, learners expect an identical browsing experience on the multiple end devices that they use (PC, tablet or smartphone). In order to fulfil learners' expectations, it is important to consider whether content can be delivered satisfactorily on any or all of these devices.

Collaborative or individual authoring

Some complex development projects require centralized development in terms of multiple author collaboration, as opposed to individual authoring and sequential tasks. Similarly, a good production workflow must support content creators to interact and share content and collect consolidated feedback from reviewers, SMEs and other stakeholders. It is also worth considering whether to choose a collaborative or individual workflow system, as this not only determines the installation type of the potential tool, but can also streamlines the review/approval process and cut down on production time.

Courseware production team

The number of team members, their skillsets and ability to handle different tasks are decisive factors when it comes to selecting or developing the tool. Rapid authoring tools covering all authoring needs are ideal for tight budgets, quick turnround projects, and/or teams without dedicated specialists in courseware design. Certain training formats or complex custom interactions require the use of highly specialized tools with a steep learning curve. This means that content creators may have to invest time in becoming proficient in performing a wide range of actions and understanding a tool's full potential. The adoption period can be quite challenging for creators, who will slowly progress to more complex authoring tiers as their skills mature.

Part III: Creating e-learning content

Creative authoring

This feature refers to the ability of a tool to accommodate a variety of interactions, navigation elements, branching, quizzes and other instructions in course design. Highly customizable tools facilitate the creation of elaborated content in a fast and easy way, allowing course creators to build a more sophisticated learning experience. Conversely, tools with poor customization capabilities can impose constraints on instructional creativity.

Integration

This specifies whether a tool is compatible with leading LMS and/or other software, such as PowerPoint, or other media programmes and tools.

11.0 In summery

Key points for this part

1. The knowledge required to create an e-learning course can be collected from existing source materials or created from scratch.

2. In both cases, some interaction with subject matter experts may be required, either to obtain the core content, specific inputs or expert review.

3. It may be useful to provide some guidance to subject matter experts in their role as authors of e-learning content.

4. Once the content has been assembled, the instructional designer will create a storyboard by integrating several instructional techniques.

5. Analysing the different types of knowledge elements to be included in an e-lesson can help the instructional designer to present the content effectively, so as to facilitate understanding by learners.

6. Using examples is crucial, especially where conceptual knowledge has to be understood, as they can help to bridge the gap between theory and practice.

7. Practice and assessment tests facilitate the achievement of learning objectives. In self-paced e-learning, practice exercises and tests mainly consist of questions linked to response options and feedback. Questions should be created for critical topics or tasks, and should use explanatory feedback to reinforce learning.

8. Different media can be used to illustrate content. It is essential to use them appropriately to avoid overloading the working memory of learners.

Part III: Creating e-learning content

9 A range of instructional techniques can be used to present content. You may want to add gamification features or a pedagogical agent to guide the learner through the content and add a human presence. Alternatively, you can use techniques aimed at developing skills, such as storytelling, case- based scenarios and serious games, demonstration-practice methods, or even a toolkit approach to support rapid information finding.

10 Courseware development may involve the creation of graphical layout for the course, the development of media and interactivity for each screen, and quality assurance testing.

11 Nowadays, a variety of tools support course creation, as well as the development of specific media features.

12 When selecting your authoring tools, consider important factors such as team expertise, development costs, desired output, creative freedom and community.

Part IV

Managing and Facilitating the Technical and the On-job Training

TRAINING OVERVIEW:

The E-learning techniques training divided into two batches, first batch was on two waves, 1st wave the theoretical phase and 2nd wave the practical phase. Second batch was the technical training, which is 3rd wave.

