

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

Kick-off meeting on December 5-6th (2019).

Erasmus+: Development of practically-oriented student-centred education in the field of modelling of Cyber-Physical Systems (CybPhys)

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## **Basic goal**

ICT based tools

Virtual Learning Environments

Practical suggestions



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# Basic goal

Teaching and preparing students:

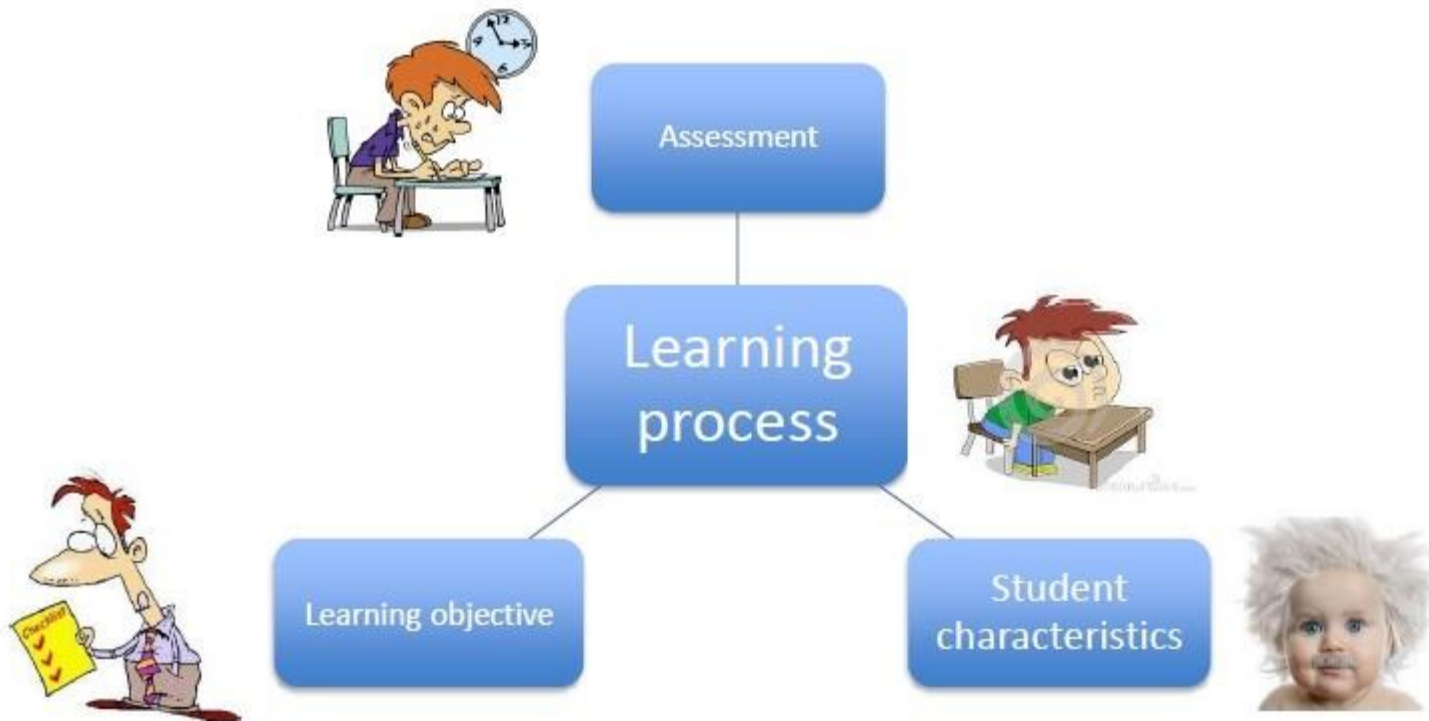
- to think and act as an academically skilled person,
- to realise an academic and research oriented career,
- to realise an industry oriented career.

A decent **learning process**, embedded in a learning environment, is needed to reach these basic goal(s).



