

How to develop didactic units for interactive elearning

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How to develop didactic units for interactive elearning. Definition and rules

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Learning, internet, online teaching,
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ABSTRACT

In this researching paper we show a methodology for developing didactic learning units inside an organized online elearning system. With this goal, We define and get hierarchy all the necessary items to create leading and efficient virtual lessons and, so, we write a step by step guide to build organized knowledge units inside a elearning environment.

This handbook is the result of more than one year of working from our reseraching team, and comes from an actual selection of 500 students inside a virtual learning environment

In the baseline, we say that online teaching is a challenge for all people relationed to.

As a new subject among all the already existing subjects, need a fix both resources and persons and methodologies that allow a maximum improvement of all the things and an efficient way of getting all the goals of a subject. From Technology, and Communication, up to Education, there are several points of view of the same theme and We can use different individual goals to get a common target: learning

In this all complex and exciting world of online teaching there are several very important aspects, as educational system approach, support services in the relational environment, support material, and a large etcetera. Among them, with no doubt, didactic units of a learning course, are the working basic cell. And is used to be the big forgotten

In this paper We put into a systematic building methodology of didactic units,

leading to give an efficient and easy to do step by step scheme. If We land from a conceptual definition of all the system, with some well defined goals, and a well drawn guides, and the put of coherent well built didactic units is the final line to get and keep all the working fronts inside a elearning environment

Therefore, We show which are the goals and how to define them, the step of organizing and preplanning, the step of design, scheduled and writing of educational resources, the step of interactive software developing, and the step of course use and administration. From each of

them, We analyze its useful, We define all the layout descriptions and We plan some generic acting guides, very easy to put on different contents

INTRODUCTION

From a technical view, and keeping in our mind the previous paragraph, We show, as scheduled and hierarchical as possible, several aspects and building steps of an elearning course and of their didactic units
Designing educationalresources

1 About functionality and tracing

We have to stand several points around functionality, fitting them to every concrete case, of course:

About functionality

- students can post-it contents to go on later
- a teacher-tutor must be there and has to answer fast the questions
- a FAQ's list (Frequently Asked Questions) must be accessible and their linked answers

- students can manage an auto-checking system with true/false questions
- students can be evaluated with open questions and this evaluation must be commented by the tutor, not only with a single numbered qualification
- shorts, graphs, figures and introductions are needed, above all in the most difficult chapters

About tracing

- the main goal is a student to know exactly in which moment is, how many items left, how many items done, which are the relations among them...
- there must be a structured system with icons, item, post-its of something like that, as visual as possible, to show the status in a concrete moment and that allows come back to it in the future
- stats can be generated and managed about a course, the hole academic plan or a didactic unit, from checking and auto-checking, exams, lessons and so on

2 Pre-analysis to a distance learning course building

We can consider several steps in a development of an interactive software leaded to teaching:

- Step 1. Pre-organizing and planning, selecting technology, supporting and methodology
 - Step 2. Design, structure and writing of the educational resource
 - Step 3. Development of the interactive product and built-in into the system
 - Step 4. Course use and administration
- In this paper We focus in the second step We must work as in presence lessons. To evaluate a student, first of all, We must write the answer You want to get and, after that, We write the question for it. If We don't work this way, We can get a development and a final product very different from those We kept in our minds

3 Building a distance course. Designing and developing contents

Before all We have to choose a person or team for organizing and showing the contents in the best way for student to reach the final learning goals of the lessons. This way, this person or group of

persons is called "Contents Architect" This architect, script-writer is another name, must know the subject and the best learning resources for every canal (culture, organization, structure) and for every kind of student

Besides his own tasks, when finished, this content designer must work very close to the developing technology team to build and run the course

This second step is structured in three sub-steps:

- Substep 1. General design of the course
- Substep 2. Desing of the learning units
- Substep 3. Adding resources and final integration

