

MODULE 16

E-LEARNING TOOLS AND MEANS

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OBJECTIVES

The e-learning network and platforms allow conveying complex training tracks, through the use of media and channels of different communication.

The matter dealt with here aims at introducing, in an absolutely general way, the main principles of the technologies that underlie the functioning of Internet and world wide web, for the purpose of making the student aware of the potential of the tools he/she has at their disposal.

E-LEARNING TOOLS AND MEANS

Technologies: from paper to the net...

Digital technology has put on the carpet the traditional transmission criteria of information through physical support means: a new phase in communication processes has dawned, and we are witnessing the passage from a culture that sees the printed book as the paramount tool of the spreading of knowledge, to forms of culture where knowledge is conveyed through non print support. The first experiences of distance learning went exactly in this direction which tried to give an answer to the need of reaching users geographically far from the site of training delivery, putting the technologies used in radio-television broadcasting on the market.

The phenomena of transition from paper format to electronic format have invested a wide range of document types: large encyclopaedic works, periodicals, specialistic literature, archives and data banks of various type.

Technology has allowed, in fact, the transposition in digital format of texts conceived originally for the traditional paper support, has produced new formats for publishing and new modalities of use of documents.

Consequently, an important change has turned up in the didactic approach to the materials to arrange for use on the net and in the problems linked to the learning modalities, whose peculiarities is faced in **module X**.

The most innovative reach, however, affects accessibility of information: the documents in electronic format can circulate in the net from one point to another of the planet in real time. The transmission and the recovery of information are, therefore enormously simplified.

CD-ROMs and DVDs, optical disks capable of containing large quantities of data easily accessible, marked the sensitive moment of passage from the possession of documents to that of access to information.

With their wide scale spreading, thanks also to publishing initiatives linked to the world of traditional information (the press), familiarity with the personal computer and consulting modalities of material in digital format became widespread.

Today CD-ROMs are basically considered antiquated, if you consider the infinite potential of the net in terms of availability of resources and constant updating of data.

Now, one of the most used transferring data systems are USB Flash drives. They are new storage systems with small dimensions and shock protection which put portable Flash memory in everyone's hands. They are reliable and easy to use due to securely storing, carrying and transferring data.

The consolidated modalities of learning linked to the fruition of documents on paper support, will be overtaken only when we start witnessing the massive spreading of computers and digital technologies even in entire school systems.

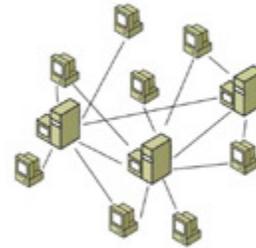
Internet, the network

A network is a group of two or more computers linked together.

There are various types of networks and they are differentiated, not only in the number and geographic distribution of the computers linked together, but by the logic with which they are designed and by the technology with which they are realised.

Internet can be seen as the network of networks, that links together in the entire world thousands of networks based on heterogeneous technologies and infrastructures, capable of communicating together thanks to a common language: a set of shared rules that allows exchanging data among linked computers.

INTERNET NET



A strong point of internet lies exactly in its use, for communication among computers, of a common protocol called TCP/IP – acronym for Transmission Control Protocol/Internet Protocol - a managing logic of linking and traffic of data shared by all the computers linked together.

Internet, in addition to being based on the use of the TCP/IP protocol utilises the client-server architecture for the managing of the interactions among computers.

The user through his own client application, typically a browser, communicates with the resident server application on a computer linked to the internet, sending it a request. The server application controls the possible authorisation to access, verifies the syntactical correctness of the message received, recovers from its own hard disks the information requested, if necessary reprocesses and sends the reply to the user.

Once at the client's, the data becomes reprocessed again so it can be viewed by the user, then the system goes back in stand-by till a new request is issued.

The interactions between client and server, in turn, are based on a common language, a specific applicational protocol for each network service.

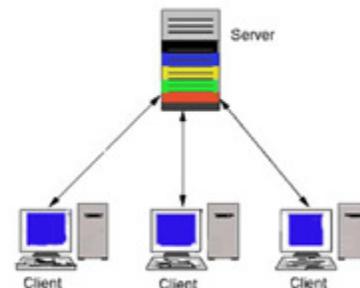
A few examples:

Simple Mail Transfer Protocol (SMTP) manages the client-server interactions for electronic mail.

File Transfer Protocol (FTP) is used for transferring files among computers linked to the net.

Hyper-Text Transfer Protocol (HTTP) is the protocol on which the World Wide Web is based.

CLIENT-SERVER SYSTEM



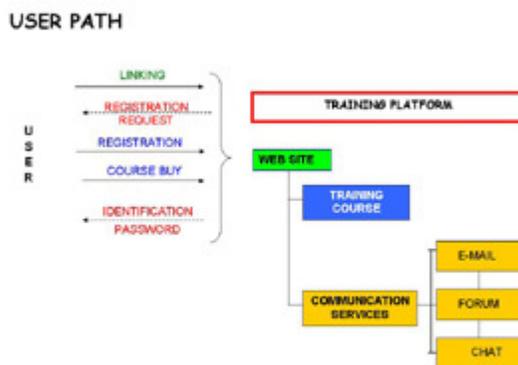
Summing up, in order for requests and messages to be conveyed through the network and reach the correct destinations, the applicational protocols must be based on the network protocols of TCP/IP and on DNS (Domain Name Service). DNS is the system of symbolic addressing that allows associating character strings (thus actual names) to numeric strings – physical addresses – that identify a host, a computer permanently linked to the net.

