

Making research-based education more successful: Improving critical thinking and engagement through well-directed peer assessment

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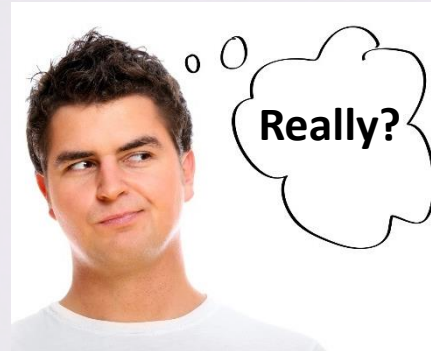
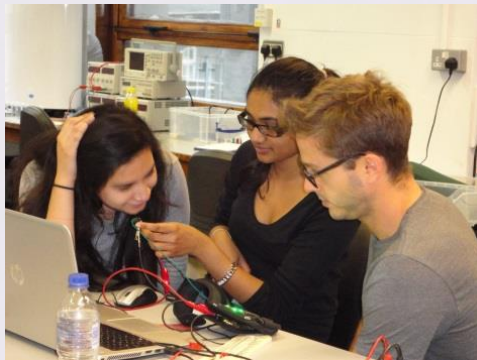
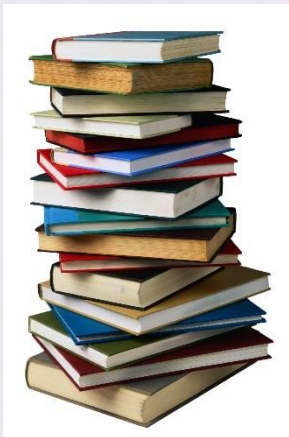
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What does HE aim to provide?

- Deep knowledge on specific field of study
- Practical skills
- Critical thinking
- Workplace professional skills, e.g. teamwork



How can we deliver this?

➤ Research based education (RBE)

➤ Why?

- Covers the 4 aptitudes we are trying to teach
- Engage students, real projects.

➤ Types?

- Project-based and problem-based exercises of different lengths, intensive vs. distributed, etc.
- In many cases, students work in groups
 - Disciplinary and interdisciplinary teams

Possible issues with RBE and group work

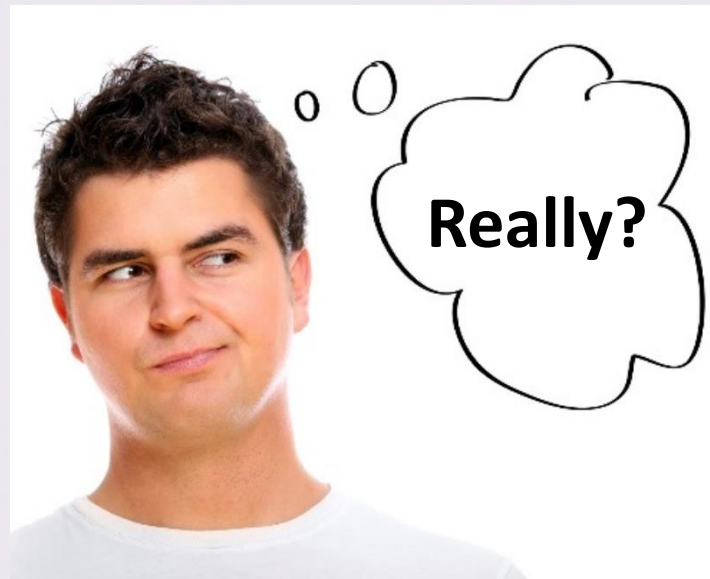
- Well-accepted educational benefits ...