The first substep (General design of the course) defines the title, subtitle, goals, X-ray of the students, previous requirements and teaching structure. We must write all learning goals, specific goals and the relationship among them. We say all the parts of the course, including bibliography, web links, glossary, help, and so on. In short, We must build the skeleton of the course. It's like scripting a block design or a flow charting The second substep (Design of the learning units) draws and writes every unit, every paragraph of the course. Grounded on the didactic and learning goals, student target, methodology, number of pages, support and so many other determinants, We start to write every unit, keeping in mind the previous built didactic structure It's like writing a literary script, word by word As the same time, It's the moment to start thinking of add-ons and resources (video, audio, images, links, files...). We can make relations between every unit and moment inside the unit and the best resource for it. It's, so, a layout book

In the third and final substep (Adding resources and final integration) We put the searching, sorting, selecting and mixing of

all the resources thought in the previous substep. Now, We have all: the general structure, the concrete structure, the add-ons, and We have to build all in one only

final document to be sent to the developing team

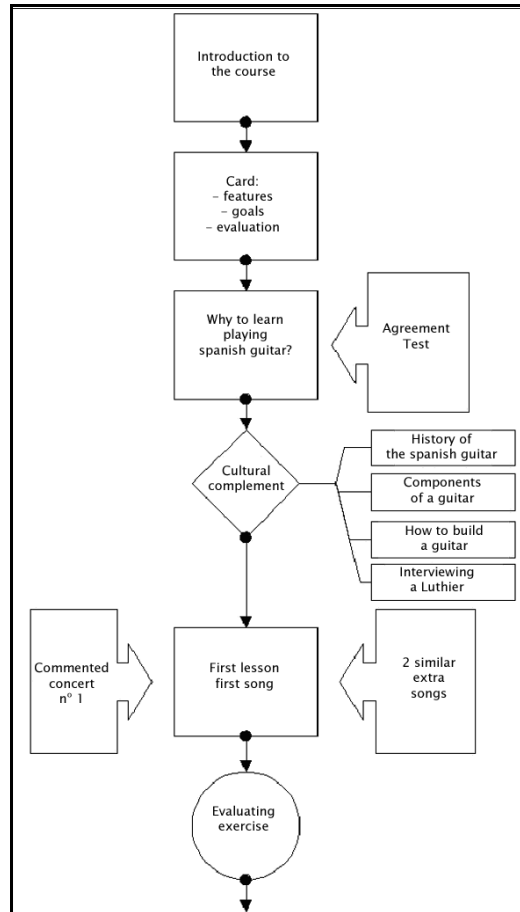


Figure 1. Flowchart or block diagram of an introducing course about Spanish guitar

3.1 Supporting resources and supporting means

Quality level of an interactive course is grounded on a detailed script, with a brilliant writing and on the addition and creative and efficient used of the available didactic means in a technological environment base on multimedia and Internet. These didactic means can be sorted in two main groups, depending on simultaneity of communication between teacher and students:

Asynchronous means: those which We don't need to work with people at the same time. User can access to this kind of resorts when he wants, allowing a very flexible way of following the course

Inside this class we can sort: text, form, document, drawing, picture, 3D animation, audio, video, electronic mail, discussion board, distribution list, news groups...

Synchronous means: those which have to keep a simultaneous interaction of two people at least. These users can be a tutor and a student or just students. In this class We find chat, videoconference, audioconference, shared blackboards, user computer remote control for teachers... A disadvantage of this sort of means is the necessary previous scheduled of the participants. This is the opposite profit to the asynchronous means, more flexible in users and timetable

We have to keep in mind that didactic means that We can finally use depend on

the available technological structure, for everybody involved: student, teacher and school

3.2 Substep 1. General design of the course
Point by point, suiting to every course, target and content:

a) Title

It must be short, clear, self-explicable and absolutely related with the main theme of the course

b) General goal

Which is the final goal of the course. When a student ends the last lesson what he is going to know to do, further than concrete exercises

c) Cast of characters

A short briefing of the participants, who are the final users, how are, which are their professions, how old are, which are their attitudes regarding the course...

d) Previous requirements

Whether students need to know something to login the course, as using a mouse, musical skills, english reading or anything else what without it a user cannot make the best use of the course

e) Specific goals and contents linked
Specific goals are contents or actions or skills that a student will learn with the course and that will be under evaluation and study

They must have always an specific weight and must be measurable: time, space, number of right answers...

