Individual Peer Assessed Contribution to group work (IPAC)

by the IPAC Consortium
List of abstracts covered in this session

- **IPAC - Individual Peer Assessment of Contribution to group work** by Pilar Garcia Souto et al.
- **What do students think of the IPAC method** by Ryan Grammenos et al.
- **Staff moderations when using IPAC** by Cicely Striolo
- **Comparison of technical platforms for running IPAC** by Mira Vogel
- **Home-made and readily available IPAC tool – Run your practice your way and efficiently** by Pilar Garcia Souto
- **Case study: Making group work easier for the lecturer with IPAC** by Cloda Jenkins
- **Case study: Influence of peer assessments on students and assessors in capstone group design projects** by Will Newton and Eral Bele
- **Case study: Using IPAC across disciplines and methodologies- what are the typical marks given by students to peers?** by Pilar Garcia Souto
- **Training students to utilise peer feedback for self-reflections** by Folashade Akinmolayan
IPAC
Individual Peer Assessed Contribution to group work

Why?

- Staff and students across UCL are concerned about the fairness of group assessment as this can greatly damage the student experience.
  - Different levels of peers’ engagement to group work?
  - Individual mark needed vs a group mark
  - Reflected into the NSS comments 2016 (might increase as group work increases)

- IPAC can be included in group work so students get individual marks based on their contribution as assessed by peers instead of a group mark. This aims to promote student engagement and tackles associated problems.
IPAC – How does it work?

GROUP MARK

INDIVIDUAL MARKS

IPAC (tutor moderated)

peers

tutor

Pilar Garcia Souto
<table>
<thead>
<tr>
<th>Benefits</th>
<th>Limitations</th>
</tr>
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<tbody>
<tr>
<td>• Promotes student engagement and tackles associated problems.</td>
<td>• Additional deadline and assessment for students.</td>
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<tr>
<td>• Peer and self assessment (includes self reflection)</td>
<td>• Big amount of data/information for tutor (system needed or very staff time consuming)</td>
</tr>
<tr>
<td>• Practice to give meaningful and tactful feedback.</td>
<td>• Requires students’ training.</td>
</tr>
<tr>
<td>• Students understand how their personal contribution is perceived?</td>
<td>• Might require case by case moderation in extreme situations of dysfunctional group.</td>
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<tr>
<td>• Fairer mark.</td>
<td>• (Student gaming?)</td>
</tr>
<tr>
<td>• Better understanding of group dynamics by tutor.</td>
<td>• (Student alliances?)</td>
</tr>
</tbody>
</table>

Pilar Garcia Souto
1. IPAC Consortium

Who are we?

- Over 40 staff members from 20 departments who are either contributing to the consortium or interested in using the outcomes.
- Various students from 3 departments.
Our work: enquiring

staff

institution

students

Literature review

Commercial systems
Our work: defining and developing

Key elements of the methodology and options

Guidelines and recommendations

In-house IPAC system

Support to practitioners
IPAC – our work

https://wiki.ucl.ac.uk/display/IC/IPAC

Pilar Garcia Souto
2. Key elements of IPAC methodology and Methodology recommendations

Key elements of the methodology and options

Guidelines and recommendations
(under development)

Pilar Garcia Souto
3. Student perception

students
Data collection

• **Anonymous questionnaires**
  – Run on Moodle
  – Surveyed 89 people.
  – 12 departments, mainly Engineering Faculty.
  – First year undergraduates through to PhD students.
  – March 2017 to June 2017.

• **Focus groups**
  – Run by students
  – 4 focus groups, two in March 2017 and 2 in June 2017
  – 44 students participated in total
  – Population:
    • Undergraduates to PhD students
    • Mainly Engineering Faculty
    • Experience with group work
### Key result: FEED...BACK – To understand and reflect.
Key outcomes

- 92% in favour of peer assessment [Q16].
- 79% in favour of IPAC [Q19, Q20].