Part IV: Managing and facilitating the technical and the on-job training

HCWW ON-JOB E-LEARNING TRAINING SCHEDULE - 1st Wave (Theoretical)

Day 1: Wednesday 10th November: "E-Learning Development Part 1"

Topic	Speaker	Duration		Venue
		From	To	
• Advanced interactive content elements • Triggers and Variables • If) Functions	Eng.Ibrahim Asaad	10:00 AM	1:00 PM	UMAMI Office

Day 2: Thursday 11th November: "E-Learning Development Part 1"

Topic	Speaker	Duration		Venue
		From	To	
• JavaScript execution • Customizing Player and final HTML file • Publishing with different SCORM versions	Eng.Ibrahim Asaad	10:00 AM	1:00 PM	UMAMI Office

Day 3: Sunday 14th November: "E-Learning Development Part 2"

Topic	Speaker	Duration		Venue
		From	To	
• Animation video production principles (infographic videos) • Adobe After Effects main screen • Key frames principle and applying effects	Eng.Ibrahim Asaad	10:00 AM	1:00 PM	UMAMI Office

Day 4: Monday 15th November: "E-Learning Development Part 2"

Topic	Speaker	Duration		Venue
		From	To	
• Render and compressing • Adobe Edition overview Audio files editing (volume optimizing , Noise reduction, mixing tracks)	Eng.Ibrahim Asaad	10:00 AM	1:00 PM	UMAMI Office

Day 5: Sunday 21st November: "Practical"

Part IV: Managing and facilitating the technical and the on-job training

HCWW ON-JOB E-LEARNING TRAINING SCHEDULE - 2nd Wave (Practical)

1st Week
From: Sunday 9th January
To: Tuesday 13th January

Topic	Speaker	Duration		Venue
		From	To	
"E-Learning Development Part 1 Practical" • Advanced interactive content elements • Triggers and Variables • If) Functions	Eng.Ibrahim Asaad	10:00 AM	5:00 PM	UMAMI Office

2nd Week
From: Sunday 16th January
To: Tuesday 20th January

Topic	Speaker	Duration		Venue
		From	To	
"E-Learning Development Part 2 Practical" • Animation video production principles (infographic videos) • Adobe After Effects main screen • Key frames principle and applying effects	Eng.Ibrahim Asaad	10:00 AM	5:00 PM	UMAMI Office

Part IV: Managing and facilitating the technical and the on-job training

HCWW ON-JOB E-LEARNING TRAINING SCHEDULE - 3rd Wave (Technical)

Day 1: 27th February 2022
"Introduction to the E-learning"

Topic	Speaker	Duration		Venue
		From	To	
1- Introduction to the E-learning: • Overview of the current eLearning trends • Tools to use to create eLearning solutions	Dr.Hatem Askar	10:00 AM	2:00 PM	Blue Ocean Co. Working Space

Day 2: 28st February 2022
"How to design an interactive learning experience"

Topic	Mentor	Duration		Venue
		From	To	
2- How to design an interactive learning experience: The Instructional Design Process • Types of learning activities • How to write a storyboardPrinciples of gamification		10:00 AM	5:00 PM	UMAMI Office

Part IV: Managing and facilitating the technical and the on-job training

Day 3: 1st March 2022
" Articulate Storyline Essentials "

Topic	Mentor	Duration		Venue
		From	To	
3- Story Line Essentials • Creating e-learning courses with Articulate Storyline • When is story line is best tool • E-learning best practices • Previewing the work • Creating layers and setting triggers • Quizzing best practices • E-learning techniques in visual design • How to review a developed course • Advanced interactive content elements • Customizing Player and final HTML file basics • Triggers and Variables basics	Eng.Ibrahim Asaad	10:00 AM	2:00 PM	Blue Ocean Co. Working Space

Day 4: 2nd March 2022
" Instruction Design Essentials "

Topic	Mentor	Duration		Venue
		From	To	
4- Instruction Design Essentials: Models of ID & Story Boarding • Recall the features of backward design. • Essential models of ID • Identify the emphasis of andragogy. • Name the characteristics of an online learner. • Explain how to determine instructional tone. • Recognize examples of accessibility. • Recall which gamification strategy empowers learners almost immediately	Ms. Mona Kharat	10:00 AM	2:00 PM	Blue Ocean Co. Working Space

