

# Moodle at FEUP

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## 1 Moodle evolution in FEUP

We started using *Moodle* at FEUP in January 2003 in a personal computer. Other teachers requested some space in that server, and in September of 2004 the service was transferred to a dedicated server maintained by the administration of the School.

The screenshot shows the Moodle@FEUP website interface at three different stages of its development:

- January 2003:** 1 course, 117 users. The logo features the word "moodle" in orange and "FEUP moodle" in purple.
- 2003/2004:** 14 courses, 1470 users. The interface includes a search bar and a menu.
- 2004/2005:** 53 courses, 2400 users. The interface is more complex, with a "Bem-vindo ao Moodle@FEUP!" message and a list of links for "ano lectivo 2003/04", "ano lectivo 2004/05", "edulivre", and "Estatísticas de acesso".
- December 2005:** 33 courses, 3000 users. The interface features a "moodle @FEUP" logo and a "Página principal" link.

The website also includes a sidebar with "Menu principal" and "Procurar" options, and a footer with "Este sítio serve de apoio a algumas das disciplinas leccionadas na Faculdade de Engenharia da Universidade do Porto (FEUP) e os docentes que queiram criar uma disciplina online,".

Currently, December 2005, 33 courses are hosted in the Moodle@FEUP server, and that number is expected to double when the second semester of the academic year 2005/2006 starts.

## 2 Courses with Moodle support

Moodle has been very useful in all the courses I have taught during the last year:

Course name	Engineering field	Enrolment
Physics	Civil	339
Electromagnetism	Informatics and Computing	256
Project MAFIQUI	all 9 majors in the School	841
Physics of Dynamical Systems	Informatics and Computing	120

The modules I have used the most are:

- Forums.
- Assignments.
- Quizzes (with a custom-made Latex format).
- Exams (custom-made module).

## 3 Quizzes

The quizzes we have created are all of the multiple-choice type, with many mathematical equations and graphs.

On-line quizzes are used for student's self-assessment, while the quizzes that are evaluated are administered off-line, in written form.

### 3.1 Latex source format for quizzes

To produce written quizzes with good printing quality, we have used the Latex system, with a custom-made format that can then be transformed into a Moodle-native format (GIFT) with a PHP script that we have created.

As an example, the following Latex code has been used for a question on a mathematics quiz:

```
%%Matemática 12, 2005-11-10
\item Seja  $g$  a função real de variável real cujo gráfico se mostra na
figura; designe-se por  $L_1 = \lim_{x \rightarrow +\infty} g(x)$ ,
```

```

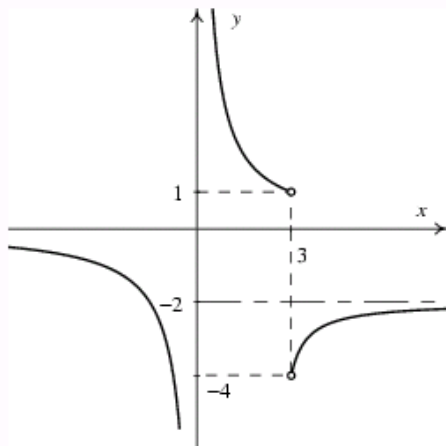
\displaystyle L_2 = \lim_{x \rightarrow 3^-} g(x),
\displaystyle L_3 = \lim_{x \rightarrow 0^+} g(x) e
\displaystyle L_4 = \lim_{x \rightarrow -\infty} g(x) .
\begin{center}
\includegraphics[scale=0.7]{fig-JTB11}
\end{center}
Das seguintes afirmações identifique a correcta:
\begin{answers}
\item $L_1 = -2$ , $L_2 = 1$ , $L_3 = -\infty$ , $L_4 = -\infty$
\item $L_1 = -2$ , $L_2 = 1$ , $L_3 = +\infty$ , $L_4 = 0$
\item $L_1 = +\infty$ , $L_2 = 1$ , $L_3 = +\infty$ , $L_4 = 0$
\item $L_1 = -2$ , $L_2 = -4$ , $L_3 = -\infty$ , $L_4 = 0$
\end{answers}
%%Resposta: B

```

That Latex code was then converted into GIFT format and imported into Moodle, giving the following result:

15. (1 valor. Máx 1)

Seja  $g$  a função real de variável real cujo gráfico se mostra na figura; designe-se por  $L_1 = \lim_{x \rightarrow +\infty} g(x)$ ,  $L_2 = \lim_{x \rightarrow 3} g(x)$ ,  $L_3 = \lim_{x \rightarrow 0^+} g(x)$  e  $L_4 = \lim_{x \rightarrow -\infty} g(x)$ .