Something to allow a measure of the student progression, participation and content assimilation level

Besides, these contents must be linked to specific goals. We can never write information without any final goal, because no particular reason. All role a function and it must be very clear: main content or second content, instance, a key...

Not even every content has a concrete weight. We cannot measure all. And We mustn't. For instance, additional resources, as notes, extra images, audio tips... are so important to get explained concepts stronger and fixer but they cannot have any further goal and maybe

they don't need a systematic evaluation process

f) Flowcharting

Contents, argument, relations, linked resources, add-ons, bibliography, web references, glossary, dictionary... All things which are necessary to build a well done skeleton

From this part of the job We have to get a detailed diagram of the course, to get clear the sequence and organization of it, called block diagram o flowcharting

3.3 Substep 2. Design of the learning units

a) Unit name and ID

The same thing as the general title for the whole course. Short and clean names, with an only identification that allows a right index for every unit

b) Content writing style

We have to plan the writing of all the content in the full text, to keep coherence for the unit

Exposition: the most often. We explain, in a simple and direct way, all the contents, including links and any else resource as a complement of the main concept

Exercise or evaluation: more important for confirming and re-read concepts than for an objective valuation of the student. It's a good starting point for the user to become aware of his level and of the data and concepts assimilation

Interactive animation and/or products: We force to a user to participate, choosing buttons, making decisions. If We can add images, visual attraction and a locution, We will have the best efficient way of learning, with the highest level of memory and the furthest

Activity: for single or group, with tutor o among students... In this point, the usual web services in a virtual campus, like discussion boards, chats, virtual classes, messages, etcetera, are essentials for a putting fresh air inside the life course. Online students suffer loneliness as the main deterrent for studying. Looking for the participation

of any student into the usual academic life and into the concrete linked activities to lessons/units/contents of an specific course helps the non didactic

aspect of a didactic product and grows the probability of studies ending in a good way