Part IV: Managing and facilitating the technical and the on-job training

Day 5: 3rd March 2022
"Animation Essentials"
"LMS Administration"

Topic	Mentor	Duration		Venue
		From	To	
5- Animation Essentials: • Animation video production principles (infographic videos) • Key frames principle and applying effects • Render and compressing basics • Audio files editing basics (volume optimizing, Noise reduction, mixing tracks).	Eng. Maged Hussein	10:00 AM	2:00 PM	Blue Ocean Co. Working Space
6- LMS Administration: • Understanding LMS concept and LMS types • Creating Courses and uploading the materials • Quizzes and assignments • Creating Users and users enrollments • User roles • Reports 7- Lessons learned from Task 1 classic course material conversion	Dr.Hatem Askar	10:00 AM	2:00 PM	Blue Ocean Co. Working Space

Part IV: Managing and facilitating the technical and the on-job training

Target Candidates

- To support the Egyptian Holding Company for Water and Wastewater (HCWW) in achieving its results, as part of the technical assistance provided by USAID under the Integrated Water Solutions Support Technical Assistance (IWSSTA), UMAMI E-Learning Solutions initiated a technical training to HCWW Staff in cooperation with USAID/Egypt.

No. of Participants

- First Batch consists of two participants from the Holding Co. For Water & Wastewater - HCWW have been accomplished the on-job e-learning training provided by UMAMI E-Learning Solutions.
- Second Batch consists of 12 participants from the IT Department at Holding Co. For Water & Wastewater - HCWW from different governorates (Minya, Assiut, Sohag, Qena, and Luxor) have been accomplished a training on "E-learning and Digitization Concepts and Methods" provided by UMAMI E-Learning Solutions.

Course's overall objectives

1st Batch objectives

- Gaining experience about the SCORM packages and how to generate reports from the learning management system.
- Gaining the know-how of how to maximize the engagement levels in any e-learning course.
- Know the authoring tools that are used in the e-learning course
- Successful application if the animation and infographic tools.
- The principles of the design and its elements.

2nd Batch Objectives:

- Define E-Learning and digitization concept & practices
- Know Instruction design process and how to organize an instruction design document
- How to define the classic material scope, main topics
- Highlight the areas for illustrations, animation, interactive exercises
- How to select the proper tools for implementing the e-learning conversion
- How to properly design the interactive course structure and design process
- Lessons learned from task 01 classic course material conversion

Course Provider

- UMAMI E-Learning Solutions provide their solutions for Holding Co. For Water & Wastewater (HCWW) to train a selected group of HCWW employees to set up a staff line capable of performing the digitization for the remaining training materials internally by the IT department in HCWW.

Part IV: Managing and facilitating the technical and the on-job training

The course contain

1st Batch - First wave (Theoretical)

- The training covers the following topics

1. E-learning Development (Part1).
2. E-learning Development (part2).

1st Batch - Second wave (Practical)

- E-learning Development (Applied)

2nd Batch - Third wave (Technical)

- The training covers the following topics:

3. Introduction to the E-learning.
4. How to design an interactive learning experience.
5. Articulate Storyline Essentials.
6. Instruction Design Essentials.
7. Animation Essentials.
8. LMS Administration.

2nd Batch Training Arrangement

- Venue Reservation.
- Media Coverage.
- Participants Laptops.
- Preparing Trainees IDs.
- Preparing training Handout.
- Preparing Coffee Break.
- Participants Name Tag Stand.
- Preparing training attendance & feedback and Pre& Post Assessment.
- Training Printout (Roll Up, Notebooks, Material, Certificates, Certificates Holders)

FIRST BATCH TRAINING PROGRAM

1st WAVE PROGRAM (THEORETICAL PHASE)

Day 1

Wednesday 10th November 2021

- 1st day start by the registration, attendance, pre-assessment and course curriculum.
- Then, Introduction overall the course with Dr.Hatem Askar- UMAMI Chief Technical Officer
- 1st day leaded by Eng.Ibrahim Asaad - UMAMI Project Coordinator, discussed the advanced interactive content elements, triggers & variables.
- Closing the day with taking the feedback about overall the day.