- ... but issues can detract from student experience:
 - Critical thinking skills are needed but difficult to obtain
 - Dissatisfaction with the assessment of group work

- Our work aims to overcome these two issues

(Issue 1) Critical thinking skills are needed but difficult to obtain

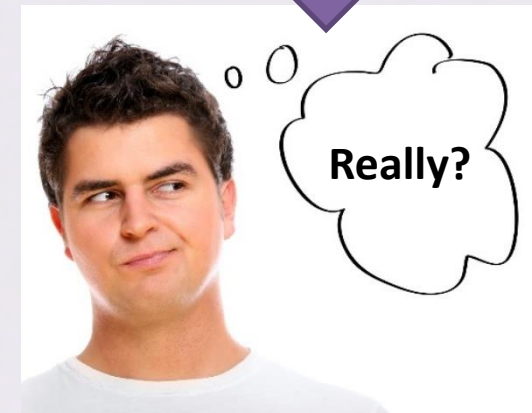
- Acquiring critical thinking is challenging and requires practice
- Long-term approaches are needed.



(Issue 1) Critical thinking skills are needed but difficult to obtain

➤ How we implemented it?

- Critical analysis of someone else's work from early on (peer assessment)
 - Students review and constructively criticize peers' work.
 - Harder than completing the assignment itself → deeper understanding
 - Benchmarking own work
 - Applicable to a range of assignments
 - Quick feedback even in large classes



... but traditional PA has problems

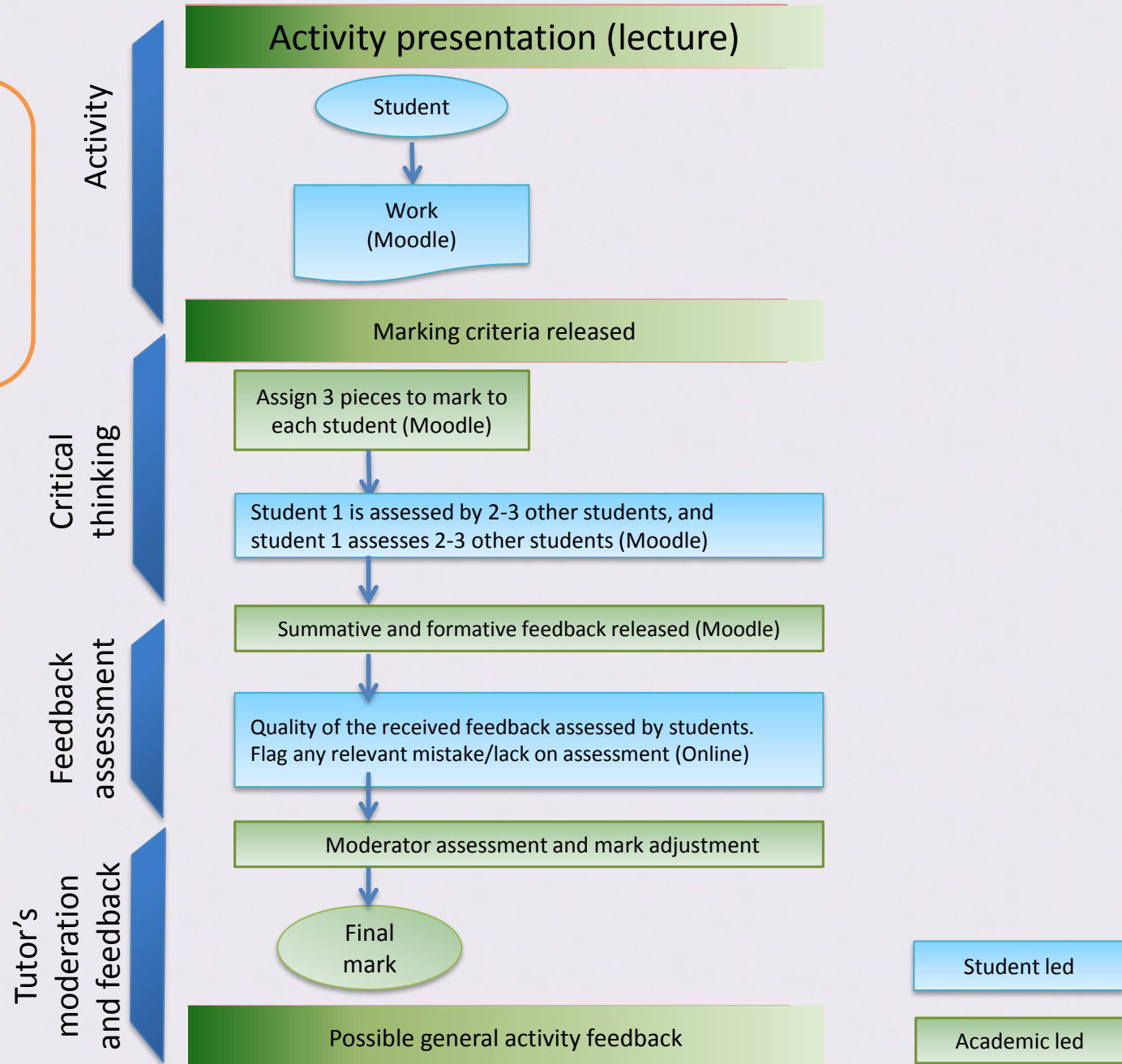
- Student disengagement → poor feedback to peers
- Students lack confidence in their peers' marking skills → students do not trust marks obtained.

