

Implementation of Innovative ICT Based Teaching & Learning Methods (Related to WP 3).

Intention: compose e-books

- Industry's needs.
- Integrate innovative ICT enabled didactical approaches
- Learning Outcomes aim at (*developing student's*):
 - *Key Competences*
 - *Basic Skills*
 - *Language Skills*
- Reference could be : Dewulf, L., Janssens, A. (2010). *Actief in de digitale leeromgeving*, Mechelen, Uitgeverij Plantyn, ISBN 978-90-301-0386-8 .

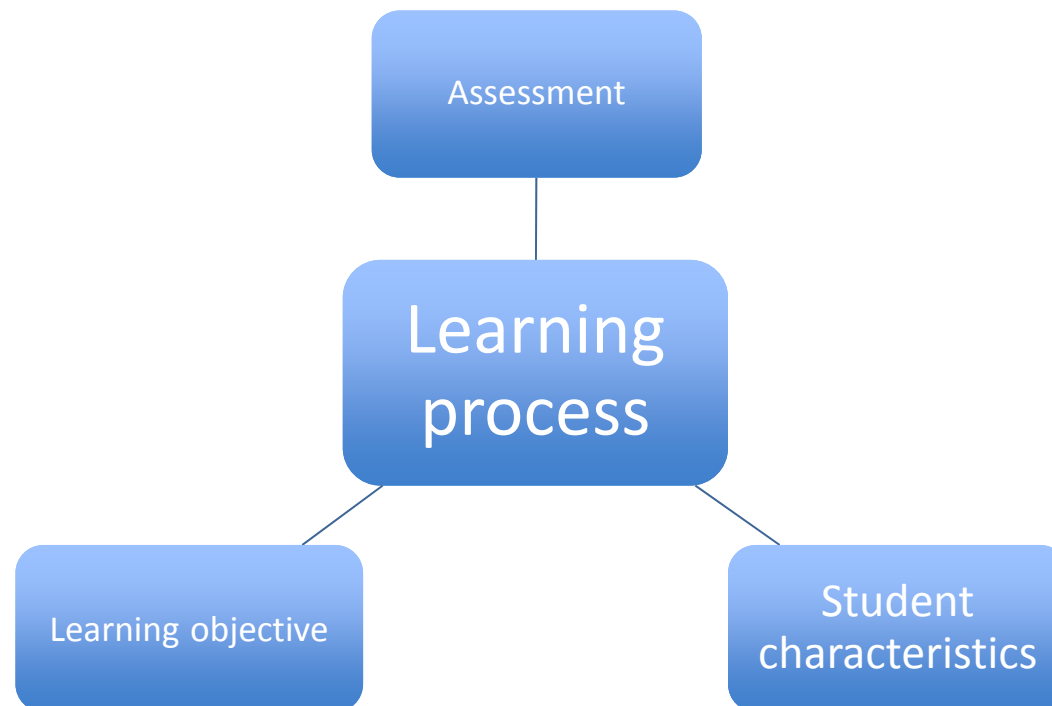
Implementation of Innovative ICT Based Teaching & Learning Methods (WP 3).

How to “*manage*” the implementation of ICT ?

- Based on the “*Learning Model*” as here under
- KU Leuven would/will develop a “*format*” for each course:
 - Allowing the partners to describe their implementation:
 - ✓ ...
 - ✓ ...
 - Allowing KU Leuven to manage:
 - ✓ ...
 - ✓ ...
 - ✓ ...

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→ Use a **Model** for the Learning Environment:



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Following the Model: *Learning Objectives*

- Clearly defined and written
- Related to the needs of the industry ...
 - ... knowledge + attitude + skills
- Lifelong learning
- ICT = a **means** to reach the Learning Outcomes

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Following the Model: *Student Characteristics*

Students are different

- Prior knowledge (& ... knowledge standards)
- Previous training(s)
- Motivation
- Interests
- Learning habits
- Age
- Skills using ICT (-technology)

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Following the Model: *Evaluation*

- Terminology: Assessment, Evaluation, Marking, Grading,...
... related to the learning activities
- Variety of assessments
- Need to be clear to the student:
 - When
 - What
 - How
 - Who
 - Feedback

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Following the Model: *Learning Process - Content*

Lecturer/professor defines the content

- Digital content is easy to adjust and elaborate
- Digital is easy to structure
- Digital can bring (must bring ...) added value:
 - Giving instructions to the student
 - Organising reading material, data, questions, assignments.
 - Material easily “copy-and-pasted” to other courses.

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Following the Model: *Learning Process - Activities*

Classes, virtual classes, e-learning, ... ICT can offer:

- Self-study
- Panel discussions (synchronous and a-synchronous)
- Assignments
- Experiments & Simulations
- Demonstrations (synchronous and a-synchronous)
- Project work, Team work
- Portfolio

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Following the Model: *Learning Process - Coaching*

E-learning is a demanding activity for the ... tutor/coach:

- Tutor needs to be “present” (virtual)
- Learning activities clearly defined
- Supporting students: directions, examples, feedback, follow-up of deadlines
- Be present during/at (panel) discussions
- Available/accessible for individual students
- Select and/or develop sound/image/video/interactivity.