"E-Learning Development Part 1.1"

Day 2

Thursday 11th November 2021

- The 2nd day Eng.Ibrahim has continued the 1st part of the e-learning development, explained what is javascript execution and how to customizing the HTML file and finally, how to publishing with different SCROM versions, Also discussed the animation and adobe illustrator, Eng.Ibrahim discussed the animation production principles with infographic videos, and how to use the adobe after effects.
- Finally, take the feedback about overall the day.

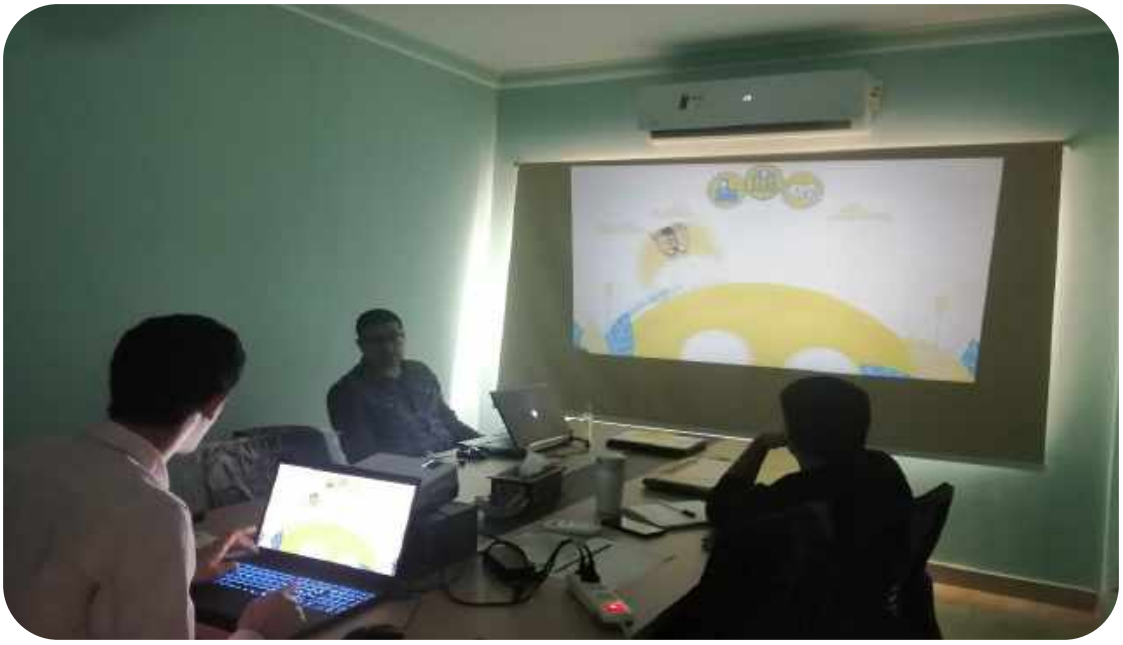
Part IV: Managing and facilitating the technical and the on-job training

"E-Learning Development Part 1.2"

Day 3

Sunday 14th November 2021

- The 3rd day was the second part of the e-learning development; Eng.Ibrahim discussed the key frames principles and how to apply effects.
- The second part of the day was an overview about the adobe edition; Eng.Ibrahim clarified how to render and compress an animation video and how to edit an audio file.
- Finally, Eng.Ibrahim discussed the difference between the 3D and 4D and applied by animation videos.
- Moreover, closing the day with the feedback.



"E-Learning Development Part 2.1"

Part IV: Managing and facilitating the technical and the on-job training

Day 4

Monday 15th November 2021

The fourth Day was about the design; Eng.Ibrahim discussed the principles of the design: Emphasis, Balance and Alignment, Contrast, Repetition, Proportion, Movement and White Space. Also discussed the design elements like: Line, Texture, Color, and Space. We close the day by taking the feedback and post-assessment.

