POLYTECH MARSEILLE
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IMPORTING COOPERATIVE PEDAGOGY INTO POSTGRADUATE COURSES – AN EXPERIMENT

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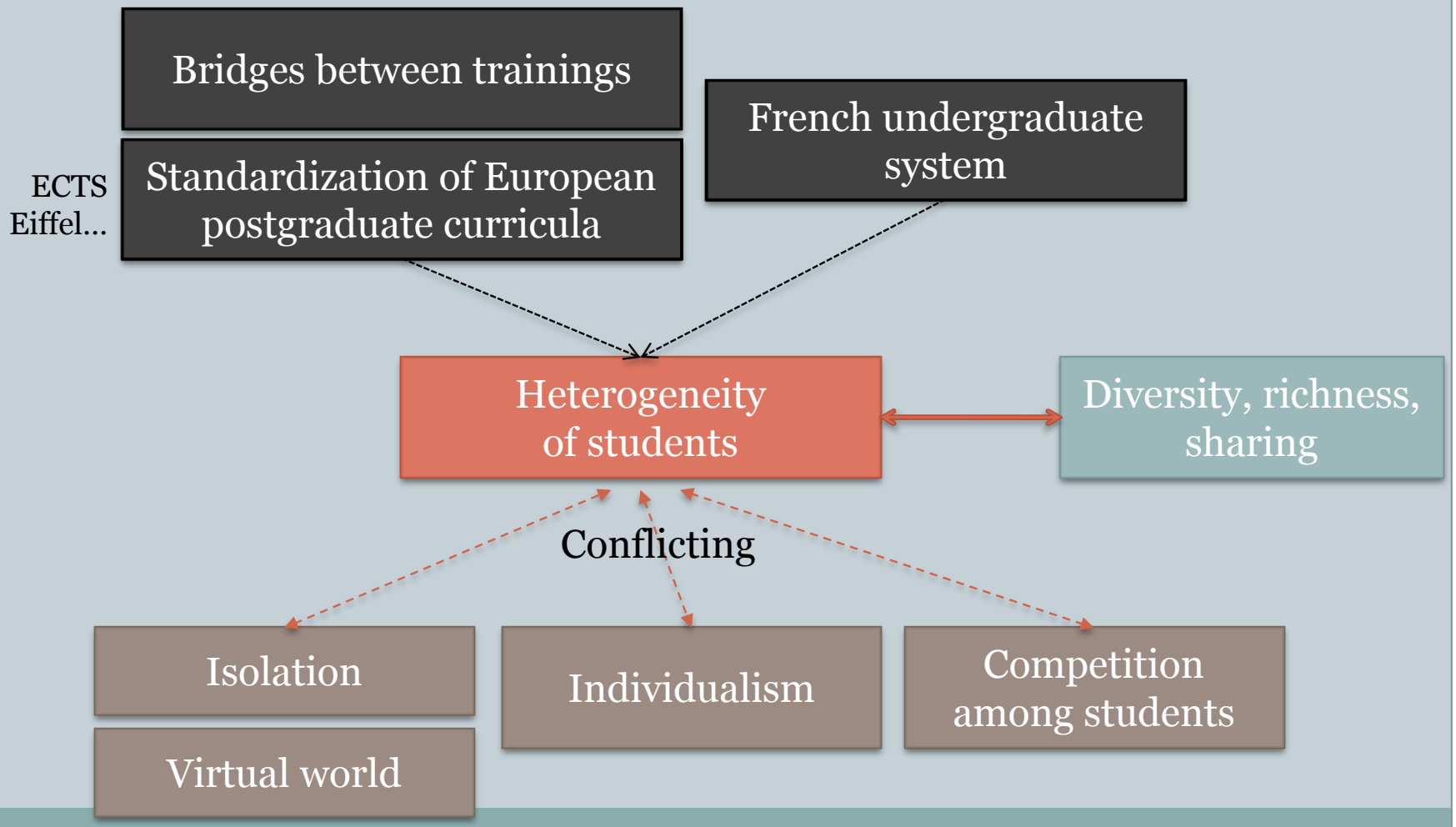
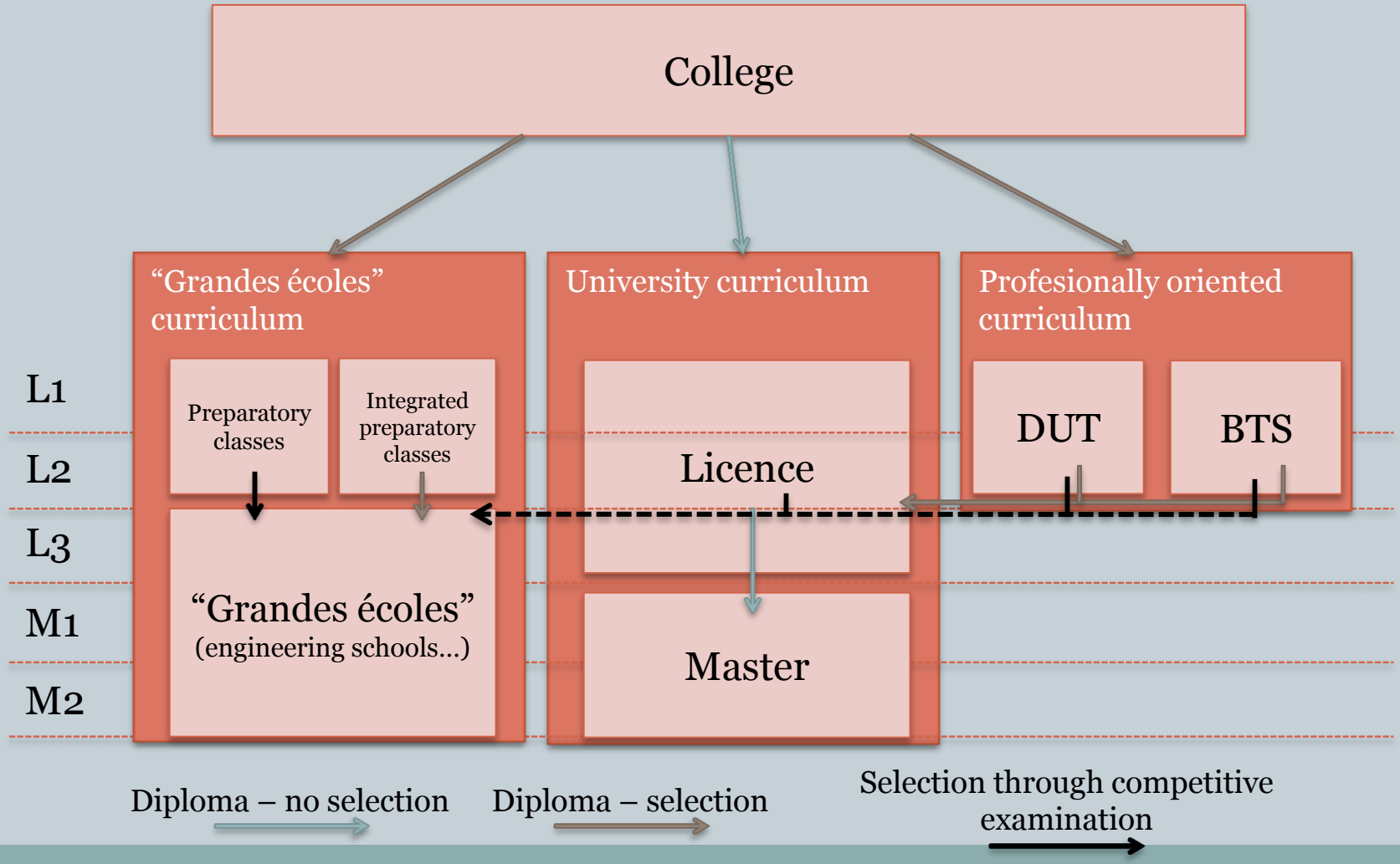
Introduction

