

#### **TECHNOLOGIECAMPUS OOSTENDE**



#### Implementation of Innovative ICT Based Teaching & Learning Methods (related to WP3)

#### Erasmus+ Project "PHYSICS"



Renaat De Craemer, Joan Peuteman, Anik Janssens

- Teaching and preparing students:
  - o to think and act as an academically skilled person,
  - o to realise an academic and research oriented career,
  - to realise an industry oriented career.

This main goal requires an appropriate **learning process** embedded in a **learning environment**.

• The Learning Environment can be modelled as:





- The **learning objectives** for each course need to be formulated:
  - o knowledge, attitudes, skills, ...
- The student characteristics are important:
   prior knowledge, motivation, interests, age, ...
- The student needs to be evaluated (assessment):
   o formative and summative assessment
  - when, what, how, who, ...

- The learning process and the content of the course is also very important:
  - **Digital content** is easy to adjust and elaborate
  - **Digital content** is easy to structure
  - **Digital content** provides new possibilities
  - A Virtual Learning Environment is an important tool.



- A Virtual Learning Environment allows teachers to:
  - provide students with study material of different types (for example e-books)
  - interact with the students in real-time
  - o follow the evolution of the learning process
  - know the performance of each student in specific tasks



- A Virtual Learning Environment is known to be useful when teaching 'science' and 'physics'.
- Objects of many kinds can be used:
  - Text documents
  - Videos and mp3
  - Scanned images
  - Links to websites
  - o Animations
  - Simulations



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- A Virtual Learning Environment provides **useful tools**:
  - uploading of course material i.e. course content
  - Questionnaires + quizzes
  - (peer)assessment
  - Communication, including chat sessions and forums
  - Wikis and blogs
  - Tracking tools
  - Feedback to the students
  - Administration of student groups



- Virtual Learning Environments can be:
  - o Commercial software: e.g. Toledo, Blackboard
  - Open source software: e.g. Moodle







- In a Toledo community, a draft of the online course "applied physics" has been made.
- See: <u>https://toledo.kuleuven.be/</u>
- The course is organized in separate blocks:
  - Announcements
  - Information: general and administrative information
  - Contacts
  - Documents: contains several chapters
  - Tools



• A screenshot of the block "documents"

Applied Physic	S
> Documents	
+ E Applied Physics Announcements Information Contacts Documents Tools	Documents ? Toledopedia
Control Panel     Content Collection →     Organization Tools	Chapter 2: Conducted emission measurements
<ul> <li>▶ Evaluation →</li> <li>▶ Grade Center →</li> <li>▶ Users and Groups</li> <li>▶ Customization →</li> </ul>	Chapter 3: The use of a Faraday cage
<ul> <li>▶ Packages and Utilities →</li> <li>Help [Toledopedia]</li> </ul>	



- Each chapter contains a number of items. For example in 'chapter 1', we have embedded a number of items:
  - Roadmap: the menu to be followed in a chronological order
  - Learning outcomes
  - Pre-requisites: to reveal any lack of prior knowledge
  - Theoretical lecture: e.g. 'introduction to EMC'
  - Open ended questions
  - Close ended questions
  - Learning tasks: to extend the level of the newly acquired knowledge

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• Screenshot of 'chapter 1'

Items 1-4 are standard and will be included in each chapter.

Items 5-7can vary chapter by chapter.

6	<ul> <li>Roadmap</li> <li>Enjoy "Applied Physics" and go for a full comprehension of the concepts outlined in chapter 1. Here is the menu to follow in a chronological order:</li> <li>take note of the learning outcomes before starting to study</li> <li>examine the pre-requisites to reveal any lack of foreknowledge</li> <li>read carefully and try to understand the theoretical lecture "Introduction on EMC"</li> <li>check your knowledge by answering the open-ended check questions</li> <li>evaluate yourself by performing the test with the closed-ended check questions</li> <li>carry out the learning tasks to extend the level of your knowledge</li> </ul>
	Learning outcomes
8	Pre-requisites
6	Theoretical lecture "Introduction to EMC" Attached Files: 🗋 Introduction to EMC 📀 (943.899 KB)
0	Check questions (open-ended)
	Check questions (close-ended) Availability: Item is not available.
E	Learning tasks

## The use of Moodle

- Instead of Toledo, also the open source software Moodle can be used.
  - Courses developed by Toledo or Moodle allow selfstudy of the student (coached by a teacher allowing distance learning).
  - Courses can be combined with classroom lessons, realising blended learning.



## The use of Moodle

- A Moodle account can be obtained using website <u>https://eduspace.lv/?lang=en</u> (eduspace)
- Using Toledo or Moodle, **all educational tools** mentioned before **can be demonstrated**.
  - Uploading content, using questionnaires, ...
  - peer assessment, sending personal messages, communication between teacher and student, ...
- Using Toledo or Moodle, the educational tools which are useful can be used by all of us.



### The use of Moodle

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	5 Yow, select the course yow want to participate in 6 if you are prompted for an "enrolment key" - use the one that your teacher has given you. This will "enrol" you is the course.
Log In	7. You can nove access the full course. Primming on you will only need to enter your personal usemanic and plassifiered on the term on this page) to say in and access any course you have enclosed an
E Remansker usernene	
Corpoliton your another or personnel?	Create new account

The eduspace login page.

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#### Image 3. Eduspace.lv course category page

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### **Practical approach**

 The Erasmus+ "Physics" team needs a practical approach to realise the courses on the Moodle environment.

#### **Suggestion:**

- Concerning the course "Applied physics", a practical example will be realised 'as fast as possible' (target: summer time or September 2016).
- **Inspired by this example** other courses can be realised using Moodle.



#### **Practical approach**

- When **realising other courses using Moodle**, the KU Leuven team will **try to help** you. The "workshop on ICT environment tools" in Belgium (April 2017) is important.
- Suggested principle:
  - Virtual Learning Environments like Moodle provide tools.
     You use the tools you need i.e. which are useful.



#### **Practical suggestions?**

Let's discuss the possibilities.



## References

- Martin-Blas T., Serrano-Fernandez A. (2009), <u>The role of new technologies in the learning process: Moodle as a teaching tool in physics</u>, Computers & Education, vol. 52, pp. 35-44.
- Dewulf L., Janssens A., (2010), <u>Actief in de digitale</u> <u>leeromgeving, Mechelen</u>, Uitgeverij Plantyn, ISBN 978-90-301-0386-8
- A lot of other papers discuss the possibilities provided by a learning platform like Moodle



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