Day 5

21st November 2021

The 5th and final day was the practical day, Eng. Ibrahim gave an assignment project to every trainee to apply what they have learned, the project was about" Mechanical Maintenance Technician Training Program", with the USAID and finally closing the training with Eng.Ibrahim Asaad.

Part IV: Managing and facilitating the technical and the on-job training

Trainees Assignment Project

Ahmed Ghazaly Project

To watch all the project:
https://drive.google.com/file/d/1iY67UltG9JU7j8NgcDyWEwt9y1NARbYn/view?usp=sharing

Part IV: Managing and facilitating the technical and the on-job training

Ahmed El-Emam Project

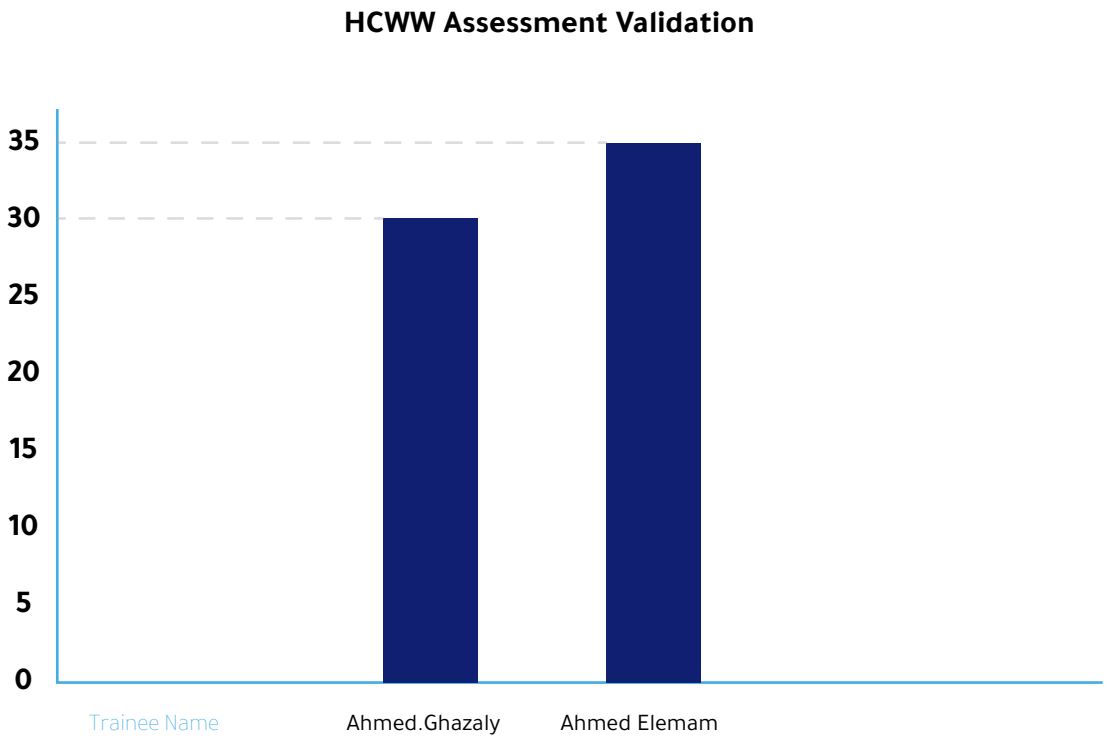
To watch all the project:
https://drive.google.com/file/d/1dwwtSPFVsSIISN_Lyuq926HJ8HjoDH4N/view?usp=sharing

Conclusion

- Eng.Ibrahim closed the training by thanking the participants, and the USAID for this initiative and the collaboration, wishing the continuity of this relationship, the fruitful cooperation and successful e-learning initiatives.