General outlines

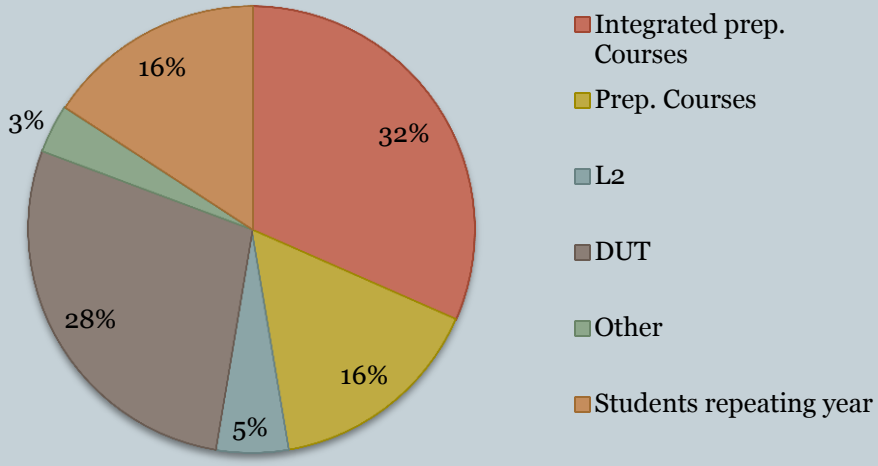


French Undergraduate System



Context of the experiment

- Polytech Marseille engineering school
  - Heterogeneous population of 57 students
  - First year Algebra course:
    - L1/L2 upgrading of skills in theoretical Algebra
    - L3 notions (specific to the Computer Science training)



…/… Context of the experiment

- Polytech Marseille engineering school
  - Curriculum
  - Training context (engineering school)
  - Weekly schedules

already defined

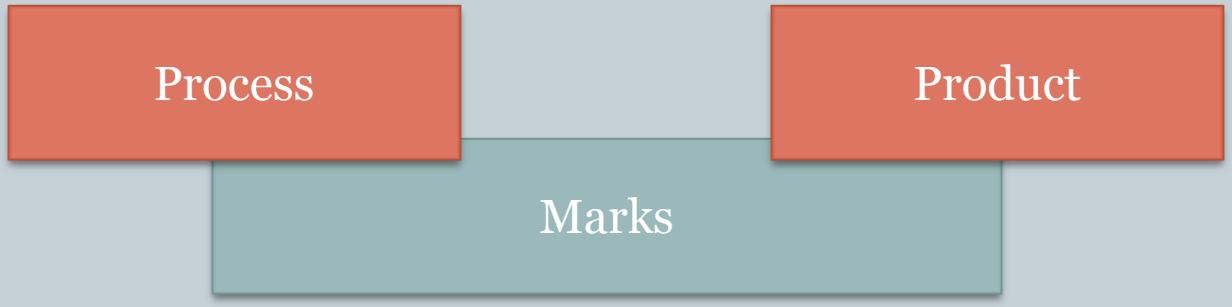
Importing cooperative pedagogy in this context as is

State of art

- How to set up peer assessment?
- How to integrate it with the group mark?
  - Goldfinch and Raeside's [1990]: peer assessment factor
  - Conway and al. [1993]:
    - IWF: individual weighting factor
    - Group mark: students & teacher