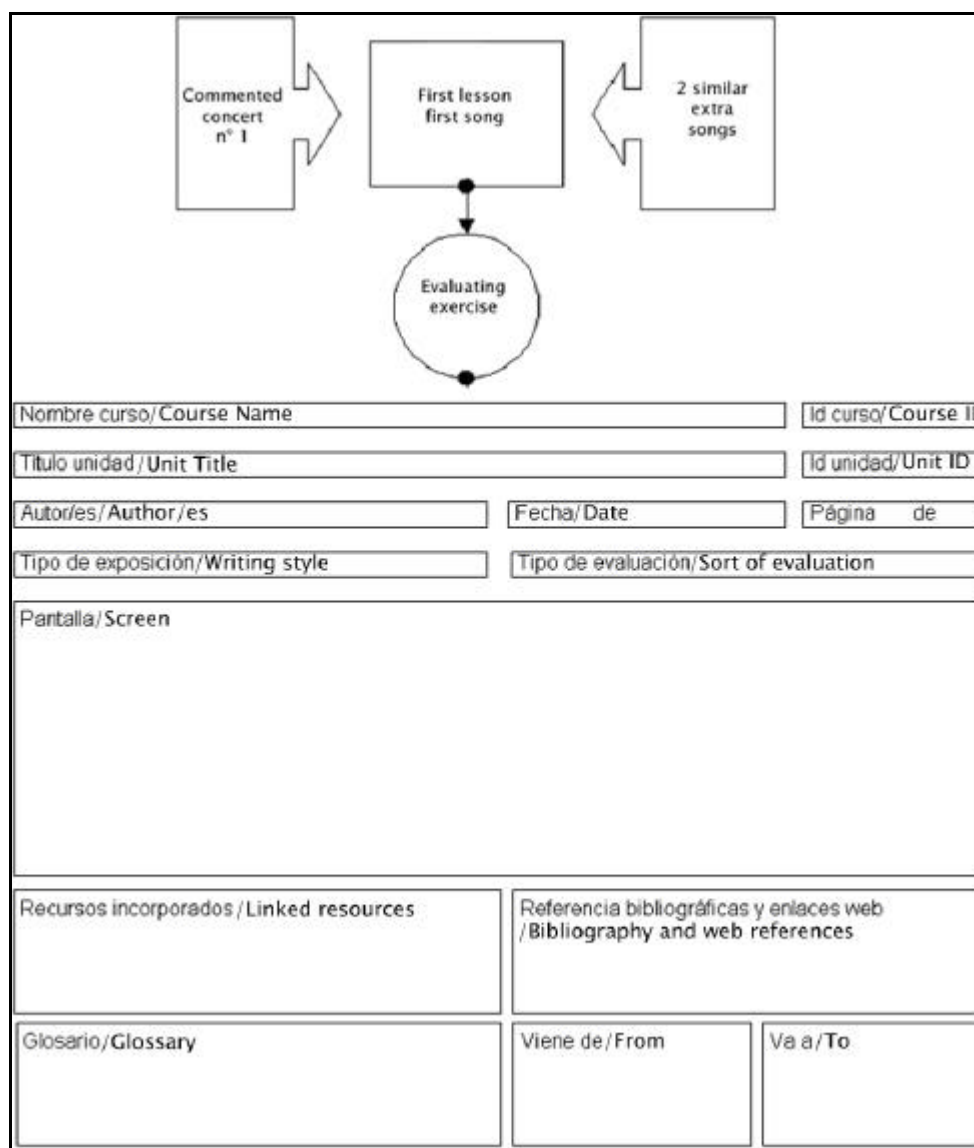


Figure 2. Pattern of a didactic unit

Some notes about creative writing of a didactic unit

We have to avoid to write the same, an interactive course and a book. In a website, or cdrom, We can add index navigations, images, animations, audios, locutions, self-correcting exercises, thematic discussion boards and a large etcetera. To read a paper is not the same than to read on a screen.

Here, It's more tiring and the reader has to have more rest times, besides being an endless font of entertainment

d) Planning the evaluating system

A very critical moment is the planning of the tests for measuring of student efforts and contents assimilation level

Writing a test, a control... (as called in primary school, whatever if You don't call it "exam") must have a sense and a goal (although I am not sure If in my primary school they have this so clear). So, It has to be another way of learning, besides a resource to know the level of a student and for him to know his own level

There are so many tests:

- close questions test. You answer yes/no
- open questions test. A kind of "what do You think of...?"
- multiple choices test. "Please, mark whatever answers You think are"
- couple of images related. For instance, www.mediometro.com
- creative writing in base of previous criteria
- researching work
- ...

The most important thing is to make the process well, the best, planned, with didactic goals, knowing what You want to get and why and which is the marking system and how is built

Feedback is a good mean of learning and multimedia technology makes it easier. This is, if the student get right We say why, and if He faults We also say why and add complementary information to consolidate the linked evaluated. This is also called positive support. Look, You cannot use negative words or offensive sentences that hurt more than help

3.4 Substep 3. Adding resources and final integration

a) Resources selection and its justifying
As we said, this substep doesn't have to be after the others. We can manage it at the same time. In a creative process is usual to mix the steps and It's not so strange to start from the roof to the floor. If finally It's all coherent, there is no problem. Psychology wises say (and old people with their ancient proverbs too) that first We decide and, after the decision, We put arguments on it. Although the selection of a resource has to

come from an educational necessity or from a supporting add-on (if the text is not the supporting add-on by itself) We can choose any from a feeling or from our intuition and, after that, put that selection into the general goals and into our educational planning

It's part of a creative process and this is more similar to an artistic job than a scientific one, although We must put the best of both together. There is not any trouble if, at the end, the result is coherent, consistent and good

What sort of resources can We use?

