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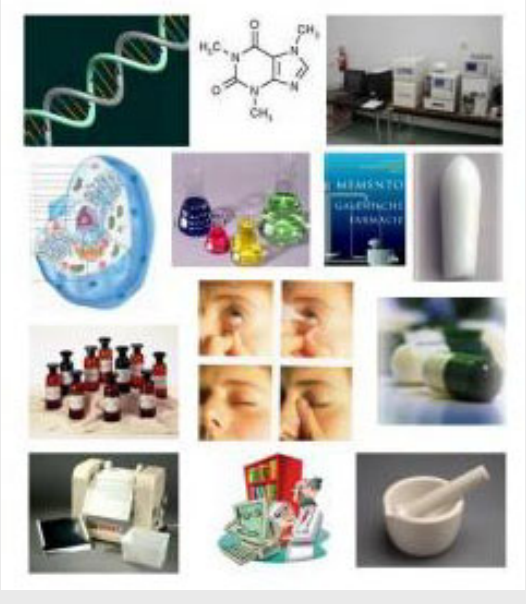
FACULTEIT FARMACEUTISCHE WETENSCHAPPEN

THE IMPACT OF COMPUTER SUPPORTED COLLABORATIVE LEARNING ON INTERNSHIP OUTCOMES OF PHARMACY STUDENTS



The Impact of Computer Supported Collaborative Learning on Internship Outcomes of Pharmacy Students
EUFEPS 2nd European Workshop on Computer-Aided Learning in Pharmaceutical Sciences, Wenen, November 2008
Sofie Timmers and Willy R.G. Baeyens
Ghent University - Faculty of Pharmaceutical Sciences

Introduction

Changing role of the pharmacist in the course of time

⇒ universities should pay more attention to:

- a critical approach of the patient-drug relationship
- collaborative skills
- an integrated approach to find a solution for several pharmaceutical problems
- a critical approach of the information spread on the internet
- a positive attitude towards lifelong learning

Ghent University ➔ development of a new educational technique to support an integrated approach = Computer Supported Collaborative Learning Environment (CSCLE)

Introduction

The present study → impact of the CSCLE on the internship outcomes

↓

at random picked from the various outcomes:
- being able to communicate in a multidisciplinary environment
- being able to provide patients with critical information about diverse drugs and medicines
- being able to understand the structure of the social security system and the health insurance reglementation
- knowing the Belgian pharmaceutical legislation
- having a profound knowledge of pharmacotherapy and rational use of medicines and being able to explain this to the patients
- …

⇐ Integrated vision on patients/medicines = unavoidable

The curriculum reform

Students should develop the necessary competences (in pharmaceutical care)

⇒ integrate the acquired knowledge base in view of analysing various pharmaceutical problems and patient cases

⇒ combine conditional knowledge and skills in view of coping with clinical situations

➔ an evidence based approach
a competence based orientation of the curriculum } have been adopted

Development of "*Integrated Pharmaceutical Knowledge*" = a course instructed in the last year of the curriculum (as a part of the internship)

Integrated Pharmaceutical Knowledge – set up

Real (patient) cases:

- are being selected by the students themselves during their internship
  (= real, actual situations; these are being put in a database)
  ➔ individual analysis

- are presented to the students
  ➔ the students have to analyse them in group (synchronously or asynchronously)
  ⇒ developing communicative and collaborative skills

Implementation in Minerva (= e-learning environment of the Ghent University)