…/… State of art

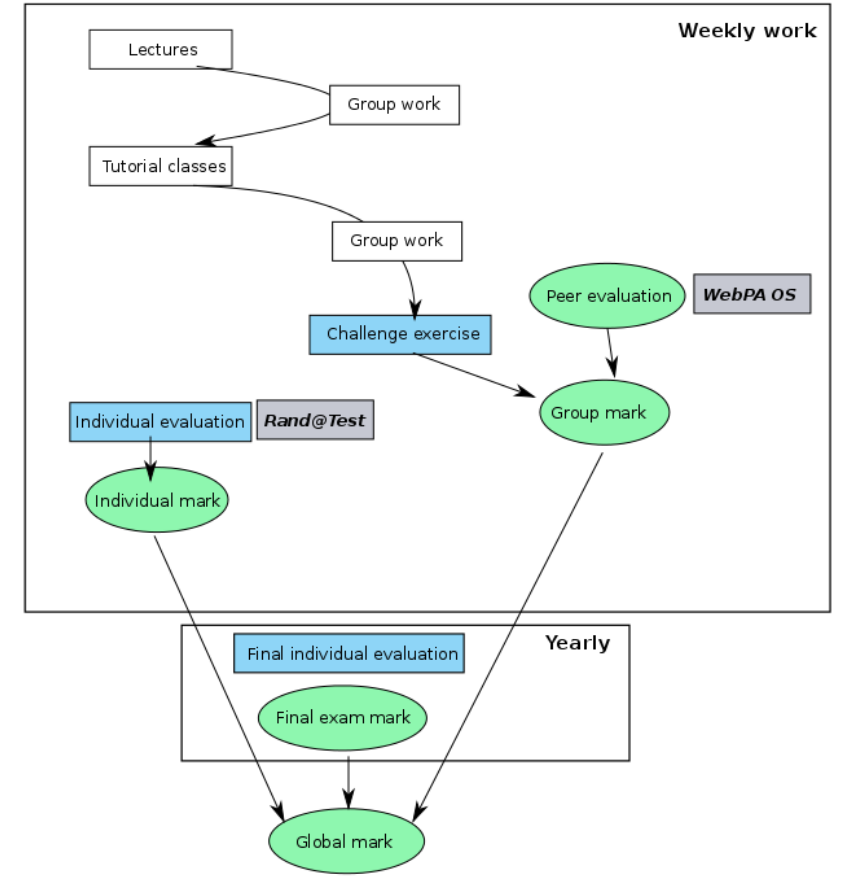
- Gatfield [1999]:
  - 50% group mark / 50% weighted with IWF
- Cheng and Warren [2000]: (after Conway and al.)
  - IWF weighting: more discriminating to assess contributions made by individual students
- Lejk and Wyvill [2001]:
  - Self vs. peer assessment
  - Peer assessment without self assessment is more discriminating