Let's reverse the question, which not? Books, handbooks, procedures, notes, tutorials, forms, evaluating series, guides, shows, previous courses, stats, diagrams, 3D images, videos, newspapers, magazines, concerts, conferences, animations, figures, music, locution, sound effects, rhythm patterns, spreadsheets, pictures, games, interactive products, polling, TV channels...

We have to keep in mind the course script and its argument, and We don't have to permit any resource to distract student and We have to consider all of the technical requirements and the rest of restrictions. If the user needs a runtime or a platform (like Macromedia Shockwave) and He hasn't got it, he will have to download it and he will lose the course sequence. Let's be careful with this. As far as technical restrictions, besides a clear and previous notifying, We have to be realistic and don't ask for more resources than usual, because We can find a lot of tracing problems following the course for the user. For instance, a streaming download of a video clip too large can block the system, or a fail showing and, so on, a let down of that user

We don't have to forget to justify the election. Sometimes, the most, It's enough with a little paragraph or an introducing sentence to link the text with the resource. If this is good and proper, this sentence uses to be self-explaining. It not, perhaps It would be nice to add an specific explaining to get clear why We are adding that resource

b) General considerations about supporting and complementing resources

- resources must support and complement, and don't distract. So, We have to look for elements according to the main information and to consolidate it
- messages must be short, clear and direct. Let's think We have a learning course, neither an advertisement nor spot with a subliminal message

- if We use the main message at the beginning and at the end of the resource We will get more memory
- We must think of emission and reception formats, and of supporting mean and te channel. If the type user goes to a speed of 28kbps and works with a 800x600 pixels screen resolution, although We design for 56kbps and 1024x768, We don't make the user restrictions to get better