E-LEARNING PLATFORMS

E-learning platforms are applications that allow to develop and convey complex didactic tracks, availing themselves of the communication possibilities and interaction offered by the network.

There are many platforms available on the market, and they are differentiated for the technological and methodological standards they belong to, for the specific tools dedicated to the production activities in progress, for the typology of services offered at the level of communication, for the online training management tools, for the type of interface, for the usability level.

The variables in act are many, but in the complexity and heterogeneity of the various tools, you can trace common characteristics and functionalities, especially on the side of the user.



Let's try to sum up the process that the user must follow in order to use an online training track.

The user connects to the School's web site that delivers the on line training, enrolls, formalises the purchase of the courses he/she wants, and obtains an user ID and password with which he/she can enter into the restricted area for the fruition of the courses purchased.

At the same time, he can use the communication services available on the platform, usually e-mail, forum and chat, that allow him to contact other users, the tutor, the admin office (and any other figures made available by the School), to obtain didactic support, exchange opinions and retrieve information.

The e-learning platform, through communication services, allows creating actual virtual communities, promotes collaborative work and reproduces on a distance, the same social dimension of traditional training.

Naturally, technology by itself does not create relations, it is a knowledgeable use of communication tools that makes desired interactions in e-learning processes possible.

MEDIA

In origin content is shapeless, it is pure thought.

In going from the conception phase to that of communicating content, you must choose a means, a tool.

The choice of the media depends on the type of content we want to transfer, on the goals of the informative/training intervention, on the communication channel that will be used for content transfer.

Text

When we need to carry out a relationship on a given topic, we write a report.

Writing is the main activity with which we can fix content and text is the most used means for its transfer.

Written text for fruition on internet is defined hypertext. It is based on a reticular organisation of information and is articulated into units and connection between units.

Links allow to go from one unit to the next, or from one to multiple units.

When linked information is not conveyed only through text, but also through different types of media, the hypertext is defined as multimedia, and takes on the name of hypermedia.

Text is without a shade of doubt the lightest means, in terms of bytes and therefore of commitment of the band, for transmitting online content.

Images

Quite often, when we illustrate a particularly articulate concept, we draw diagrams so as to visualise the relations among the parts, to better describe cause, effects, priorities, flows and hierarchies. This use of illustrations is finalised to clarifying textual content.

An alternate use of illustrations is that relative to their evocative dimension.

Situations, ambiances, feelings, frame of mind, and all those mental representations that belong to the sphere of the intangible, can be evoked through an adequate use of images.

Images are contributions whose “weight”, in terms of bytes, depends on the coding format.

Internet pages almost exclusively use two formats of images: GIF and JPG

JPG format is for pictures and images with lots of colours and shades.

GIF format instead is for illustrations containing drawings with few colours and few shades.

The weight in Kb of images is a determining factor, in fact the higher it is the slower the navigation resulting.

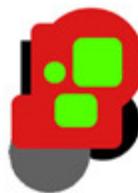
For example, the two images of these modules have a very different weight in Kb.

pippo.jpg weighs 30 Kb

pluto.gif weighs 3 Kb

MEDIA

TYPE	DIMENSION
Texts	100 kB
Pictures	From a few bytes to a few tens of Kb
Audio & Movies	Hundred of Kb
Animations	Thousands of Kb



pluto.gif



pippo.jpg

Audio and video

Background sounds, an audio contribution that introduces a concept or explains it in full, a recorded interview and transmitted online, are without a doubt a help for the student, since they alternate reading to listening.

In the same vein, film clips are a contribution of effect, which however repurposes the television model, that is a passive type of fruition, where the student cannot interact.

If used with parsimony they make the product quite captivating.

Inserting audio and video contributions entail an analysis of technology used by the user, from the hardware equipping to software (from speakers, to the processor, to plug-ins, to bandwidth with which the user connects).

Today we manage to go around the problems relative to traditional transfer of audio and video content – that require the complete downloading of a file before being able to use the content – through the introduction of a technology that takes on the name of “data streaming”.

This system allows to send film clips or digital sounds under the shape of a continuing flow of data, that a client application is capable of interpreting in real time, little by little as that the data is received.

Animations

Animations and designed vectorial film clips, based on precise didactic criteria, with the purpose of simulating environments and activities, in addition to rendering fruition pleasant allow the user to interact with the training product.

Interest and concentration of the student are stimulated by the activity where he is involved, at the vantage of the learning faculty.