➔ Homepage Minerva

➔ Homepage Internship and Integrated Pharmaceutical Knowledge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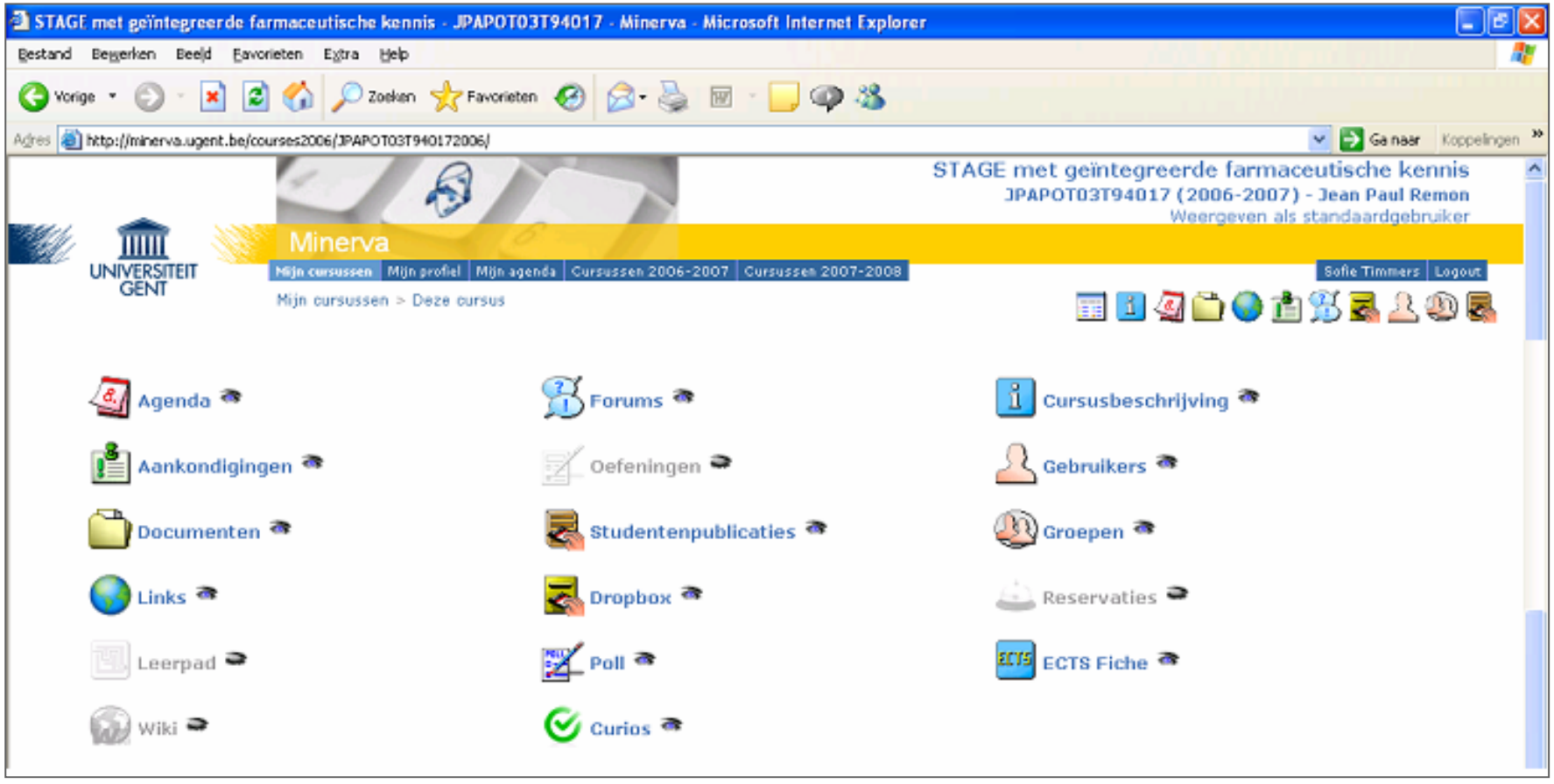
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Integrated Pharmaceutical Knowledge – academic yearplan

1st semester

synchronous case-analysis (in groups of six students)
- get used to work with patient cases and with integrated thinking