Das seguintes afirmações identifique a correcta:

- A**  $L_1 = -2$  ,  $L_2 = 1$  ,  $L_3 = -\infty$  ,  $L_4 = -\infty$
- >> B**  $L_1 = -2$  ,  $L_2 = 1$  ,  $L_3 = +\infty$  ,  $L_4 = 0$
- C**  $L_1 = +\infty$  ,  $L_2 = 1$  ,  $L_3 = +\infty$  ,  $L_4 = 0$
- D**  $L_1 = -2$  ,  $L_2 = -4$  ,  $L_3 = -\infty$  ,  $L_4 = 0$

### 3.2 Postscript format for figures

All images used in our quizzes are generated from source code files in the PostScript language, invoking a collection of PostScript functions that we have written (**psimage**). For example, the source code for the graph in the figure above is the following:

```
0.6 setlinewidth setaxes
-6 -6 8 6 domain (@x) xlabel ( @y) ylabel
( 3) 3 xmark (1) 1 ymark (-2) -2 ymark
/yflag true def () -4 ymark 0 -6 rmoveto (-4) show
1 setlinewidth
% function 3/x in [-6, -0.5]
[-6 0.05 -0.5 {dup 3 exch div} for] plot
% function 3/x in [0.5, 3]
[0.5 0.05 3 {dup 3 exch div} for] plot
% function -2 - 1/(x-2.5) in [3, 8]
[3 0.05 8 {dup 2.5 sub -1 exch div 2 sub} for] plot
0.5 setlinewidth [0 1 3 1 3 -4 0 -4] 1 dashplot
[0 -2 8 -2] 2 dashplot
0.8 setlinewidth 3 1 openpoint 3 -4 openpoint
showpage
```

### 3.3 Written versions of the quizzes

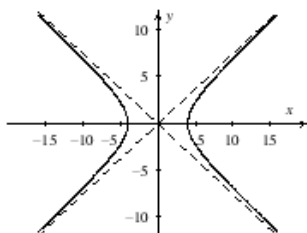
The Latex and PostScript formats used for the questions, lead to very good quality printed versions of the quizzes, as shown in the following figure.

NOME: \_\_\_\_\_ CÓDIGO: \_\_\_\_\_

**DURAÇÃO:** duas horas.**COTAÇÃO:** respostas correctas, 1 ponto, erradas,  $-1/3$ , em branco ou anuladas, 0 pontos.

Cada pergunta tem uma única resposta correcta, se assinalar mais do que uma resposta, a resposta será anulada. Se se enganar e quiser corrigir, pode preencher todos os quadrados nessa pergunta e desenhar um círculo à volta da letra da resposta pretendida.

1. Qual das seguintes equações pode representar a cónica esboçada na figura?



- A   $\frac{x^2}{81} - \frac{y^2}{16} = 1$   
 B   $\frac{x^2}{16} - \frac{y^2}{9} = 1$   
 C   $(x-2)^2 - (y-2)^2 = 1$   
 D   $\frac{y^2}{16} - \frac{x^2}{9} = 1$

- A   $L_1 = -2, L_2 = 1, L_3 = -\infty, L_4 = -\infty$   
 B   $L_1 = -2, L_2 = 1, L_3 = +\infty, L_4 = 0$   
 C   $L_1 = -2, L_2 = -4, L_3 = -\infty, L_4 = 0$   
 D   $L_1 = +\infty, L_2 = 1, L_3 = +\infty, L_4 = 0$

4. Sabendo que  $x \in \left] \pi, \frac{3\pi}{2} \right[$  e que  $\cos x = k$ , o valor de  $\sin x$  é:

- A   $-\sqrt{1-k^2}$       C   $\sqrt{1+k^2}$   
 B   $\sqrt{1-k^2}$       D   $-\sqrt{k^2+1}$

5. Considere o conjunto

$$U = \left\{ x \in \mathbb{R} \setminus \{-2\} : \frac{x^2 - 2x + 4}{x + 2} \geq 1 \right\}$$

Das seguintes respostas escolha a correcta:

- A   $U = ]-2, 1] \cup [2, +\infty[$

## 4 Exams module

As we mentioned earlier, the source code of the quizzes is also transformed into GIFT format and imported into Moodle.

We have created a Moodle module, the **exam** module, that helps teachers transfer the student's answers from the written quizzes into Moodle. Grades are then computed automatically and students can see their exams and grades through Moodle's web interface.

Students can thus study their exams carefully, at any time and from any place with web access, without having to set up an appointment with their teachers.

Teachers are shown a grading sheet (see figure below) with links that can be used to see the exam of an individual student or to obtain statistics for the whole group.

FEUP moodle

FEUPmoodle » EC2108 » Avaliações » Micro-teste 1

Actualize este(a) Avaliação


### Micro-teste 1


Micro-teste 1: 242 alunos já foram avaliados. Média = 9

	Código	Nome completo	Nota	Data	Ponto	Ações
	030501050	Adriano Filipe Oliveira	13	2005-03-11	8C	
	020501043	Adriano Filipe Ferreira Rodrigues				
	030501051	Albano Manuel Silva Ferraz	15	2005-03-30	14B	
	010501141	Alberto César da Silva	3	2005-03-07	2C	
	030501052	Alicia Azevedo Meireles	10	2005-06-07	11A	
	030501053	Aline Floret Matias Aline Floret Matias	8	2005-03-15	11B	
	000501249	Alvarim Fernando Oliveira de Almeida				
	010501019	Ana Claudia Costa Pereira				


## 5 Automatic evaluation of Scheme Programs

We have also created a Moodle block, called **grade\_programs** that the teachers of introductory programming have used to grade student's programs automatically:

 Marc Olivier Esteves Goncalves Última alteração: Terça, 11 Janeiro 2005, 13:02 (2 minutos 29 segundos atrasado)

 [ei04048.scm](#)

Resolução:

 **Classificação:** 12 (Segunda, 31 Janeiro 2005, 16:49)  
**Comentários:**

NOTA: esta avaliação foi feita em forma automática.  
A nota apresentada ainda não é definitiva.