Main points: (PTSF-PTJCF)
1. Purpose.
2. Transparency.
3. Size of class.
4. Frequency of group work.
5. Proper Training.
6. Justification of marks.
7. Criteria.

Take Away Message: Please treat students fairly, providing them justified & constructive feedback (PTSF-PTJCF)

Ryan Grammenos
Analysis of main points: PTSF-PTJCF

1. **Purpose:** [Q3]
   The concept of peer assessment has to be introduced and its usefulness clearly explained.

2. **Transparency:** [Q3]
   Students should not feel they are an experiment. The entire PA process should be visible.

3. **Size of class:** [Q5, Q9, Q12]
   Small classes make it almost impossible to preserve anonymity. Need to account for this carefully.

4. **Frequency of group work:** [Q5, Q9, Q12]
   If the same groups (from small classes?) work on different projects over a long period, a “vendetta” situation might arise.

5. **Proper Training:** [Q16, Q20]
   Clear guidelines should be given to students. They must be trained prior to official assessment.

6. **Justification of marks:** [Q3, Q11, Q13]
   Justification must be based on feedback. Students feel moral responsibility to pass everyone.

7. **Criteria:** [Q8]
   Criteria must be phrased properly. Students’ understanding of all criteria must be checked.

8. **Feedback:** [Q3, Q6, Q7, Q10]
   Should be continuous and regular, initially formative (to warn) and then summative (to award).
Current work in progress

- Preparing a paper on the student perceptions of IPAC for submission to the *Journal on Assessment & Evaluation in Higher Education*.
- Case study on the ChangeMakers project is being prepared for contribution towards a wider research study carried out by the UCL ChangeMakers team.
  - Aimed at understanding nature and impact of staff-student partnership.
4. Staff moderations when using IPAC
Research Questions and Description

How do staff perceive peer assessment of individual contribution?

- Interviews of staff who are IPAC Consortium Members
- Case study of reported techniques

How do staff moderate IPAC Marks?

Cicely Striolo
Context: Background Characteristics and Commonalities of Peer Assessment at UCL

- **Primary Aims:** Provide insight to group dynamics
- Assessment is **not** replacing teacher assessment of technical content
- **Process is labour intensive**
- All student assessments are summative
- Most approach the peer assessment with the intent of ensuring anonymity
- All IPAC implemented is at the undergraduate level

<table>
<thead>
<tr>
<th>User Faculty</th>
<th>Intent</th>
<th>Staff Satisfied</th>
<th>Module Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng Sci</td>
<td>Judge individual effort</td>
<td>Yes</td>
<td>400+</td>
</tr>
<tr>
<td>Eng Sci</td>
<td>Student satisfaction</td>
<td>Mostly</td>
<td>140-160</td>
</tr>
<tr>
<td>Joint*</td>
<td>Assess group functionality</td>
<td>Mostly</td>
<td>45</td>
</tr>
<tr>
<td>Eng Sci**</td>
<td>Assess team skills</td>
<td>No</td>
<td>35 (MSc)</td>
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</tbody>
</table>

*Arts and Sciences Degree
** IPAC not implemented
Actual Practice vs Literature

Staff Practice

• ALL students are trained, informed of consequences and provided guidelines or rubrics to conduct their peer assessments

• Students conduct both external-facing and reflective assessments

• Marks are reinforced by free comment to justify the mark given

• Staff offer alternate assessment, and nullify student assessments that did not follow the guidelines or try to ‘game’ the system in place- as promised when IPAC was being introduced

Literature

• “Students should understand and acknowledge the purpose, importance & usefulness of the procedure…” (Cheng & Warren, 2000)

• “Students are less likely to attempt free riding [or other negative behaviour] when the practice has been discussed, exposed, and condemned in class.” (King & Behnke, 2005)

• Peer assessment can lead to learning how to give and receive criticism and how to discern helpful from unhelpful criticism. (Topping, 2009)
5. Comparison of technical platforms for running IPAC