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How to “*manage*” the implementation of ICT ?

- Based on the “*Learning Model*” as mentioned here above
- KU Leuven would/will develop a “*format*” for each course:
 - Allowing the partners to *describe* the implementation:
 - ✓ The Learning *Objectives*, the *Student Characteristics* and *Evaluation*
 - ✓ The script/scenario referring the *Content*, the *Activities* and the *Coaching* to the *Learning Process* and the *Learning Platform*.
 - Allowing KU Leuven to *manage* the implementation
 - ✓ If/how innovative IC Technology is applied
 - ✓ Asking for additional information and give feedback
 - ✓ Reporting to the “Physics- consortium”

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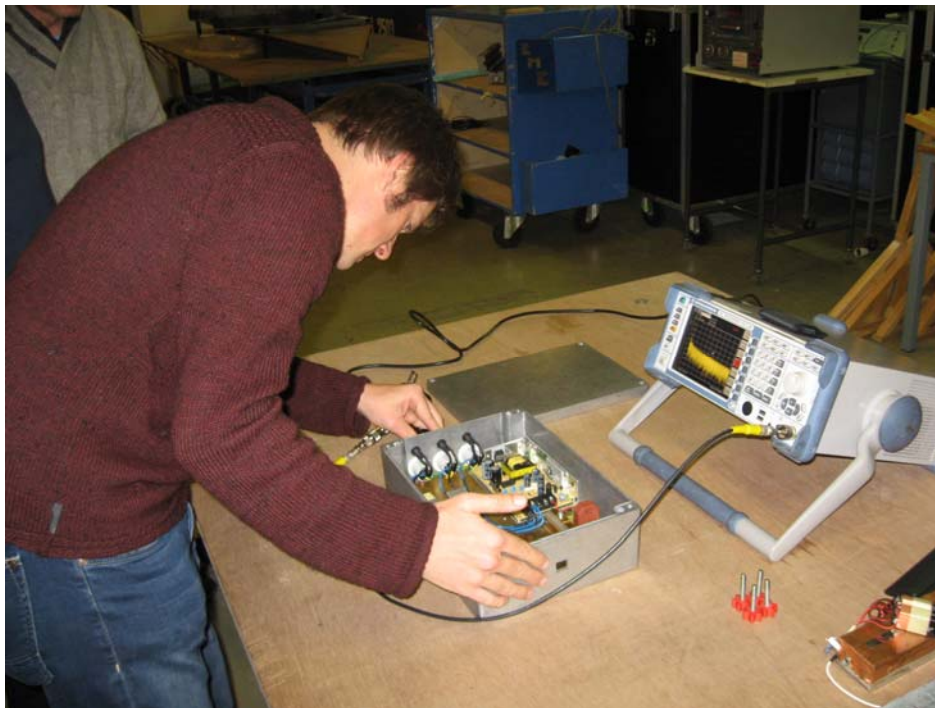
KU Leuven - *Physics: Electromagnetism and EMC-EMI*

As a first approach:

- Theoretical tutorials for self-study (part of E-book)
- Multimedia tutorial (power-point with audio)
- Questionnaires using a digital discussion forum
- Lab demo's (video and audio)
- Remote demo's of Lab measurements providing data
- Assignments based on remote lab measurements: including remote feedback
- Next step... : student exchange period in the lab abroad... ??

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KU Leuven - *Physics: Electromagnetism and EMC-EMI*



Implementation of Innovative ICT Based Teaching & Learning Methods (Related to WP 3).

KU Leuven - *Physics: automation, control theory, system theory*

As a first approach:

- Tutorial on differential and difference equations: self-study
questionnaire on the tutorial: digital discussion forum
- Simulation exercises using MATLAB & SIMULINK
 - team work
 - discussion forum
 - evaluation: peer-to-peer & by teacher/coach
- Application on electrical grid stability analysis
- Questionnaire on the tutorial, using a digital discussion forum
- Simulation exercises including feedback by teacher

An Engineers approach to 'qualify' learning effort:

If:

A=1, B=2, C=3, D=4, E=5, F=6, G=7, H=8, I=9, J=10, K=11, L=12,
M=13, N=14, O=15, P=16, Q=17, R=18, S=19, T=20, U=21, V=22,
W= 23, X =24, Y=25, Z=26.

Then:

Gathering '**Knowledge**'=11+14+15+23+12+5+4+7+5= **96%**

Putting in '**Hard Work**'=8+1+18+4+23+15+18+11=**98%**

Developing an '**Attitude**' = 1+20+20+9+20+21+4+5=**100%**