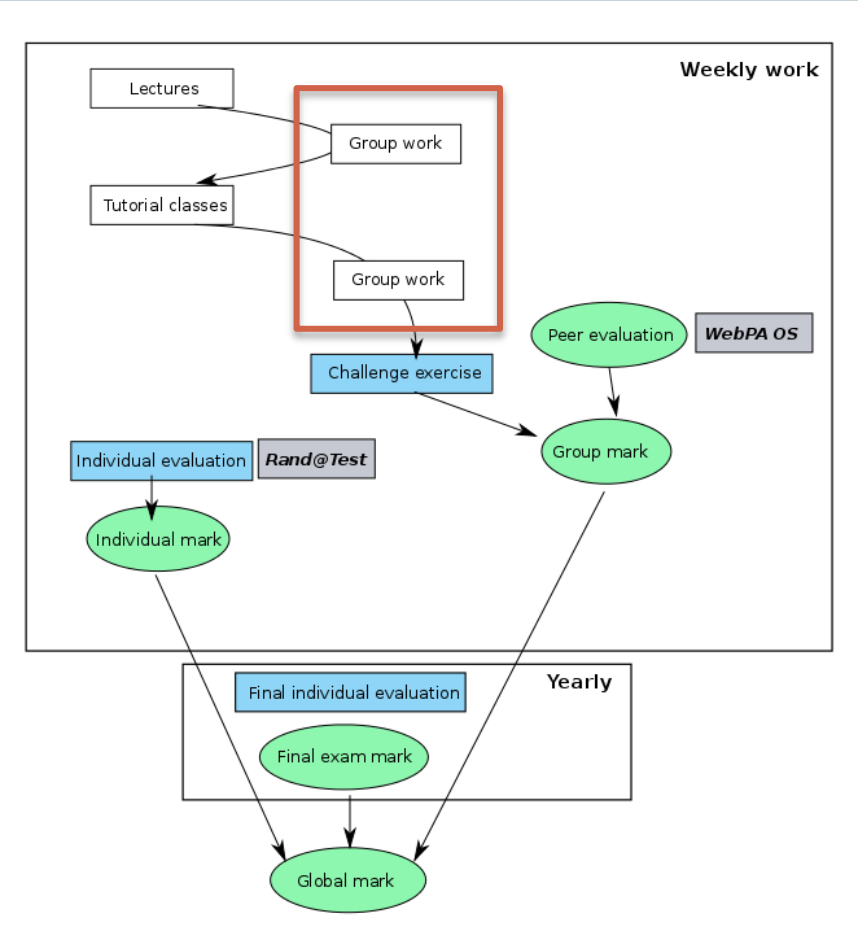
Description

Group work

- Efficiency of
  - proper balan
    - group work
    - individual e



…/… Group work



Groups:

- Homogeneous heterogeneity
- 5 to 6 students

Group work 1:

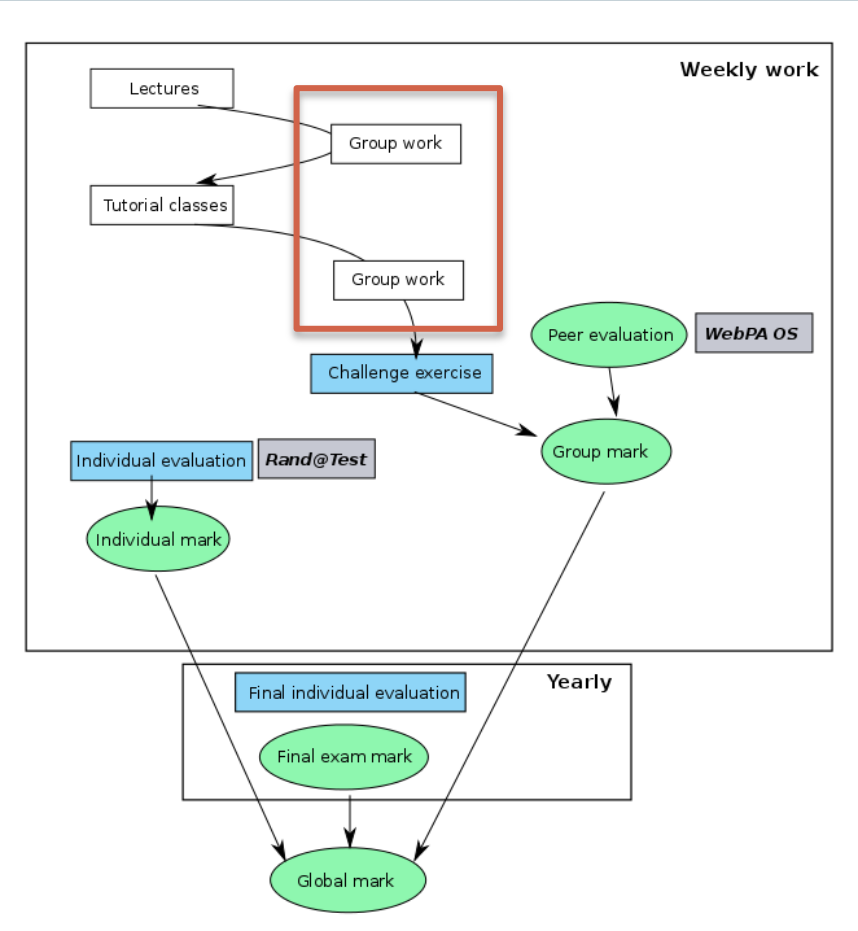
- Prepare tutorials

- **Fundamental exercises**
- Training exercises (personal work)