~~on-line~~

2nd semester

asynchronous case analysis (in groups of six students)
- acquire better skills for integrated analysing of a patient case

on-line

individual case analysis
- select a patient case to analyse during the 26 weeks of internship

individual exam
- evaluation of the integrated knowledge acquired by the students

electronic

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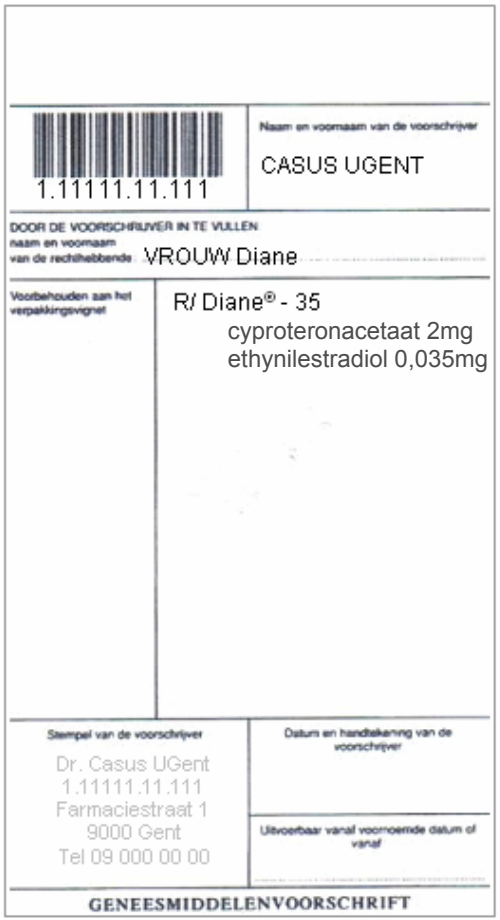
Integrated Pharmaceutical Knowledge – asynchronous case-analysis

➔ on-line fora (Minerva)

- *time and place independent*
- *a possibility to provide permanent feedback from the university*

➔ a patient case

- *a person or a family → 6 visits to the community pharmacy*
  - *~ full description of every visit*
  - *~ related medical prescriptions are shown*
- *20 à 25 questions*
  - *~ projection of as many subjects as possible*
    - *⇒ integrated analysis*
  - *~ new relevant information that students have to look for (e.g. on the internet)*
    - *⇒ lifelong learning*
- *every year new patient cases*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Naam en voornaam van de voorschrijver
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Tel 09 000 00 00

Datum en handtekening van de voorschrijver

Uitvoerbaar vanaf voornoemde datum of vanaf

GENEESMIDDELENVOORSCHRIFT

Patient case

In this case a *woman* (20 years), Body Mass Index = 27, who suffers from hirsutism, comes into the community pharmacy with this prescription.
She doesn't take other medicines. She doesn't smoke or abuses alcohol. She doesn't know her bloodtype.
She tells the pharmacist that this is the first time that she will use this medicine.

Questions:

- What will be the advice to be given to this patient concerning the posology?
- What will be the advice to be given to the patient in case of vomiting or diarrhoea?
- What do you think about the choice of contraceptive for this patient?

Integrated Pharmaceutical Knowledge – asynchronous case-analysis

➔ Patient case + questions (25 questions/case)

-are sent electronically to the students

~ via e-learning environment Minerva

~ opportunity to present real-life problems

- electronic discussion between the students of one group

- every case is accessible for the students during 2 weeks

~ after two weeks a new case is presented (the "old" case is not longer accessible)

⇒ ***after two weeks: students are to provide a common conclusion for every answer to every question***

Integrated Pharmaceutical Knowledge – CSCLE – The Study

As mentioned before:

- a CSCLE implies that students have to collaborate *on-line* with other students to discuss and solve the pharmaceutical problems presented in the cases
- on-line collaboration fosters knowledge acquisition and competence development due to the explicitation of knowledge and skills and the exchange of information
- this part of the PhD- study focuses on the impact of the redesign in the last year of the curriculum at the Faculty of Pharmaceutical Scienses (CSCLE) on the educational outcomes

  - pharmaceutical discipline-related knowledge
  - general societal competences
  - research-related competences

CSCLE – Research Design (quasi-experimental)

- entire student population of the last year was involved
  ⇒ N = 77

- participation was obligatory (since the internship is a formal part of the study programme)