360 degrees peer assessment

- Students are assessed on:
product + quality of feedback
- Increase engagement → increase
quality of the feedback
- Students read feedback
- Moderation process is embedded -
→ better student perception of
mark fairness



360° peer assessment method



360PA - performance

- Range of 360PA activities incorporated within the BEng and MEng Biomedical Eng Programme

- Performance assessed:
 - Students' perceptions
 - Staff perceptions
 - Quality of the feedback as assessed by peers

360PA – student perception

- Like tutor moderation
- Useful feedback
- Time consuming
- *“Peer assessment helped me learn how to critically analyse someone else's work and ensure I give good feedback, as well at utilising the feedback I was given.”*
- *“PA activities have improved my ability to construct feedback [...]”*

360PA – student perception

- Negative student perception but academically positive
- “Did *not always* find it *easy to mark peers* as everybody does it differently so there was some *difficulty understanding* how the student got their answer.”
- “Would *prefer own freedom of choice to look at feedback*, rather than being made to for their coursework mark.”

360PA – staff perception

- “I think the 360PA was a *good incentive* for students to focus on trying to provide good quality feedback.”
- “The *effort* expended by the majority of students on the feedback was impressive, and *quality* of the written feedback itself was *generally very good*”.

360PA – Quality of feedback

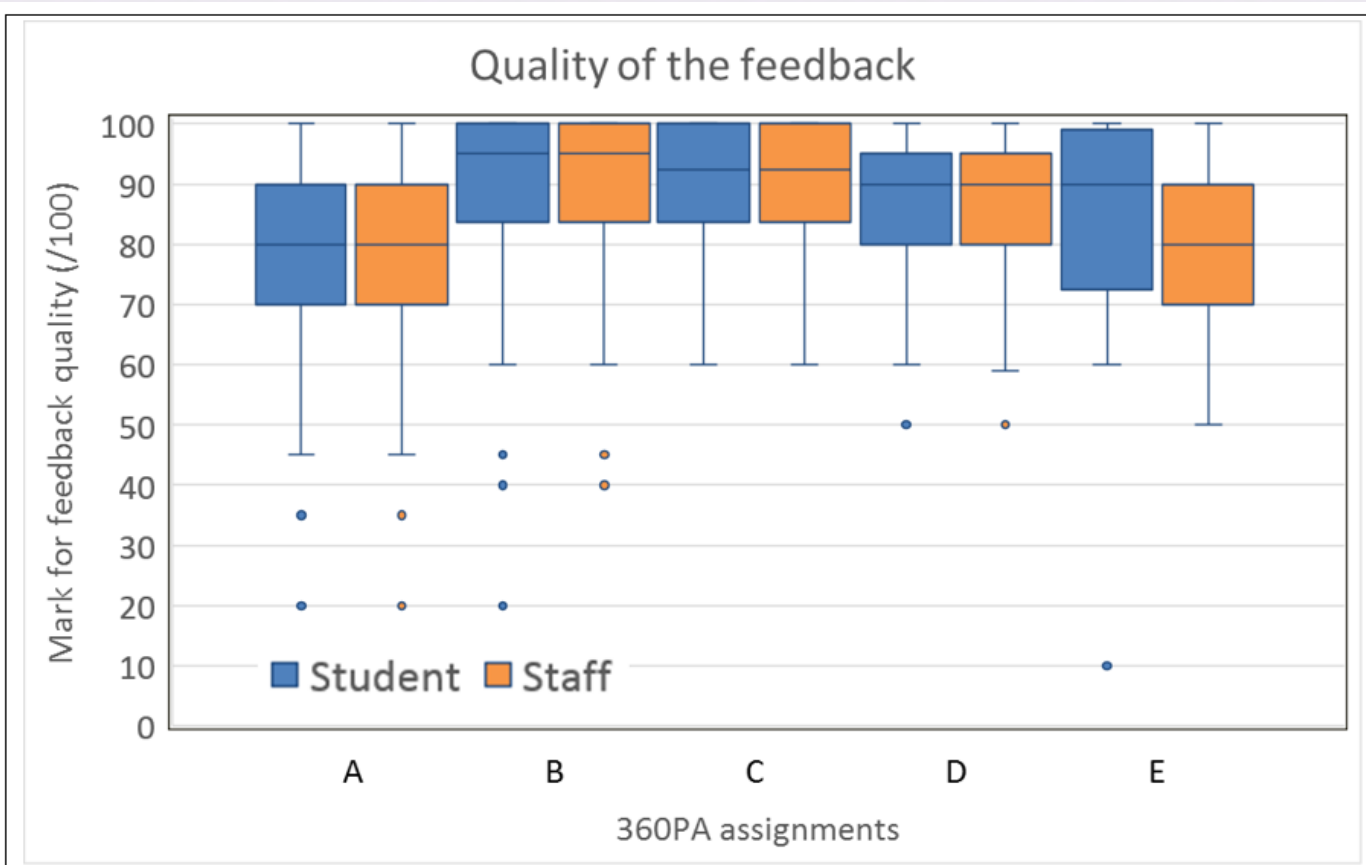


Fig. 1. Peer feedback as assessed by students and after partial moderation by staff. $N_{A-C} = 23$, $N_{D-E} = 33$