Commercial systems
Needs

- Easy to use for students and staff,
- Easily accessible by students (integrates with Moodle),
- Customizable for staff,
- Complies with data protection regulations,
- Provides the raw data,
- Provides calculated values with transparent methodology,
- Option among some methodologies,
- Allow for choice of self-assessment,
- Provides a range of feedback to the students,
- Makes feedback anonymous.
Comparison of platforms

Available to UCL people:
https://wiki.ucl.ac.uk/x/cke_Aw

Based on
• group walkthroughs,
• presentations,
• Changemakers student project.
Summary of platforms

**WebPA®**
- Likert scale or Split 100
- Feedback possible but awkward.
- Integrates with Moodle.
- Free and open
- Not hosted.

**CATME**
- Restricted to existing question bank.
- No Moodle integration.
- Sophisticated team-building.
- Commercially hosted, $2 per year per student.

**TEAMMATES**
- Customisable questions.
- Tutor control over feedback.
- Free hosted service.

**SPARKPLUS**
- Detects free-riders and over-raters.
- Customisable questions and scales.
- Visualisations.
- Tutor control over feedback.
- Commercially hosted.
6. Home-made available IPAC tool – Run your practice your way and efficiently

In-house IPAC system
Developed IPAC system - How it works

Students complete questionnaire (template available) (10-60 mins)

Organize and analyse data (only needs a PC/laptop) (5 mins)

Give quick and personalized feedback to students (summative and formative) (5 mins)

In-house IPAC system

Pilar Garcia Souto
• Live demonstration

(for divulgation, snap shots of the demonstration are provided)
Student view of the system (uses Moodle)

Completely customizable:
- N of students
- N of questions
- N of levels per criteria
- Description of levels in each criteria
- Text
- Justification included (optional)

Pilar Garcia Souto
Main screen of the system

- Select the input files
  - Team composition file
  - Questionnaire file downloaded from Moodle
- Summary updates automatically for verification
- Click RUN to process the data
- Help - documentation
The system is customizable, allowing each tutor to run IPAC with their specifications, e.g.:

- Choose among various calculation methods
- Choose moderation
- Use multiple questionnaires at once
- Activate profanity checker
- Self-assessment
- Equal or unequal criteria weightings
- Select feedback that is given to students
- Save the settings for next time!
Help - documentation

Getting Started

Installation

1. Extract the files in ipacTool.zip to a folder.
2. Navigate to that folder.
3. Launch IPAC.exe.

Using the Tool

Once you've launched IPAC.exe follow the following steps below to carry out your first data process.

Setting up your Settings Profile

- Click the 'Settings' button. This should open the settings page.
- Click the New Settings button.
- Fill in the necessary fields.
  - Output save location is the folder where the output files would be saved. Use the 'Edit' button to select the folder or enter the folder location manually into the textbox.
  - Select a normalisation method. For more information on which method is best for you, have a look at the normalisation section of the documentation.
Output: Organized data per group, student, and criteria

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Assessment Criterion 1</th>
<th>Assessment Criterion 2</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>IPAC Factor</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>Group 1</td>
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</tr>
<tr>
<td>Group 4</td>
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</table>

Pilar Garcia Souto
Feedback to students (uploads into Moodle)

Organised data per group, student, criteria, ... with mean and SD calculated

Pilar Garcia Souto

<table>
<thead>
<tr>
<th>Name</th>
<th>Email Address</th>
<th>IPAC Score</th>
<th>C1 Average</th>
<th>C2 Average</th>
<th>C3 Average</th>
<th>C4 Average</th>
<th>C5 Average</th>
<th>C6 Average</th>
<th>Overall Weight</th>
<th>Comments feedback</th>
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<td><a href="mailto:dmendelev@ucl.ac.uk">dmendelev@ucl.ac.uk</a></td>
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<td>Enrico Fermi</td>
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<td>4.33</td>
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<td>4.56</td>
<td>4.5 marks received per</td>
</tr>
</tbody>
</table>

Pilar Garcia Souto
Import marks and feedback into Moodle grade book

Few clicks and ... feedback and marks provided to all students!
QUESTIONS SO FAR

before moving to case studies?
7. **Case study: Making group work easier for lecturer with IPAC**

- Testing
- staff
- students
Group working is important for life so I have built it into my courses for the last four years.