Group work 2:

- Prepare “challenge” exercise
- Check understanding of tutorials

…/… Group work

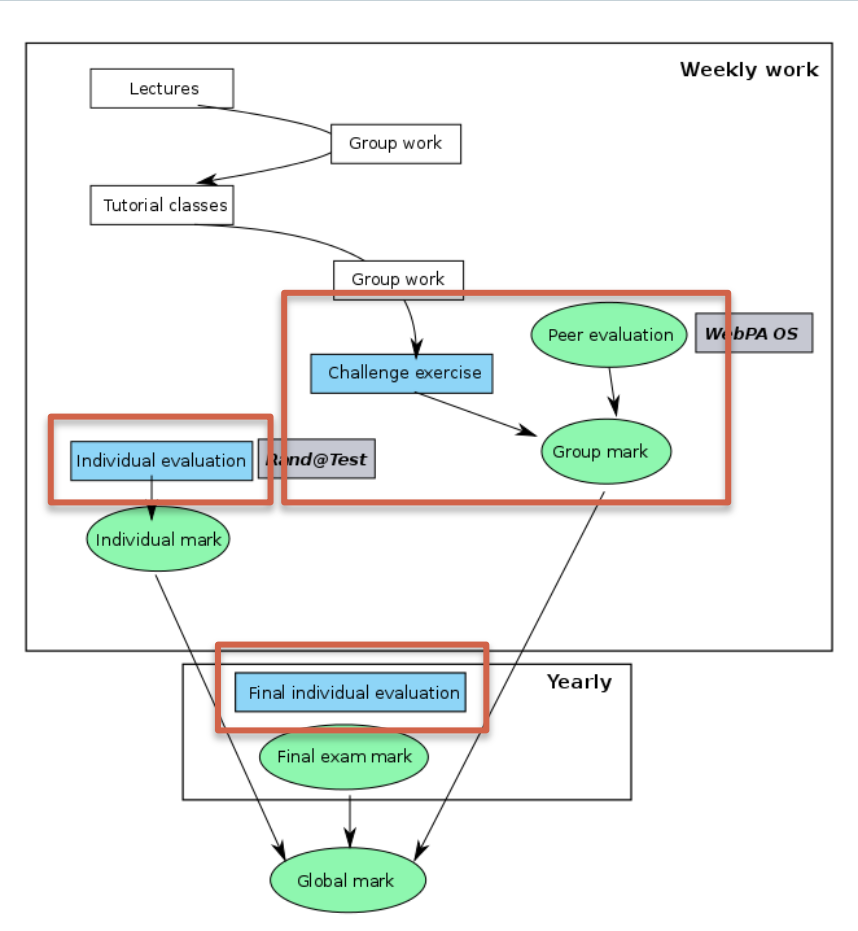


Groups (self)organization:

- 4 roles:
  - Facilitator
  - Secretary
  - Moderator
  - Writer

- Create group dynamics
- Develop autonomy, self-evaluation, collaboration skills of students

Evaluation – goals and means



Approach:

- help students to consider marks as a **tool** rather than a **goal**
- uses this erroneous belief as an engine

Individual evaluation

Group evaluation

Weekly individual evaluation (random individual tests – Rand@Test)

- Challenge exercise
- Peer evaluation (WebPA OS)