# Basic goal

The **learning environment** is often modelled as:



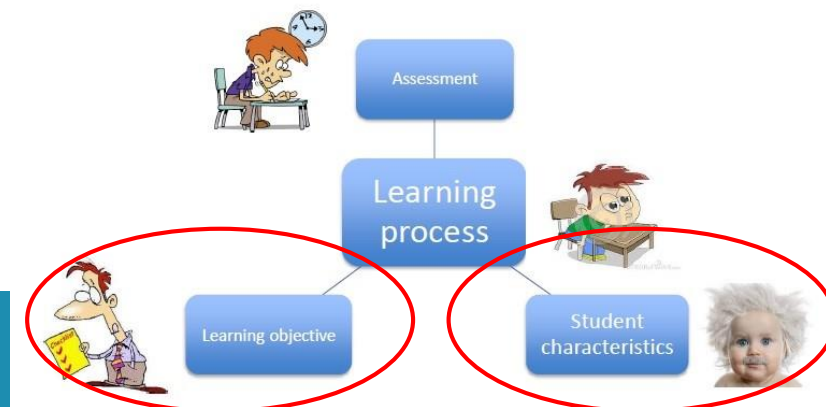
# Basic goal

The **learning goals** for each course need to be formulated:

- knowledge, attitudes, skills, ...
- adapted to the needs of the professional field (e.g. industry, academic institutions, ...).

The **student characteristics** are important:

- prior knowledge
- ICT skills
- motivation, interests, age, ...



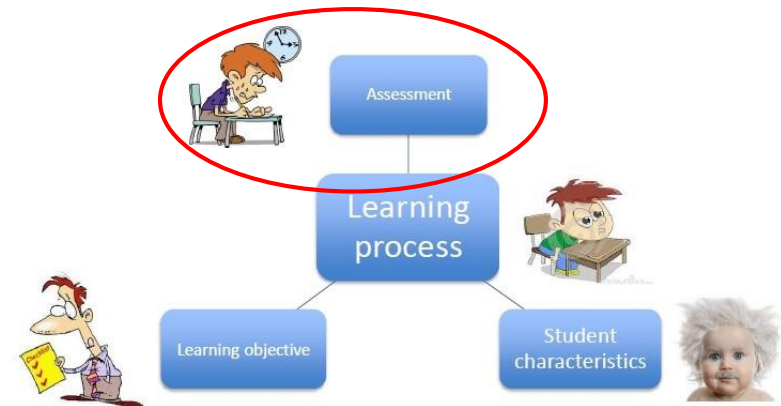
# Basic goal

The student must be **evaluated** (assessment)

- formative and summative assessment
- when, how, what, who, ...

After an evaluation, it is important to provide **feedback** to the student.

HOW TO GIVE STUDENTS  
SPECIFIC FEEDBACK  
THAT ACTUALLY  
HELPS THEM LEARN



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# ICT based tools

The learning process and the content of the course is very important.

**Paper based course materials** remain important. But

- **digital content** is easy to adapt to new circumstances,
- **digital content** is easy to structure,
- **digital content** provides new possibilities.

This is very important from the point of view of the teacher/professor.



# ICT based tools

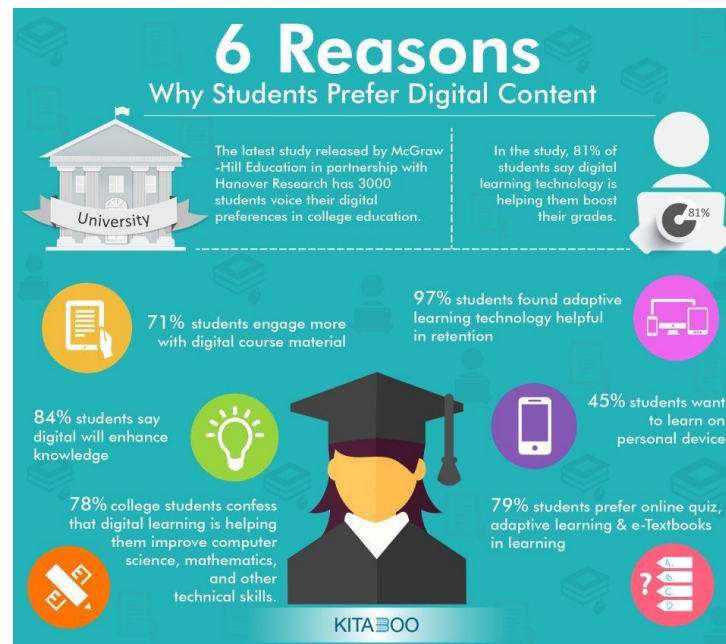
Digital content, ICT based tools are an important topic in the present Erasmus+ project CybPhys: **WP3**

- Creation of an **e-library**: we all together develop *e-books*
- Developing **learning and teaching methodologies** and pedagogical approaches based on the use of ICT
- Use of **virtual lab practices** in computer classes
- ...