(Issue 2) Dissatisfaction with the assessment of group work

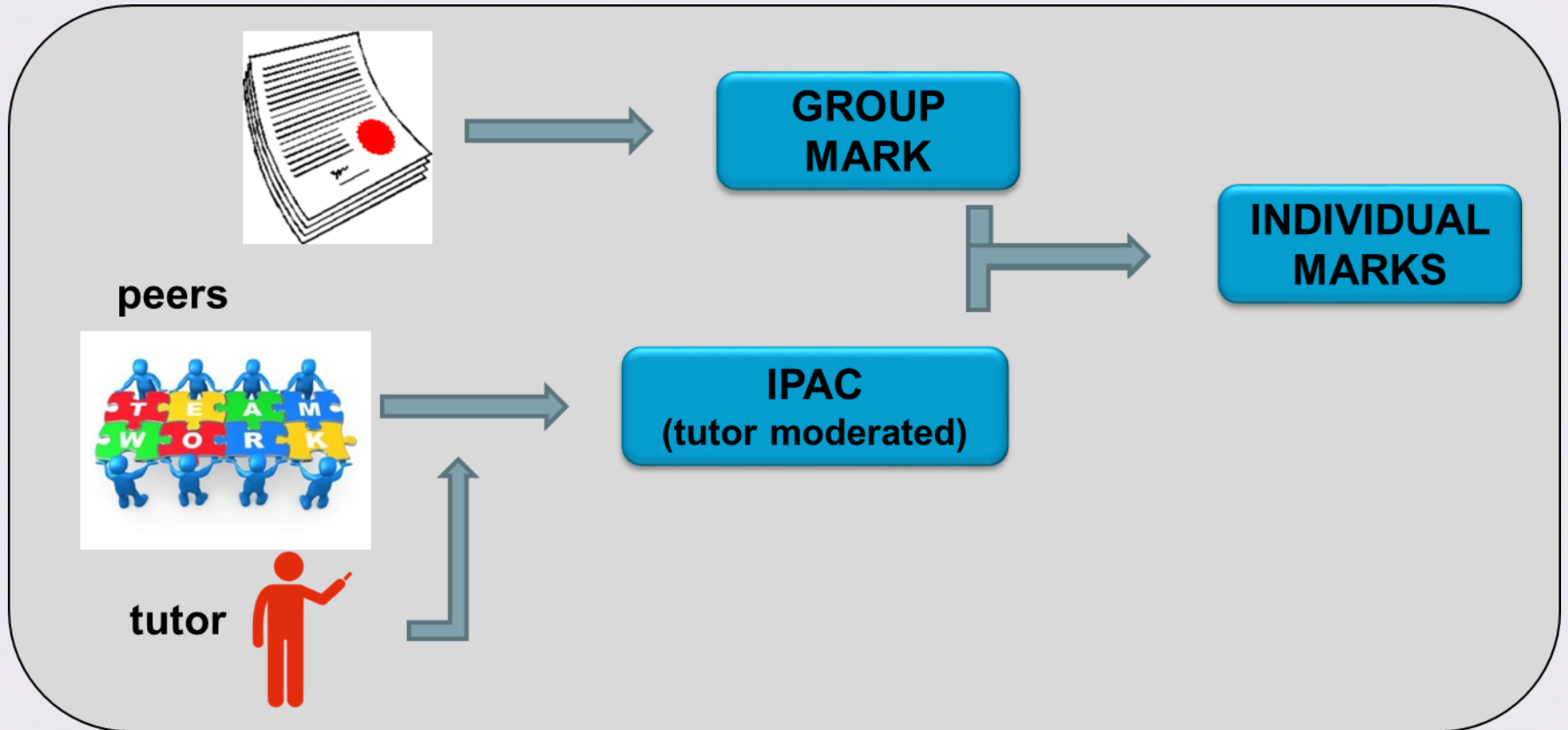
- Staff and students are concerned about the fairness of group assessment as this can damage student experience
 - Dysfunctional behaviour and uneven participation
 - Frustration of high"er"-performing students
 - Reflected into the NSS comments 2016 (might increase as group work increases)
 - Individual mark needed vs a group mark
 - Students can judge contribution better



(Issue 2) Dissatisfaction with the assessment of group work

- Individual Peer Assessed Contribution to group work (IPAC)
 - Include IPAC factor in group work → 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 Consortium:
 - About 40 staff members from 24 departments who are either contributing to the consortium or interested in using the outcomes.
 - Various students from 3 departments.
 - AIM: *“Identify a method for peer assessment of individual contribution in group work, develop or obtain an appropriate tool to implement it, and disseminate [...], make the practice successful and efficient.”*

Individual Peer Assessed Contribution to group work



- Peer and self assessment according to various dimensions (includes self reflection)
- How is personal contribution perceived?
- Practice to give meaningful and tactful feedback.
- All get the same IPAC factor if equally contributed.

IPAC – work so far

- Mapping the use of group work across UCL.
- Collecting student and staff opinions about the current group assessment method.
- Reviewing literature
- Identifying key elements associated with using IPAC
- Review platforms and develop a suitable tool.
- Running trials
- Support UCL practitioners (preparing for Sep 2017)

IPAC - Staff perception

- Staff who implement IPAC see advantages:
 - Fewer complaints about group dynamics.
 - Higher student satisfaction from giving students control over their marks.
 - Tutor moderation keeps the system robust.

- Only major drawback: current e-learning tools are inadequate.
 - IPAC Consortium has addressed this issue!

IPAC – student perception

➤ From student's anonymous questionnaires (N=64)

Students welcome the opportunity to get individual marks for the group work in which they participate.