Final individual test

…/… Evaluation – goals and means

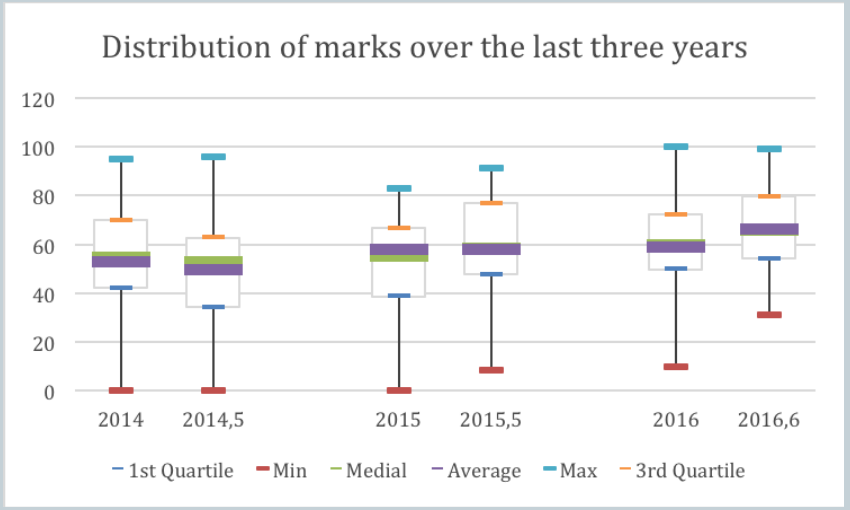
- Rand@Test:
  - Generate “random” individual tests
- WebPA:
  - Peer evaluation -> weighting of group marks
  - 4 criteria (rated 0…3):
    1) technical contribution
    2) organizational contribution,
    3) contribution in raising questions and exchanging,
    4) cooperative contribution

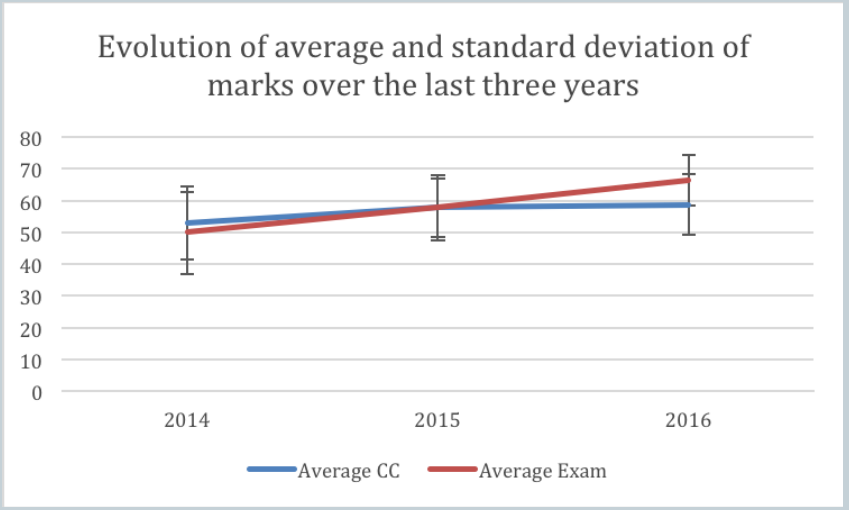
Results

Results

- The system is still young, analysis is difficult:
  - Individual weekly assessment: introduced 3 years ago
  - Group work: since only 1 year
- Assessment of results:
  - Evolution of marks (weekly evaluation and final exam) over 3 years
  - Peer evaluation – compute correlation between:
    - individual group marks (group mark / peer evaluation)
    - individual weekly tests
  - Self-assessment skill of students

Evolution of marks





left: weekly evaluation / right: final test

- Facts:
  - average final exam mark increased by 10 points
  - medial and third quartiles: roughly similar
  - first quartile reached academically average
- Analysis:
  - team work has a perceptible impact on students marks (bias could not be estimated from available data)
  - best and average students stay at the same level
  - weakest students tended to have better marks

Peer evaluation impact

- Difficult to assess after only 1 year
- Correlation between (Pearson):
  - Individual group mark – group mark weighted by peer evaluation
  - Individual weekly tests