ASYNCHRONOUS AND SYNCHRONOUS COMMUNICATION

Asynchronous and synchronous

We have made reference many times to the types of allowed communicative interaction from internet and their importance in the e-learning processes

In asynchronous communication the players communicate in differed time, with an appreciable temporal deviation that separates the sending of the message, its reception and possible reply.

In synchronous communication the exchanging of messages occurs in real time.

Let's take a look now in detail on what the more widespread forms of communication are in the training tracks based on e-learning and where they differentiate.

COMMUNICATION MODE	COMMUNICATION	
	Asynchronous	Synchronous
EMAIL	x	
FORUM	x	
STATIC WEB PAGE	x	
DINAMIC WEB PAGE	x	x
CHAT		x
VIDEOCONFERENCE		x
INTERNET PHONE		x

Asynchronous communication

A static web document is a file that contains all the prearranged content of the person who drafted it. If the server receives a request relative to a static document, retrieves it on its own mass memory and sends it in view to the client.

Static web pages are of easy codification and are used when the content is not subject to frequent changes.

Synchronous communication

A dynamic web document, instead, is made up by content that the server, through the use of ad hoc technologies, retrieves on the database dynamically, automatically or in response to an interactive operation performed by the user. Let's consider search engines and all those sites whose content is subject to frequent updating that justifies the use of a database, tables containing information on the stock exchange, meteorological data, online newspapers, institutional sites.

E-mail

It is a asynchronous communication

Electronic mail was one of the first functionalities made available on the internet. Its usefulness is linked to the speed with which one can exchange messages.

In order for the exchanging of messages to occur through electronic mail it is necessary for the sender and receiver to have both on their e-mail address.

In distance learning platforms the address is normally assigned at the time of the course enrolment, and corresponds to a sort of post box housed by the informatic system of the platform.

Forum

Asynchronous communication

The forum reproduces the social dimension of a traditional classroom.

Students and tutors exchange messages publicly, in other words they hold conversations on topics of common interest, at a distance and choosing the more suitable times, with the opportunity of producing articulated, complex, reflections validated by any inquiries and new personal researches on the topic.

In this sense, added value that emerges from a careful use of the forums, in terms of building of knowledge is evident.

The main feature making the forum a type of asynchronous communication means, is that all debates remain online for the entire duration of the training intervention with evident benefits for all the students: they can read and send messages whenever they believe to be more suitable.

During debates that are held in a traditional classroom, words are subject to being forgotten, while in a telematic forum everything remains in writing and filed into a database. **The didactic importance becomes even greater where it is coordinated by a tutor that can keep the level of interaction high but also pick up the lines of the debate and bring the discussion within the preset topics avoiding risks of dispersion**

Static/dynamic web pages

In web pages, following the evolution of HTML standard, of the introduction of client server scripting languages, of java, you can reproduce both forms of communication.

As already identified in the section on technologies, the architecture on which internet bases its operation is of the client-server type.

The client sends a request, then the server processes it and responds.

An HTTP server can act in ways depending if the request received takes him to answer with a static web document or with a dynamic web document.

Chat

Synchronous communication

Textual chats allow actual 'conversations' between two or more people, through typing on the computer keyboard.

The server keeps track of all the users connected and when one of them write something, the message is automatically sent to everyone in real time (if traffic on the net does not cause slowing).

Use of chats in an e-learning training track, can be fruitful for brief lasting interventions limited to specialistic ambits, where an expert of content and didactic methodologies in the net, synthesises an issue, answers and details impromptu the actual questions asked by the students. It is hard for chatting to have the same training importance of a forum session, even if the prerogative of immediacy that distinguishes it brings it closer to our usual way of communicating. Without a doubt this may constitute an important factor within the scope of the objectives aimed at creating a community and enhancing the level of socialisation.

Videoconferencing

Synchronous communication

Videoconferencing repropose the model of interaction between people in presence. For this reason it is a potentially valid tool for exchanging among figures involved in a process of e-learning. Videoconferencing communication is not mediated by the written text typed on the keyboard, but it is direct, verbal with all the characteristics of presence communication. Feedback to solicitation is immediate, people can see posture, gesticulating and facial expressions of the speaker, listen to the person's tone of voice and register.

In order to connect in videoconferencing you must have specific hardware and software, even if the quality of the final result depends a lot on the type of internet connection you have.

The significant improvement of the algorithms of compression and the optimization of the distribution techniques, such as audio and video data streaming, the increase of the passing band of the lines and the increase of the speed of a modem, allow to improve the quality of the audiovisual services on internet.

As a matter of fact, we are still far from having, in our homes, an acceptable quality of a session for videoconferencing with training purposes.

Skipping images that follow without audio synchronization do not allow to fully understand the messages conveyed.

Telephony via internet

Synchronous communication

The opportunity of communicating via a computer, as during a normal phone call, is presently very little explored by the users of internet, but it is extremely interesting. Contacting one's own tutor in voice is an activity that reproduces a model of social interaction known to everyone, and for this reason extremely simple to activate.

Naturally, specific hardware and software are required, even fast internet connection, so that voice data hits the destination with a rhythm that does not disturb the normal communication flow.