INPUT 1:  
(sector -1 2)  
Output esperado:  
-----  
3  
Output obtido:  
-----  
3  
Correcto (1 valor)

INPUT 2:  
(sector -1 -2)

Students are asked to write a specific program, during an on-line session with Moodle. They have to submit their programs using an assignment activity in Moodle.

After the on-line session, the **grade\_programs** block allows teachers to submit their own program, together with some tests. Each test will be run using the students programs, and the results compared to those obtained using the teacher's program; a grade will be assigned automatically, according to the number of successful tests.

That system has been used at FEUP to teach Scheme programming to first-year engineering students, during the last two years.

## 6 Project Edukalibre

**Edukalibre** is a European research project (Socrates/Minerva program) dedicated to the production of free (as in freedom) educational software and documents.

The project consortium is composed by 6 partners:

1. University Rey Juan Carlos, Madrid, Spain.
2. University of Leeds, England.
3. University of Karlsruhe, Germany.
4. UTIA, Prague, Check Republic.
5. University of the Italian-speaking Switzerland, Lugano, Switzerland.
6. FEUP, University of Porto, Portugal.

Our group at FEUP includes one professor, one post-doc, one masters student and four undergraduate students.

### 6.1 Edukalibre software

The Edukalibre project, which is ending by the end of this month, has produced the following software packages:

**Glue** Format conversion tools among OpenOffice, Docbook, HTML, Latex and PDF.

**Collab** Moodle module for collaborative creation of educational documents, with version control. It can also be used independently from Moodle.

**Condor** Groupware system for Moodle.

**Gismo** A Graphical Interactive Student Monitoring System for Moodle.

**WikiEduka** A wiki tool for Moodle, with conversion to Docbook format.

The following screenshot shows the interfaces for Collab, Condor, Gismo and the WikiEduka editor.

**EdukaLibre**  
[All the documents](#) | [Summarized List](#) | [Edukalibre Site](#) | [Gforge Site](#) | [RSS](#)

Doc's name: **new\_document\_for\_testing** (This is the last version)  
 Uploaded by: guest  
 Release Name: Second version  
 Revision: 1037  
 Last Modification : Sun Nov 6 21:50:02 2005  
 Document's Page

Source file type: **Docbook**

<b>Title</b>	New document titleThis document belongs to the edukalibre project.																
<b>Author</b>	Chaparro, Diego dchaparro@gsyc.escet.urjc.es																
<b>Abstract</b>	No abstract available																
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**Condor development**  
 CONDOR » CF 101 » Groupware » groupware test

[Home](#) | [Messages](#) | [Discussions](#) | [Resources](#) | [Help](#)

Welcome Guest User

**Welcome to the condor groupware tools**

This tool has five sections.

- **Home** For seeing who is online for chatting.
- **Messages** for one-to-one messages to other people in your group.
- **Discussions** for public discussions with people in your group.
- **Resources** for sharing files, and working on collaborative

**People Online now.**

You may open a group chat by clicking on any of the names **see below.**  
 (This does not inform the other people wish to chat.)

[User](#) [Last seen](#)

**Students Discussion Overview**

Scatter plot showing Post Count (red squares), Read Count (blue squares), and Thread Started (green triangles) for various students. The x-axis is 'Count' (0-70) and the y-axis is 'Students' (026-071).

Math Editor:  $\frac{dy}{dx} = \sqrt[3]{\beta x^3 - 2y}$

## 7 Conclusions

We have a strong commitment to Moodle in FEUP and we are developing new functionalities for it. We are also developing course materials that can be reused in other Schools.

## References

[1] Moodle@FEUP. <http://moodle.fe.up.pt>

[2] Project Edukalibre. <http://www.edukalibre.org>

[3] Edukalibre at Leeds University. <http://edukalibre.comp.leeds.ac.uk/>

[4] GISMO. <http://gismo.sourceforge.net/>

[5] exam: a module for Moodle. <http://quark.fe.up.pt/cgi-bin/viewcvs/moodle/mod/exam/>



- [6] grade\_programs: a block for Moodle.  
[http://quark.fe.up.pt/cgi-bin/viewcvs/moodle/blocks/grade\\_programs/](http://quark.fe.up.pt/cgi-bin/viewcvs/moodle/blocks/grade_programs/)
- [7] Psimage. <http://quark.fe.up.pt/psimage/>