0,37 (low)

…/… Peer evaluation impact

- According to anonymous synthesis from students:
  - difficulties lowering peer evaluations
    - Solution: larger scale (0..10)
  - weakest students rely on group "leaders"
    - More intermediate questions in challenge exercises

- Challenging ➔ group dynamics
- Progressive ➔ participation of weakest students

Self-assessment skill

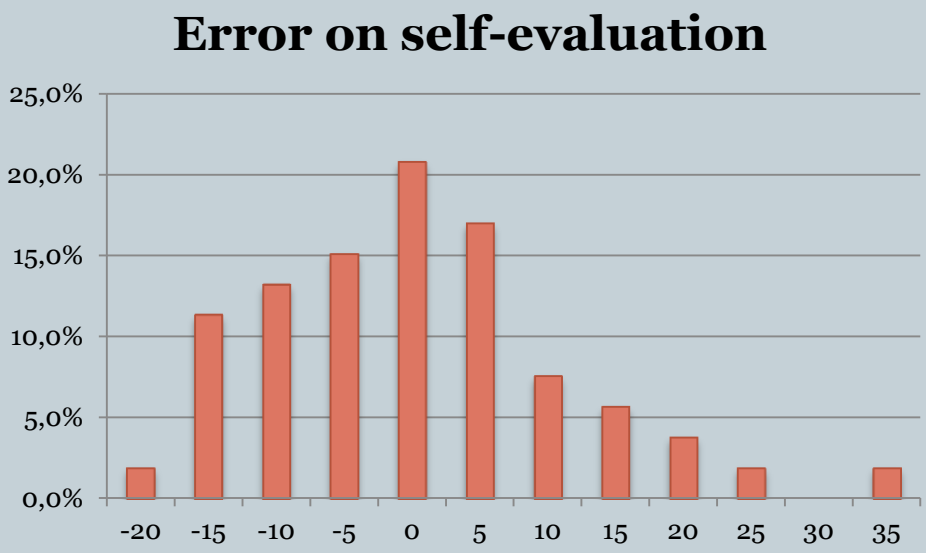
- Why assessing this skill:
  - cognitive psychology (Kruger & Dunning, 1999)
    - skills improve self-assessment
  - recent works in neuro-pedagogy
    - testing is almost as important in the learning process as lectures themselves
- Final exam:
  - Evaluate the expected mark anonymously

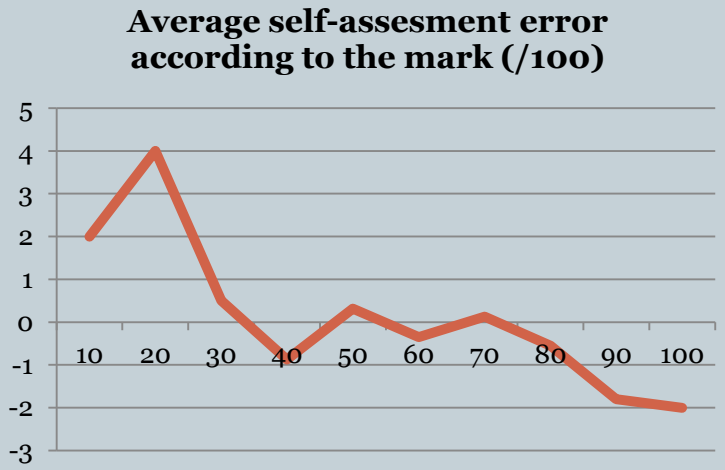
…/… Self-assessment skill

- Correlation (Pearson):

0,83 (very high)

Average (abs)	8.8
Stdev (abs)	7
Medial	-2.5





Conclusion

Conclusion

- First and young experiment
- Students enthusiastic about this process
- Strengths:
  - Helped weakest students
  - Improved relationships between students
  - Better self-evaluation
- Weaknesses:
  - Peer evaluation should be reworked
  - Better understanding of the process needed