**Logistics (10 week term)**
- Assign teams in week 2
- Presentation in week 7
- Report (wiki/word) in week 10

**Marking**
- 30% of assessment
- Expectation of everyone getting group mark
- Lower mark for poor individual contribution?

**Project and team organisation**
- Leave team to decide how to take project forward
Life before IPAC – evidence on individual contribution

- Attendance and group dynamics at lectures and compulsory seminars
- Performance in group presentation
- For one course, individual contribution to Moodle wiki
- Peer complaints – email/office hours
- Student response to chasing emails if missed compulsory seminars
- Student response to chasing emails if concerns raised by peers

Poor quality, random and qualitative information on individual contribution
Only adjusted for group mark if hardly any sign of the student during the term
Free-riding and ‘unfairness’ of group mark common theme in module feedback

Cloda Jenkins
Introduced IPAC as part of wider set of information on individual contribution

- Compulsory project-linked seminars weeks 3, 6, and 9 (mark out of 1 for each)
- Presentation in week 7 (mark out of 1)
- Complete peer feedback quiz in weeks 4, 8 and 10 ['quick’ to give feedback to students] (mark out of 1 for each)
- Wiki activity [for one of the two courses] (no marks*)
- IPAC score in weeks 4, 8 and 10 [students get score and comments]
Information on individual contribution affects individual mark

- +/-5% of group mark for outliers
  - Participation score (out of 1): average of scores for attendance, participation in presentation and completion of quizzes
  - Average IPAC score
- Raised issues with individuals mid-term to give right to reply and opportunity to adapt
- Recognised improvement over time

Transparent approach. Students engaging with each other as well as me. Far less discussion in office hours/by email

Cloda Jenkins
## Adjustment rules

<table>
<thead>
<tr>
<th>Participation score (out of 1)</th>
<th>IPAC score (on track=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=0.75</td>
<td>Less than 0.45</td>
</tr>
<tr>
<td>0.65-0.74</td>
<td>Minus 5%</td>
</tr>
<tr>
<td>0.55-0.64</td>
<td>Minus 1%</td>
</tr>
<tr>
<td>0.45-0.54</td>
<td>Minus 2%</td>
</tr>
<tr>
<td>0.35-0.44</td>
<td>Minus 4%</td>
</tr>
<tr>
<td>Less than 0.34</td>
<td>Minus 5%</td>
</tr>
<tr>
<td>0.45-0.54</td>
<td>0.65-0.74</td>
</tr>
<tr>
<td>0.75-0.84</td>
<td>Minus 2%</td>
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<tr>
<td>0.85-1.03</td>
<td>No adjustment</td>
</tr>
<tr>
<td>1.04-1.06</td>
<td>Plus 1%</td>
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<tr>
<td>1.07-1.09</td>
<td>Plus 2%</td>
</tr>
<tr>
<td>1.10-1.12</td>
<td>Plus 3%</td>
</tr>
<tr>
<td>1.13-1.15</td>
<td>Plus 4%</td>
</tr>
<tr>
<td>&gt;1.15</td>
<td>Plus 5%</td>
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</table>
Lessons learned (so far)

- Fewer issues in my inbox/at my door
  - Did worst cases engage with peer feedback?
  - Were some students too nice, particularly in the beginning?
- I need to be more explicit upfront about how I’m going to make adjustments next year
- I’m not very ‘tech’ but this tool made getting and sharing feedback easy/quick

Helped to have existing tool to analyse individual contribution
Still like to see group dynamic face-to-face as well.