A **Virtual Learning Environment** is also an important tool.

# ICT based tools

The use of digital learning materials and ICT based tools is often appreciated from **the point of view of the students:**



[\(https://elearninginfographics.com/students-prefer-digital-content-reasons-infographic/\)](https://elearninginfographics.com/students-prefer-digital-content-reasons-infographic/)

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# Virtual Learning Environments

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,
- follow the evolution of the learning process,
- know the performance of each student in specific tasks,
- ...

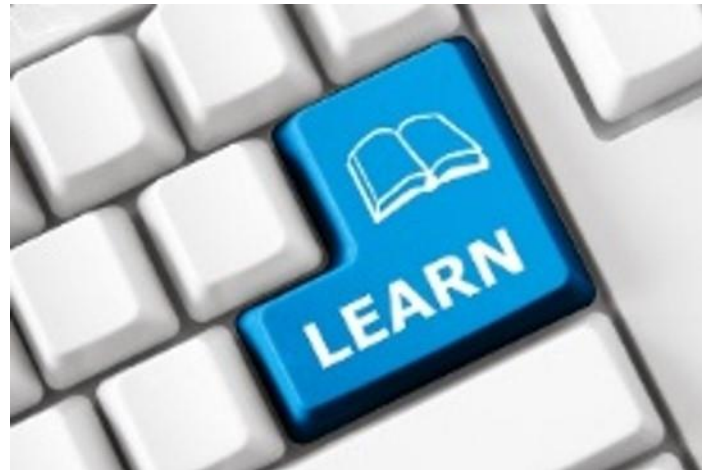


# Virtual Learning Environments

A **Virtual Learning Environment** is known to be especially useful when teaching 'science' and 'physics'.

Objects of many types of information can be used:

- Text documents
- Videos and mp3
- Scanned images
- Links to websites
- Animations
- Simulations
- ...



# Virtual Learning Environments

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
- providing feedback to the students
- administration of student groups
- ...

# Virtual Learning Environments

A **Virtual Learning Environment** stimulates

- lifelong learning
- distance learning
- virtual mobility
- practical implementation of learning and teaching methodologies and pedagogical approaches
- ....

# Virtual Learning Environments

Virtual Learning Environments can be:

- Commercial software (e.g. Toledo, Blackboard)
- **Open source software** (e.g. Moodle)

In the present Erasmus+ project CybPhys, the decision has been taken to use **Moodle**.





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# Practical suggestions

In combination with the **development of the e-book** on “cyber-physical systems for clean transportation”:

- The KU Leuven will show the possibilities of the use of a **Virtual Learning Environment** based on these course materials
    - This information is useful during our **meetings**.
    - This information is useful during the **workshops** which will be organised in Belgium.
- = development and use of “good practices”.

# Practical suggestions

Developping and using “**good practices**” with **Moodle**:

- Integrating **multimedia materials** (including technical reliability issues of cyber-physical systems in the transportation sector).

Developing “good practices” with a limited number of other ICT based tools (e.g. wikis, prezis, gitbook, ...).

# Practical suggestions

Practical suggestions from the group:

- ...
- ...
- ...
- ...

# Practical suggestions

Please, do remember:

- ICT based tools need to **help** teaching staff and students.
- ICT based tools can be **combined** with traditional approaches.
- Use the **appropriate** ICT based tools for your course.
- When ICT based tools have no added value: do not use them.

# References

Dewulf L., Janssens A., (2010), Actief in de digitale leeromgeving, Mechelen, Uitgeverij Plantyn, ISBN 978-90-301-0386-8.

Thank you for your attention!

Questions?



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