

Teaching creativity in engineering

TECRINO

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Technical requirements for the content definition

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1. Educational model definition

- **Elements**

SCORM content, allows students to visualize the learning content in an interactive browsing them.

The elements which together assist in the learning process are: Activities, Resources and Blocks.

- An **Activity** in Moodle is a feature where students learn by interacting with each other or with their teacher. They might for instance contribute in a forum, upload an assignment, answer questions in a quiz or collaborate together on a wiki.
- A **Resource** in Moodle is an item that a teacher can add to a Moodle course to support learning, such as a file, a video or link to a website. A resource differs from an activity in that it is static; i.e., the student can merely look at or read it, rather than participate.
- A **Block** in Moodle is an item that a teacher can add to the left or right of a Moodle course page. They provide extra information or links to aid learning. Blocks are a bit like "widgets" elsewhere online and can contain; for example, RSS news feeds, quiz results, a calendar, links to blogs, glossary terms or private files.

- **Methodology**

For an adequate development of the course, an open and flexible methodology is going to be followed, setting as the starting point the student's previous knowledge.

The students' participation will be essential; and it will be continuously evaluated by the course tutor at the same time.

The course will have tutors' team whose main function will be following and evaluating the pupils and to solve the doubts presented regarding the course thematic.

Therefore, a methodology based on the students and teachers' participation and collaboration proves to be, taking part in an unified way, causing a bidirectional reality in the teaching-learning process.

The evaluating process will be constantly, evaluating the conceptual and procedural advances of each student in each training material, in terms of the objectives attainment and the realization of several activities.

This course will be splitted into modules or blocks of content developed for a determined number of school hours.

A series of communicative tools will be used through the whole training process, which would be either synchronous or asynchronous tools that will promote the tutor-student interaction and between the whole students group itself. These will allow the students guidance.

Then, these tools will be described:

- **Chat module (synchronous communicative tool)**

The chat activity module allows participants to have a real-time synchronous discussion in a Moodle course.

A pedagogical level the chat can be used for discussion meetings, or monitoring of group work and also in brainstorming sessions (brainstorming).

This is a useful way to get a different understanding of each other and the topic being discussed the mode of using a chat room is quite different from the asynchronous forums. The Chat module contains a number of features for managing and reviewing chat discussions.

- **Forum module (asynchronous communicative tool)**

The forum module is an activity where students and teachers can exchange ideas by posting comments. There are four basic forum types. Forum posts can be graded by the teacher or other students.

The forum is one of the most used tools in the courses. The forums can have different functionalities:

1. **Course management.** The forums allow the open public information exchange about the management and administration of the course between students and teachers. In that sense, Moodle has a default forum called 'News' which is used as announcements board where the teacher can post several information related to the course.
2. **Learning.** Through the forums the students can think about the readings, debating on a topic by arguing their positions, etc.

3. The forums is a good resource for the **debate** given, considering that the contributions exposed on it are more elaborated than the other ones exposed in a chat (synchronic). This is the fact that the asynchronous forum character provides more time to think about before the participation on the forum. As a result, more elaborated messages either in form or content are included.
4. **Students support.** It can be used to solve the student doubts by the tutors so these aims will be accessible by the rest of the students. However, it is more interesting that their own classmates can solve the students' doubts, making easier the creation of a cooperating and helping environment between the course participants.

A forum can contribute significantly to successful communication and community building in an online environment. You can use forums for many innovative purposes in educational settings, but teaching forums and student forums are arguably the two more significant distinctions.

- **Instant messenger (synchronic communicative tool)**

Instant messenger allows us to send short messages to one or several course participants. It can be used either by teachers or students; however this last participant can only send messages to one person not to several at the same time. Messages are a short, efficient and habitual communicative channel that is used to accomplish a concrete notification or to give an answer to a specific issue. The efficiency and the speed of this messenger system is determined by how it works since when an user connects to his Moodle course, all the new received messages are shown automatically.

- **Glossary (asynchronous communicative tool)**

The glossary activity module allows participants to create and maintain a list of definitions, like a dictionary.

Glossary can be used in many ways. The entries can be searched or browsed in different formats. A glossary can be a collaborative activity or be restricted to entries made by the teacher. Entries can be put in categories. The auto-linking feature will highlight any word in the course which is located in the glossary.

- **Wiki (synchronic communicative tool)**

A wiki is a collection of collaboratively authored web documents. Basically, a wiki page is a web page everyone in your class can create together, right in the browser, without needing to know

HTML. A wiki starts with one front page. Each author can add other pages to the wiki by simply creating a link to a page that doesn't exist yet.

2. LMS (Learning Management System)

LMS (Learning Management System) selection Moodle, the Modular Object-Oriented Dynamic Learning Environment, is the world's most used learning management system. It presents several advantages that we think they make Moodle the perfect fit for our needs.

First of all it's open source, so it can be modified and adapted to our requests if this was necessary. On the other hand being a popular open source project gives you a guarantee of its security and integrity (after all, it has thousands of eyes over it).

Its popularity also means a huge troubleshooting database. If a problem arises there's a huge chance someone had it before we did and that the solution is already available.

There's also a big database for plugins, allowing us to extend the platform for new features without having to develop it or modify the source code.

Its requirements are, essentially, a webserver that supports PHP and a database that could be just MySQL, so it's highly portable from a machine to another and the costs to maintain it aren't too high.

And last but not least, it supports a wide variety of standards for course development, like SCORM 1.2, SCORM 2004, IMS or its own format.

3. Definition of metadata content description according to Accessible instructional materials (AIM) Standards.

For content definition and encapsulation we've chosen the Shareable Content Object Reference Model, SCORM 1.2. It's a widely used (almost de facto) standard for e-learning content.

Though it's not perfect, it presents an interesting set of advantages that are key for our project.

First of all, it's a "create once, publish everywhere" philosophy, meaning that once you export the content is exported to SCORM 1.2 format it can be uploaded to Moodle and be played immediately, but It can also be uploaded to any other e-learning platform that supports SCORM or create a multimedia CD to distribute.

There's also the long-time compatibility: no matter how old or new is the platform the course is going to be published on, as long as it supports the standard the course will be playable. A course made with SCORM 1.2 will play in a five year old Moodle installation and will play in a Moodle platform made ten years from now.

The content can be defined with a wide variety of authoring tools. For our case we will recommend using **eXeLearning**, a free and open source tool for easy course content design.



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