Part IV: Managing and facilitating the technical and the on-job training

Trainee	Pre- Assessment - 20	Post- Assessment & Project - 40
Ahmed.Ghazaly	0	29
Ahmed Elemam	0	33



2nd WAVE TRAINING PROGRAM (PRACTICAL PHASE)

- After discussing the Articulate Storyline principles and the animation principles with Eng. Ibrahim, the participants moved to the next step in the e-learning training, which is practice and applying all the knowledge and information they have gained along the training.

- Eng. Ibrahim walks through the most important aspects of creating e learning in Storyline. He details the full process from idea to delivery, covering key features like slide creation, building in interactions, and deploying e learning. He also shows how to insert common assets like text, audio, images, characters, and video, along with tips on how to get the most out of the quizzing features in Storyline. Beyond
- software features.
  In addition, they applied the gamification principles, and create a game from scratch.
- The participants applied how to insert quizzes in a course in an interactive way.
- The practice includes the branched scenarios and haw to develop it.
- In addition, they learn how to choose the appropriate sound effect and VO based on the course type and the target audience.
- Finally, applying the animation principles with the GIF.

Part IV: Managing and facilitating the technical and the on-job training

Participants Animation Work

https://drive.google.com/drive/folders/1_a3J8clSSabhbziZYtLYP2bbdCB0x86X?usp=sharing

Training Practice Outcome

The participants practice on

- Build engaging slides with media including audio, video, and graphics.
- Create interactive slides including click-to-reveal interactions, knowledge questions, and custom interactions using actions and variables.
- Record your screen for sit-back-and-watch demonstrations or interactive practices.
- Customize the player interface and incorporate custom navigation.
- Publish your project, including publishing for mobile devices.

Conclusion

- Eng.Ibrahim closed the training practice stage by thanking the participants, and the USAID for this initiative and the collaboration, wishing the continuity of this relationship, the fruitful cooperation and successful e-learning initiatives.

SECOND BATCH TRAINING PROGRAM

3rd WAVE PROGRAM (TECHNICAL)

Day 1

Sunday 27th February 2022

- 1st day start by the registration, attendance, pre-assessment, course handout and course curriculum, and opening the training under the supervision of **Dr.Alyaa Awad**- Monitoring & Evaluating Manager at USAID.
- Then, Introduction overall the course with Dr.Hatem Askar- UMAMI Chief Technical Officer
- First day leaded by Dr.Hatem Askar - UMAMI Chief Technical Officer, introducing the ELearning, discussed the difference between "Synchronous learning' and "Asynchronous learning".
- Then D.Hatem Askar discussed the current eLearning trends, like: Mobile Learning, Social Learning, Augmented Reality and Virtual Reality, Micro learning, Video-Based Learning, Adaptive Learning, Artificial Intelligence, Gamification and Game-Based Learning, Content Curation.
- In the 2nd part of the day, Dr.Hatem Askar discussed the tools to use to create eLearning solutions and the power of e-learning, and the key reasons for companies to adopt education tools, so he discussed Types of authoring tools such as: Text processing, Image and Graphics processing, Animation, Video processing, HTML/CSS/XML editor, Content Sharing, Collaboration, Video Conferencing, Interactive Whiteboard software and CMS and Monetization, and lastly discussed the Customized eLearning authoring tools.
- Closing the day with taking the feedback about overall the day.

"Dr.Alyaa Awad with Dr.Ahmed Seif - Chief Operating Officer & Dr.Ahmed Ghonim - Chief Business Development Officer"

Part IV: Managing and facilitating the technical and the on-job training

"Dr.Hatem Askar - Chief Technical Officer with Introduction to the ELearning"