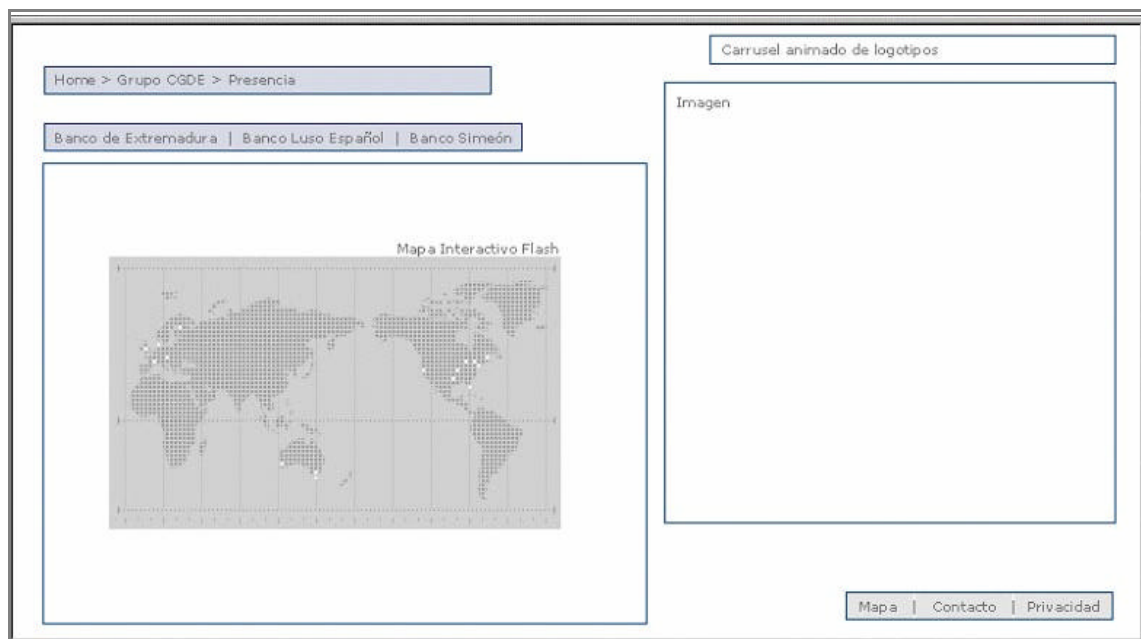


Figure 3. A kind of story board for a bank training course

c) Layout

We have all ready, script, resources, block diagram... Now, We have to layout the course and deliver it for a production step. In this step, as We know, an interactive program will be done for management and running

We have to give:

- chart made in SubStep 1
- all the writings in SubStep 2 and their links with resources
- all the resources in SubStep 3
- a story board with all put inside

One thing. Before delivering all to next step, please, Let's review it. But not just

oneself. We can give our work to somebody reliable. If We can choose, We will select two, one who knows about the theme, the contents and/or the didactics used in the course, and another one with less knowledge. Sure They will give a lot of very useful suggestions about all and find several details We could not do because We are too deep inside our own job. They sure can give us a little bit of time and They are very glad to participate in something as exciting as building a training course

CONCLUSIONS AND DISCUSSION

We show how, following an structured working methodology, We can build didactic units, in this case, for elearning.

Internet is a very fresh mean for training. If in any case Internet running is not over ten years ago, the use of it for teaching is not over five years. And, as a coming up technology, with its habits, needs fixing and evolution. In this paper We show a creating methodology for working cells, and We will have to fix at the same time technology and its use grew up in parallel and let us do it. Adding new resources and points of view into an online training system will allow a better scope and a better match between previous learning goals and real got ones. And this must be our final target, a margin zero between this both educational process stages

BIBLIOGRAPHY

- BOU BOUZÁ, Guillem. 'El guión multimedia'. (Multimedia scripting). Ed. Anaya. Madrid [2003]
- BURGOS, Daniel. 'elearning. Metodología del Aprendizaje Interactivo'. (elearning. Methodology for interactive learning). Ed. Prentice Hall. Madrid [2003]
- BURGOS, Daniel y DE-LEÓN, Luz. 'Comercio Electrónico, Publicidad y Marketing en Internet'. (Ecommerce, advertising and marketing in Internet). Ed. McGraw-Hill. Madrid [2001]
- BURGOS, Daniel y DE-LEÓN, Luz. 'Director 8.x/Lingo Práctico. Guía de Aprendizaje'. (Director 8.x/Lingo Practice. Guide of learning). Ed. McGraw-Hill. Madrid [2000]
- BURGOS, Daniel. 'Formación a Distancia Multimedia'. (Multimedia Distance Teaching). Ed. ESAC. Madrid [2003]
- BURGOS, Daniel y REYERO, Marta. 'Modelos de Aprendizaje'. (Learning models). Ed. ESAC. Madrid [2002]
- BURGOS, Daniel. 'Creación de Materiales Didácticos con Dreamweaver'. (Building Didactic Materials with Dreamweaver). Ed. ESAC. Madrid [2000]
- BURGOS, Daniel. 'Creación de un Guión Multimedia'. (Building a multimedia script). Ed. ESAC. Madrid [2000]

WEB REFERENCES

- BURGOS, Daniel. 'Inconvenientes y ventajas del e-learning'. (Problems and advantages about e-learning). Revista Educaweb, sección Monográfico, nº 0. www.educaweb.com. Madrid [2002]
- BURGOS, Daniel. 'Seguimiento y motivación de alumnos'. (Tracking and motivation of students). Revista Contraste Magazine, sección Formadores, nº 2. www.contrastemgn.net. Madrid [2000]
- ESAC, www.campusesac.org
- Contraste Magazine, www.contrastemgn.net
- Mediometro, www.mediometro.com
- Universidad Carlos III de Madrid, www.uc3m.es
- Universidad Europea de Madrid, www.uem.es

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