Cloda Jenkins
It is not (just) about making my life easier

Giving and receiving feedback is important for life

- Learn to give constructive/polite feedback
- Learn to reflect on feedback
- Learn to regroup as a team in challenging times

Challenges of team working not gone away
Face them and deal with them

Cloda Jenkins
8. Case study: Influence of peer assessment on students and assessors in capstone group design projects

Testing

staff

students
MEng Capstone Group Design Project in Mechanical Engineering

• Year-long group design project. Groups of 5-12 students, supervised by an academic or industry partner.
• 2-credit module (50% of 4th year credits)
MEng Capstone Group Design Project in Mechanical Engineering

• Assessment distribution: 90% team – 10% individual

• Before 2016: no modification of team grade for individual members, or normalisation by the individual grade

• Last 2 years: use of peer assessment with the following pattern:
  – 4 assessments yearly, typically after major milestones
  – Assessment results are made available to supervisors and students, but only supervisors can view free-text comments
  – Supervisors interview individual students twice a year, and grade performance (both observed and peer-assessed)
  – In the end of the year, supervisors suggest distribution of team grades through multiplicative factors, by moderating IPAC scores; final moderation is done by module coordinators

Will Newton and Eral Bele
Objectives of Peer Assessment

1. Fair representation of individual contributions

   Effective Formative Evaluation
2. Students: Can get periodic feedback on how well they are doing within the team
3. Students: Can push team members who have not performed well to do better
4. Supervisors: Can detect hidden team problems and advise or act on them

   Effective Summative Evaluation
5. Supervisors: Can assess fairly contribution of individual team members

Have we achieved these objectives? A series of questions were posed to students and supervisors...
1. Fairness of Evaluation

How representative of the contribution (i.e. fair) were the peer assessment grades?

![Bar chart showing percentage of students and supervisors by rate (1-5). Rate 1-5: 1 = min; 5 = max. Students: low percentage at rate 1 and 2, high percentage at rate 4. Supervisors: high percentage at rate 4, low at rate 1 and 2.]

Will Newton and Eral Bele
1. Fairness of Evaluation

Student Comments:
• Since team members often think their own grade is affected by what they give someone else, they tend to give lower scores so their average is higher.
• The grading range is not wide enough a fair measure of the contribution.
• The rather indirect approach/inconvenience of having us refer to the questions and then the grade might mean that some of us won't check the feedback at all.

Supervisor Comments:
• The first peer assessment correctly identified one group member, who had not fully contributed, on the second assessment they decided ‘to be nice to each other’.
• It seems that some students hesitate to highlight a poor performance and mark their peers low. They may also feel betraying their peers.
• Inertial effects: I have one student who has contributed well this term but is still being marked down, whereas another put in a good performance last term, but lousy this term and still gets a good assessment.
2. Effectiveness in Formative Assessment

Did it help you identify areas where you could improve your contribution to the team?

Did it help you identify areas where your team appreciated excellence in your contribution?

Was the peer assessment effective in improving the contribution of under-performing team members?

Usefulness in improving your contribution

Usefulness in improving accountability
2. Effectiveness in Formative Assessment

Student Comments:

• The lack of open feedback received from the peer reviews should be addressed to make the tool useful. This could be in the form of reading what other team mates comment or from meeting the supervisor to comment on the grade.

• It has allowed discussions between members to ensure those who are underperforming work harder

• It makes people accountable for the work they have done

• It is useful to tell you what the rest of the team think of your contribution or your role in the project

• When a team is divided into sub-teams, some members will be more informed of the work one are doing than others

• For our team, the peer assessment was a formality, as issues related to performance were discussed within the team. For other teams, it seemed that the peer review often came as a shock to team members who got low reviews, and in the short term ended up creating tension in the team
2. Effectiveness in Formative Assessment

Supervisors

When did they check the peer assessment results?

- I haven't yet: 0%
- Before the interviews: 75%
- As soon as they were sent: 25%

Did the peer assessments identify any underperforming members, either in some areas, or in an overall sense?
- Yes: 100%
- No: 0%
- N/A: 0%

If underperforming students were identified by the peer assessment grades, did you take action to correct team dynamics?
- Yes: 100%
- No: 0%
- N/A: 0%

Will Newton and Eral Bele
2. Effectiveness in Formative Assessment

Supervisor Comments:

• One student was correctly identified as not sufficiently contributing in the first peer assessment, which was obvious to everyone anyways. I think it helped to spurn him on, but had a negative effect on team dynamics.