Day 2

Monday 28st February 2022

- The 2nd day was about how to Design an interactive learning experience with Ms. Mona Kharat- UMAMI Senior Instructional Designer, started the day with the meaning of the instructional design, and explained the instructional design process steps: Analyze Requirements with its items (Business needs, Learner profile, Content, Technology).
- Then Ms. Mona kharat discussed how to Identify Learning Objectives, and how to distinguish between the 'good-to-know' and 'must-know' content, then discussed the steps to Develop Design.
- In the 2nd part of the day, the discussed how to create a storyboard, and applied with an activity in which each one of the participants create a story from their point of view based on the sequence of events.
- Discussed the Types of learning activities (Offline-Online), last but not least, they discussed the Principles of gamification, lastly Ms. Mona discussed the Instruction Design Essentials: Models of ID & Story Boarding:
  - The features of backward design.
  - Essential models of ID (The ADDIE Model, Bloom's Taxonomy).
  - The emphasis of andragogy.
  - The characteristics of an online learner.
  - How to determine instructional tone.
  - Lastly the Gamification Strategy.
- Finally, take the feedback about overall the day.

Part IV: Managing and facilitating the technical and the on-job training

"Ms.Mona Kharat - UMAMI Discuss the Instructional Design Process

Day 3

Tuesday 1st March 2022

- The 3rd leaded by Eng.Ibrahim Asaad- UMAMI Production Manager, discussed how to create e-learning courses with Articulate Storyline, and when is story line is the best tool, explained the E-learning best practices, and previewing the work, how to create layers and triggers setting, lastly clarified the quizzing best practices.
- In the 3rd day, **Eng. Felipe Kamel** - HCWW IT Manager addressed the HCWW staff, and clarified the objectives of this initiative and the goals of the training, which we aim.
- Moreover, closing the day with the feedback.

Part IV: Managing and facilitating the technical and the on-job training

"Eng.Felipe addressed the HCWW staff"

"Eng.Ibrahim Asaad - Production Manager Discuss the Storyline Essentials"

Part IV: Managing and facilitating the technical and the on-job training

Day 4

Wednesday 2nd March 2022

- The fourth Day was about the E-learning techniques; Eng.Ibrahim Asaad continued discussing E-learning techniques in visual design, then discussed how to review a developed course. Moreover, Eng.Ibrahim explained the advanced interactive content elements, and how to customize player and final HTML file basics, lastly the triggers and variables basics.
- The 2nd part of the day was the practical phase, the participants applied the knowledge they gained throughout the training, Eng. Ibrahim gave an assignment project to every trainee to apply what they have learned, the project was about" Information Security Training Program".
- Lastly, closing this part with the feedback.

"Eng.Ibrahim Asaad - Production Manager Discuss the 2nd part of Storyline Essentials"

Day 5

Thursday 3rd March 2022

- The 5th and final day was the Animation Essentials, the last day presented by Eng.Maged Hussein - UMAMI Senior Animator, explained the animation meaning, then discussed the types of animation (traditional, stop motion, motion, 3D).
  In the 2nd part of the day, Eng.Maged discussed the animation video production principles (infographic videos) (Squash and stretch, Anticipation, Follow through and overlapping action, Slow in and slow out, Timing).
  In addition, the key frames principles and how to apply effects.
- Then Eng.Maged explained the Key frames principle and how to apply effects, and clarified how to render and compress an animation video explained the audio files editing basics and how to edit an audio file.

Part IV: Managing and facilitating the technical and the on-job training

- In the practical phase, Eng.Maged assigned a project to each one of the trainees to apply the animation principles, which they discussed.
- Finally, closing the training with the feedback and take testimonials from the participants and Dr.Alyaa Awad regarding overall the training (Organization, Facilities, Material, Instructors).
- Then Dr. Hatem Askar and Dr. Alyaa Awad handover the training completion certificates to the participants, and celebrate the success of the training with achieving the target goals.