- students were assigned at random in groups of 7-8 students

- independent variables:
  → roles (e.g., moderator, "summarizer", …)
    - some students were assigned with roles, the others were not ⇒ impact of the roles could be studied
    - the impact of the different roles could be studied
  → (pharmaceutical) nature of the cases (toothextraction, migraine, …)
    - since the cases differ in subjects, this impact could likewise be studied

CSCLE – Research Design (quasi-experimental)

➔ **Integrated Curriculum Score** (ICS):

= the relation between the different subjects of the curriculum that appear in one's contributions and the total of different subjects of the curriculum that should appear (according to specialists in the discipline)

➔ **Indirect outcome measurements:**

- number of contributions
- types of contributions
- level of knowledge construction (model of Veerman *et al.*)

→
- new information-facts
- new information-experience/opinion
- new information-theoretical idea
- explicitation
- evaluation

CSCLE – Research Design (quasi-experimental)

Hypothesis 1:

The nature of the case has an impact on the dependent variables: ICS and LKC

Hypothesis 2:

Role assignment has a beneficial impact on the dependent variables: ICS and LKC ⇒ Students with 'roles' will attain higher ICS and/or higher LKC

Hypothesis 3:

The nature of the role assigned has an impact on the dependent variables: ICS and LKC

➔ These hypotheses were tested

CSCLE – Analysis procedure

- unit of analysis = 1 contribution by 1 student

↳ 1559 units of analysis were coded

↙ ↘

6% non-task-oriented

94% task-oriented

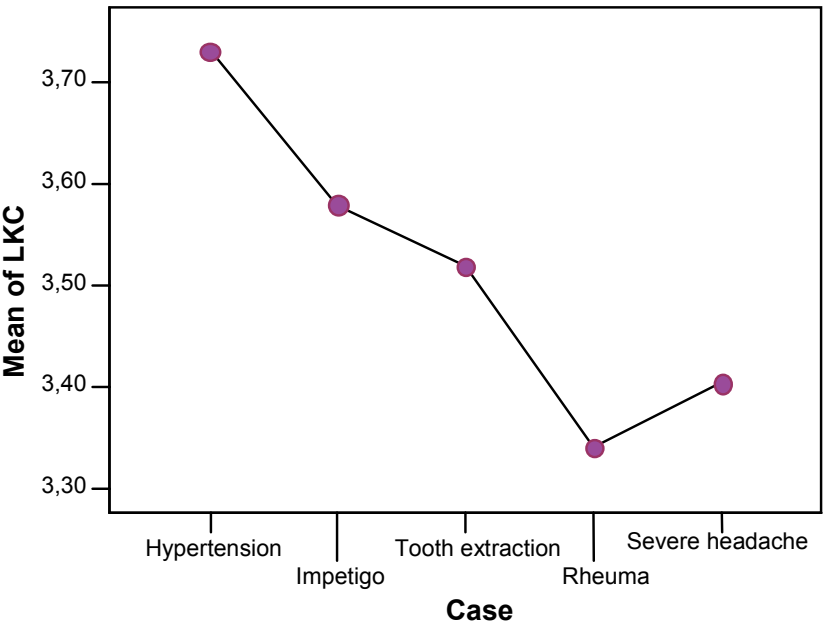
⇒ 1466 contributions

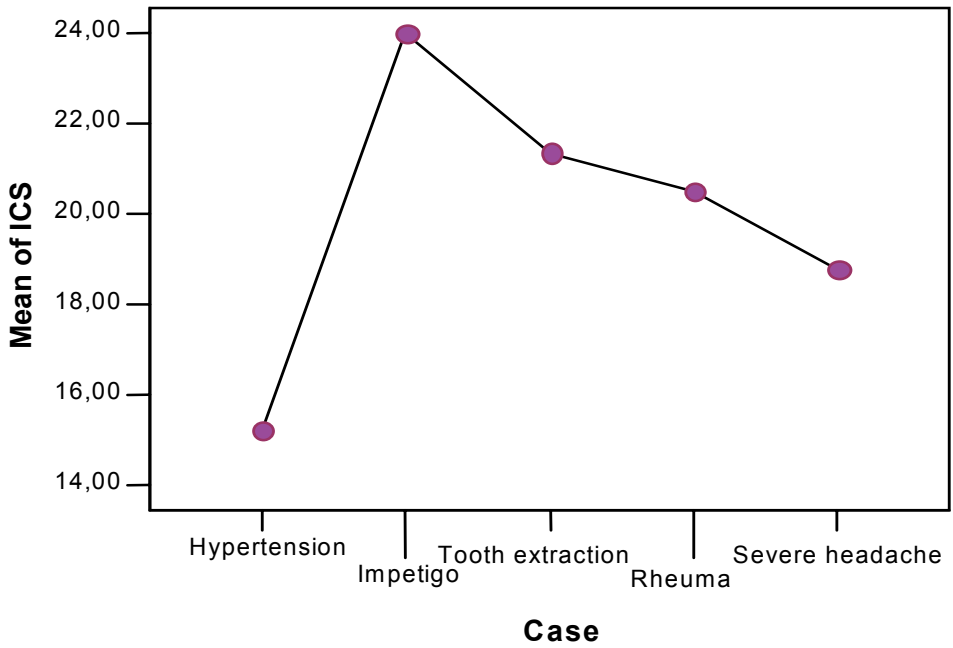
↓

coded on the base of the model of Veerman *et al.* (LKC) and the ICS

CSCLE – Results and discussion

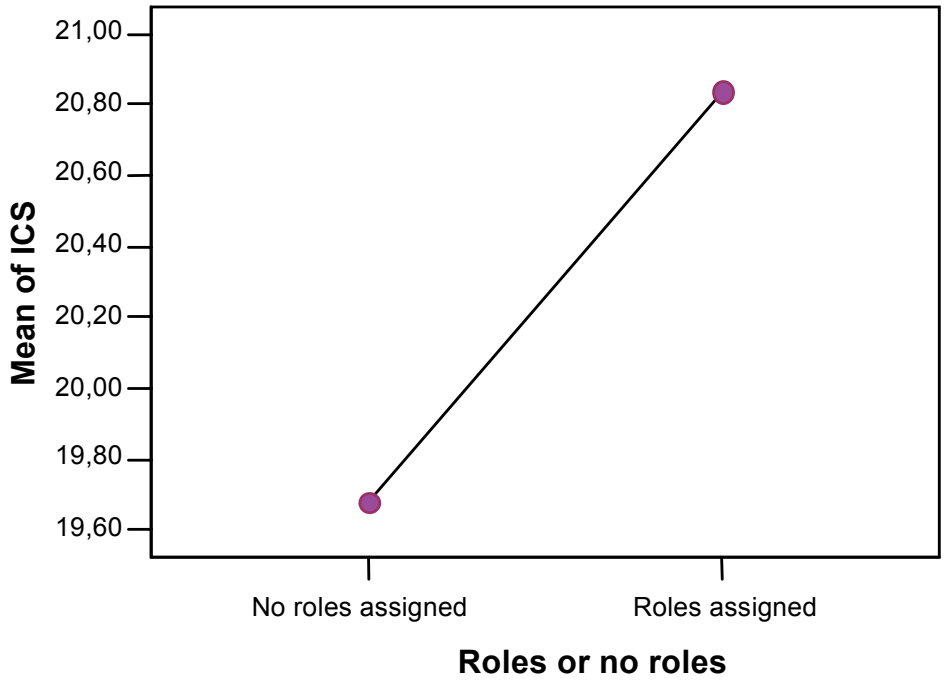
Hypothesis 1:





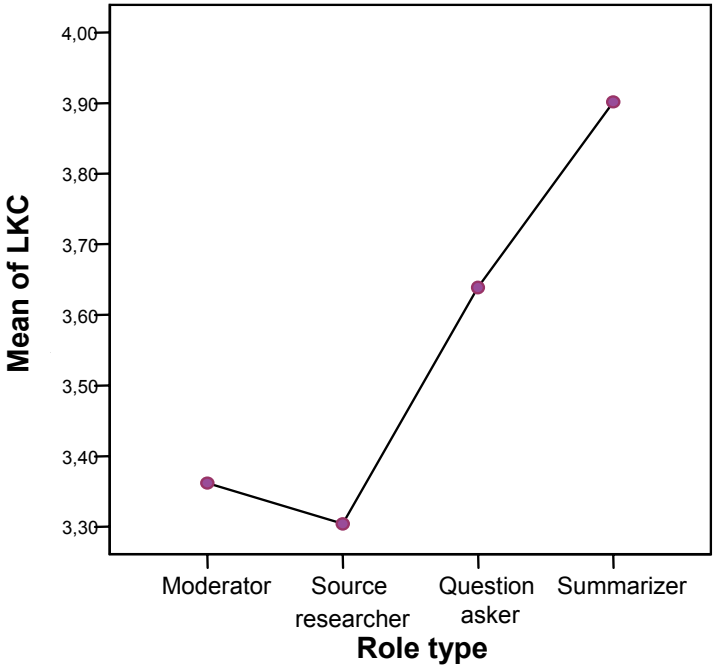
CSCLE – Results and discussion

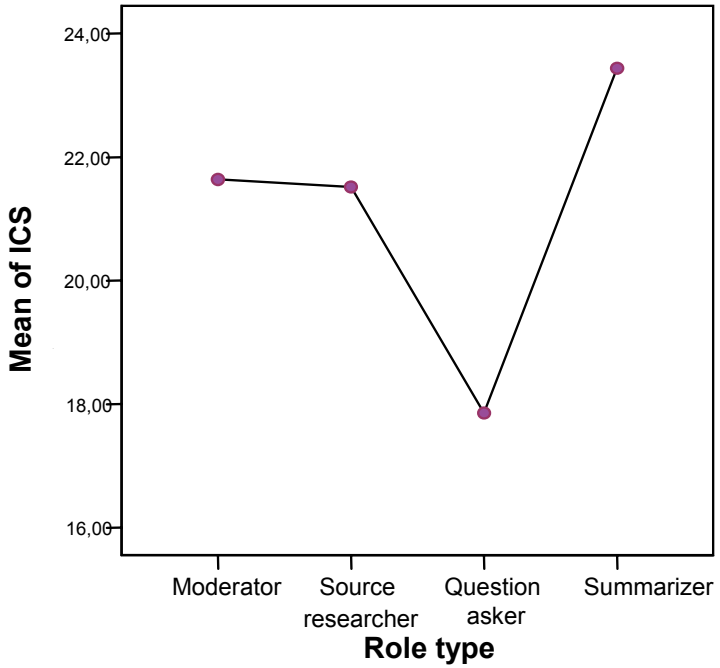
Hypothesis 2:



CSCLE – Results and discussion

Hypothesis 3:





CSCLE – Conclusion and Future Perspectives

- **Aim** of the study: evaluation of the impact of an innovative instructional design of internships in view of a new integrated pharmaceutical curriculum.

- **Key element**: implementation of a Computer Supported Collaborative Learning Environment.

- Students were expected to work in a systematic and collaborative way in discussing and solving **real life** cases. Students in the role condition were assigned specific roles.

- The nature of the cases was an additional critical variable in the study.

➔ Results of the study:

both independent variables (role assignment and nature of the cases) have an impact, especially on the attainment of objectives of the new integrated pharmaceutical curriculum

CSCLE – Conclusion and Future Perspectives

- *the results of this study were promising*

  ⇒ the Faculty of Pharmaceutical Sciences at the Ghent University has decided to officially implement the CSCLE in the last year of the curriculum (in the context of the changing educational programme)

- *the remarks and weaknesses that came out of this study are taken into account*

  ⇒ every student is assigned a role

  ⇒ there will be paid extra attention to the nature of the cases

- *study is not finished yet*

  → ICS of every student for every case will be linked with former scores of the students for certain subjects of the curriculum

  → there is given feedback to the students and research will show if this has an impact on the ICS and/or the LKC

Acknowledgments

- Prof. Willy R.G. Baeyens

- the Organizing Committee of the EUFEPS workshop