- Mark would be fairer (78%)
- Individual performance is better known to students (92%)
- Would write the comments in a professional and constructive manner (91%)
- Valuable to know how own contribution is perceived (94%).
- Use feedback to improve performance and teamwork skills in future (87%).
- This type of assessment would motivate or encourage them to:
 - contribute more to the group project (72%)
 - behave in a more professional and respectful way within the team (73%).
- Justification is required (92%), feedback should be anonymous (76%), and given back to the students (79%).

Conclusion

➤ Research based education is recommended

- It helps students to gain
 - Deep knowledge on specific field of study
 - Practical skills
 - Critical thinking
 - Workplace professional skills, e.g. teamwork
- Engage students
- Give students the experience of real projects.

➤ Related issues can be mitigated

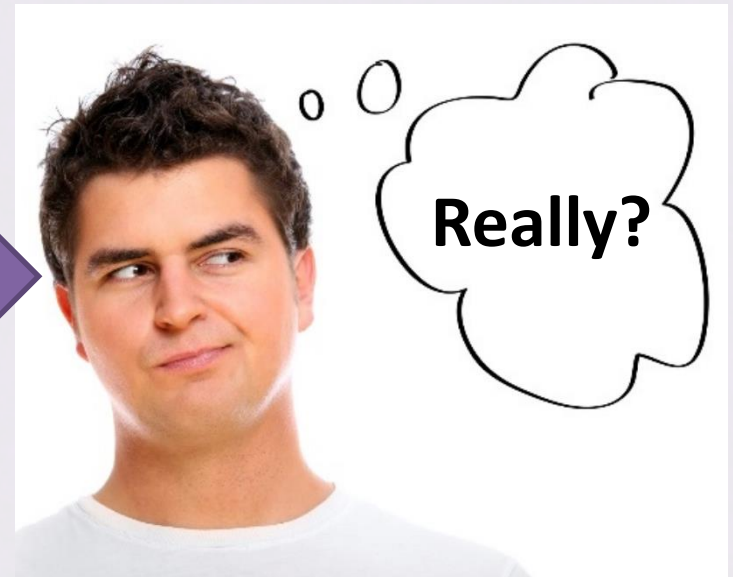
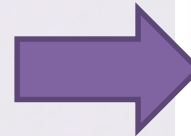
(Issue 1) Critical thinking skills are needed but difficult to obtain

➤ Conclusion:

- Use of PA from start of the programme helps students to develop critical thinking
- Use 360PA to increase engagement and feedback quality



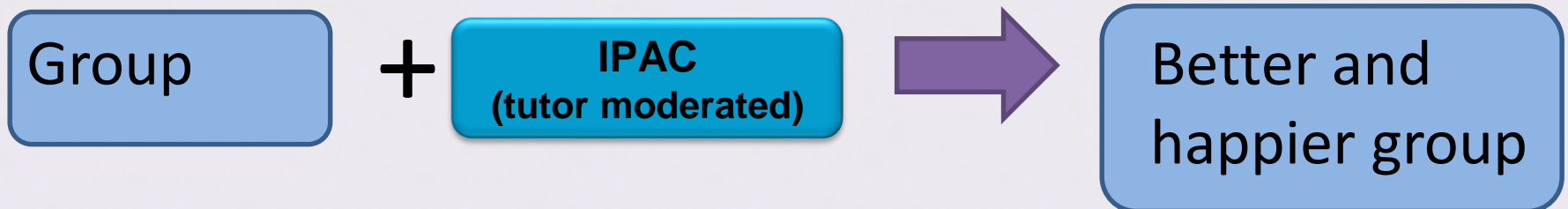
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(Issue 2) Dissatisfaction with the assessment of group work

➤ Conclusion:

- Group work allows for bigger projects and gives relevant experience to students
- Individual marks based on student's contribution should be awarded
- IPAC seems to be a suitable solution



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- Our thanks to staff and student collaborators
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Do you want to know more?

➤ Contact us:

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Thanks