"Eng.Maged Hussein - Senior Animator Discuss the Animation Essentials"

Part IV: Managing and facilitating the technical and the on-job training

Trainees Assignment Project Sample:

To watch all the participants projects

https://drive.google.com/drive/folders/1_ZrB_e4K7JOjdWGKsjqstJ_058CkQo6-?usp=sharing

Conclusion

- Dr.Hatem Askar - UMAMI Chief Technical Officer and Dr.Ahmed Seif- Chief Operating Officer, closed the training by thanking the participants, and the USAID especially **Dr.Alyaa Awad** - Monitoring & Evaluating Manager at USAID - for this initiative and the collaboration, wishing the continuity of this relationship, the fruitful cooperation and successful e-learning initiatives

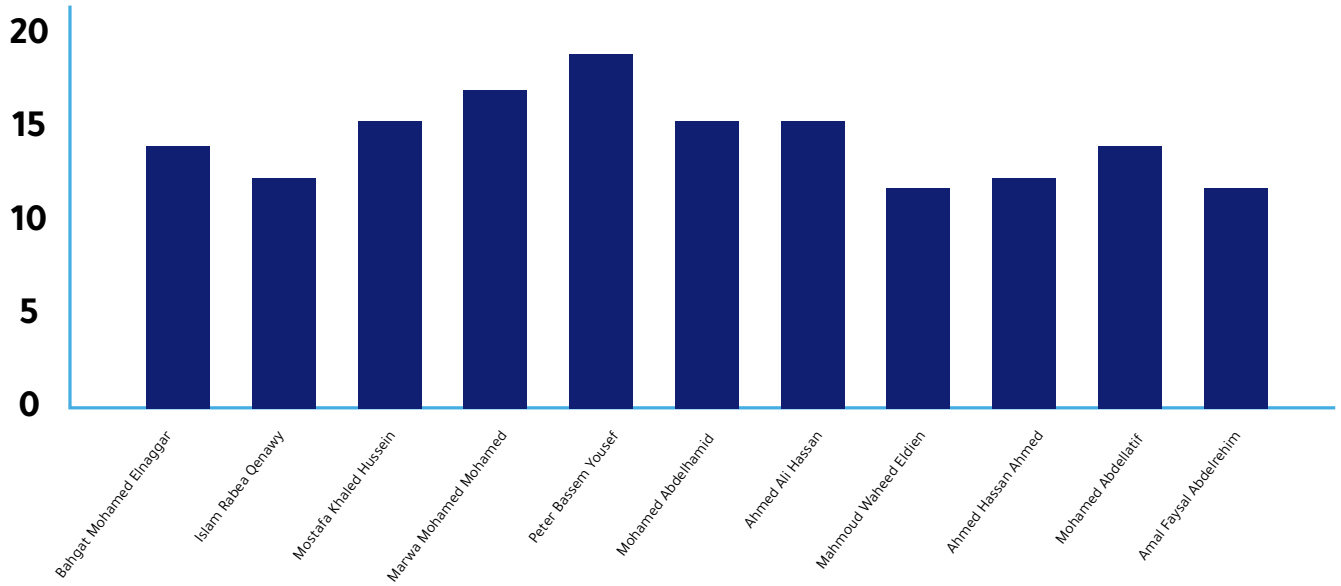
Participants Projects Validation

Trainee	Pre- Assessment - 20	Post- Assessment Project - 20
Ahmed Darder Abdelaziz	0	-
Bahgat Mohamed Elnaggar	0	14
Islam Rabea Qenawy	0	13
Mostafa Khaled Hussein	0	15
Marwa Mohamed Mohamed	0	16
Peter Bassem Yousef	0	18

Part IV: Managing and facilitating the technical and the on-job training

Mohamed Abdelhamid	0	15
Ahmed Ali Hassan	0	15
Mahmoud Waheed Eldien	0	12
Ahmed Hassan Ahmed	0	13
Mohamed Abdellatif	0	14
Amal Faysal Abdelrehim	0	12

2nd Batch Assessment Validation



The Top 5 Participants Assessment

Trainee	Company	Assessment Percentage
Peter Bassem Yousef	Asyout	90%
Marwa Mohamed Mohamed	Asyout	80%
Mostafa Khaled Hussein	Asyout	75%
Mohamed Abdelhamid	Menya	75%
Ahmed Ali Hassan	Menya	75%