• I was aware of a situation with an underperforming student before the peer assessment, but it certainly helped the student become aware of the issue.
3. Effectiveness in Summative Assessment

Supervisors

1. How much did the peer assessment results influence your assessments in interim interviews?
   • Evenly distributed responses, from “Not at all (1)” to “Moderately (4)”

2. But: Do you plan to use the peer assessment results to help you decide the final weighting factors?
   • 75% “Yes”; 25% “No”

Student Comments:
• The peer review definitely does contribute to the responsibility and accountability of the team members and I believe should have a bigger weightage in the marks distribution

 Supervisor Comments:
• It helps me understand the team dynamics more clearly, it’s generally a good indicator of student contribution
What Have We Learned?

1. Student comments have been specific, constructive, and truthful. Privacy to supervisors has not made them more truthful, so there is no reason not to share them with the students.

2. It’s clear that the perceived value for students is formative assessment, and for supervisors it is summative assessment – nothing wrong with this.

3. Representation of results and fairness of assessment must be improved:
   - Student training on best practices at the outset.
   - Clarification of calculation procedures. Engineering students are suspicious of anything that is not transparent.
   - Dispelling of myths about some students “playing the system.”

4. Non-moderated connection to grade or a portion of it?
9. Case study: What are the typical marks given by students to peers?
## Case studies analysed

<table>
<thead>
<tr>
<th>#</th>
<th>Lead</th>
<th>Department</th>
<th>N stud</th>
<th>Group size</th>
<th>Year</th>
<th>N weeks</th>
<th>IPAC method</th>
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<td>Pilar Garcia Souto</td>
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<td>CEGE</td>
<td>80</td>
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<td>79</td>
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<tr>
<td>5</td>
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<td>6</td>
<td>Kate Roach</td>
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<td>714</td>
<td></td>
<td>1</td>
<td>5</td>
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<td>Biochemical Eng</td>
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<td>UCL Culture</td>
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<td>Economics</td>
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<td>2</td>
<td>1</td>
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</table>
Typical IPAC values obtained by students

- **IPAC values when given as normalized values**
  - Mean = 1.00
  - Std. Dev. = 0.092
  - N = 476

- **IPAC values when given as percentage**
  - Mean = 94.52
  - Std. Dev. = 10.197
  - N = 710
Typical IPAC values obtained by students

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Normalized</th>
<th>Out of 100%</th>
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<tr>
<td>98</td>
<td>1.19</td>
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</tr>
</tbody>
</table>

Pilar Garcia Souto
Effect of class size

No statistical difference at $p = 0.01$

- Small class
  - $N = 76$
  - $N_{stu} < 40$

- Medium class
  - $N = 400$
  - $40 < N_{stu} < 100$
Staff marks moderation

Types of moderation

- No moderation
- Moderation 1 (shallower)

Moderation 2 (only extremes)

Moderation 3 (capping extremes)

Moderation 4 (stages)
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Credits

Pilar Garcia Souto – Medical Physics and Biomed Eng Dept
Ryan Grammenos – Electronic and Electrical Eng Dept
Cicely Striolo – Chemical Eng Dept
Mira Vogel – LTMS Digital Education
Cloda Jenkins - Economics Dept
Will Newton – Mechanical Eng Dept
Eral Bele – Mechanical Eng Dept
Do you want to know more?

Interested on the outcomes?
Be involved with this research and consortium?
Test method and tool?

E-mail Pilar Garcia Souto
p.garciasouto@ucl.ac.uk
ROUND TABLE

Feedback / questions from participants?

• Priority areas for further work in the IPAC Consortium?

• Priority requirements for the IPAC tool?

• What training can we to provide to students?

• Would you use IPAC in your activities? How?