How to make the most of individual and teamwork Peer-Assessment

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Individual PA

When a student reviews a piece of work by another student

Aims

To make students work **during** the semester
To make students realise how much they **really** understand
To make students use the **marking scheme actively**
To provide **more feedback**, in a **timely** manner
To give **me** an idea of students' engagement and understanding

Context

Scottish University, Chemical Engineering Course

- 1st year Course: Basic Principles in Chemical Engineering (120+ students)
- 2nd year Course: Statistics for Chemical Engineers (150+ students)

Both courses delivered "traditionally": lectures and tutorials

What

- 10 **Weekly** homeworks
- Each homework: 1% of final course mark
- Each homework: reviewed/marked by 3 students
- Each student receives two grades per homework:
  - **Submission grade**: how was the student's homework rated
  - **Assessment grade**: how well did the student rate
  - grade split: 80:20

Support given

To do the homework:
- Enough time to submit homework
- Contact time through Tutorial time

To review the homework:
- Detailed worked solutions
- Marking guidelines (0-5 marks): detailed but straightforward to use

How

Online Moodle submission ("**Workshop**" tool activity – see refs 5, 6)

Workshop grades report

First name / Surname	Submission / Last modified	Grades received	Grade for submission (of 80)	Grades given	Grade for reviewing (of 20)
[redacted]	Tutorial 13 modified on Wednesday, 8 February 2017, 11:16 PM	68 (19)< [redacted]	75	- (-)> [redacted]	-
		80 (19)< [redacted]		- (-)> [redacted]	
		76 (20)< [redacted]		- (-)> [redacted]	
[redacted]	No submission found for this user	-	-	-	-
[redacted]	HA CP101 Tutorial 13 modified on Wednesday, 8 February 2017, 11:23 PM	72 (20)< [redacted]	72	80 (20)> [redacted]	20
		72 (20)< [redacted]		0 (20)> [redacted]	
		72 (19)< [redacted]		80 (19)> [redacted]	

Anonymous process (for the students, not for me)
Reviewers can also write feedback **comments**

Students' workload:
every week 1 homework is due and 3 reviews are due

Timeline:
1. homework questions are released several days before tutorial
2. 2 hours of tutorial (ratio tutors:students = 1:20)
3. after 1 week: Homework submission deadline & review process starts
4. after 1 week: review closes and marks are released

Good

- Submission/Reviewing rate: 90-95 %
- Good tutorial attendance
- Improved Engagement during lectures
- Some useful feedback comments
- Well-know benefits to the students' learning
- Other skills learned: students know how to manage deadlines

Not so good

- Quality/reliability of marking
- Submission issues: zero tolerance on missed deadlines?
- Questions about marks received
- A few students are sceptical
- Effect on achievement: small improvement on exam results but not statistically significant

References:
1. Paul Black & Dylan Wiliam (1998) Assessment and Classroom Learning, Assessment in Education: Principles, Policy & Practice, 5:1, 7-74, http://dx.doi.org/10.1080/0969595980050102
2. Moore, C. & Teather, S. (2013). Engaging students in peer review: Feedback as learning. In Special issue: Teaching and learning in higher education: Western Australia's TL Forum. *Issues in Educational Research*, 23(2), 196-211. http://www.iier.org.au/iier23/moore.html
3. Strang K.D. (2013). Exploring summative peer assessment during a hybrid undergraduate supply chain course using Moodle. In H. Carter, M. Gosper and J. Hedberg (Eds.), *Electric Dreams. Proceedings ascilite 2013 Sydney*. (pp.840-853) http://www.ascilite.org/conferences/sydney13/program/papers/Strang.pdf
4. Michael John Wilson, Ming Ming Diao & Leon Huang (2015) 'I'm not here to learn how to mark someone else's stuff': an investigation of an online peer-to-peer review workshop tool, Assessment & Evaluation in Higher Education, 40:1, 15-32, DOI: 10.1080/02602938.2014.881980 http://dx.doi.org/10.1080/02602938.2014.881980
5. https://medschool.vanderbilt.edu/ume/files/ume/public_files/PeerAssessmentsinVSTARLearn.pdf
6. https://docs.moodle.org/32/en/Using_Workshop

Teamwork PA

When a student assesses group members on teamwork performance

Aims

- Promote and reward teamwork
- Differentiate individual performances in a lab group
- Ensure student experience is improved or at least maintained
- Prevent and penalize "social loafing"

Context

- 3rd year Chemical engineering laboratory class: 130-150 students
- 2015/16 academic year: + 700 individual reports marked!
  - Massive marking burden
  - Very difficult to ensure consistency

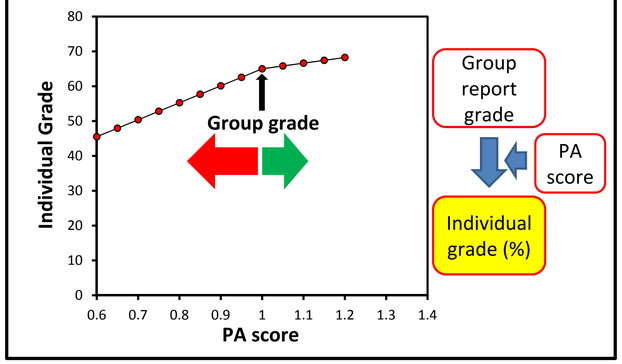
  Need for change!

  → 2016/17 academic year onwards: switch to group reports
- **But what about grades? Group or individual?**

  → Decision to use a PA system to calculate individual grades based on group report marks and PA scores

What

- Bespoke system developed in-house (similarities with WebPA)
- System algorithm can be tweaked for specific purposes



How

- Criteria and scoring guidelines

	0 Absent	1 Very poor	2 Poor	3 Okay	4 Good	5 Excellent
TIME MANAGEMENT (attendance of group meetings, meeting agreed deadlines)						
WORK RATE (contributed time, worked without prodding, calculations and data processing, amount of writing)						
QUALITY OF THE WORK (Developed key parts of report, reliable quality)						
COOPERATION (offered constructive criticism, behaved cooperatively and respectfully to others, assumed leadership role)						

- Example PA form: data received from students

Experiment: T1
Your name: Herbert Chapman
Group: 1

Use the rubric table below (based on 4 main assessment criteria) to give peer/self assessment scores to group colleagues and yourself.
Please be fair, inconsistencies will be checked. The information provided by you will be treated confidentially.

Peer and self assessment rubric	Chapman, Herbert	Ferguson, Alexander	Neid, Silvia	Stein, John
TIME MANAGEMENT (0-5 marks) (attendance of group meeting, meeting agreed deadlines)	4	3	5	4
WORK RATE (0-5 marks) (Contributed time, worked without prodding, calculations and data processing, amount of writing)	5	4	5	4
QUALITY OF THE WORK (0-5 marks) (Developed key parts of the report, reliable quality)	4	4	4	4
COOPERATION (0-5 marks) (Offered constructive criticism, behaved cooperatively and respectfully to others, assumed leadership role)	5	4	5	4
TOTAL SCORE ATTRIBUTED (SUM):	18	15	19	16
Marking notes: No contribution --> 0; Very Poor -->1; Poor --> 2; Aceptable --> 3; Good --> 4; Excellent --> 5; NOTE: IF you give a score EQUAL or LOWER than 3 to a colleage, you MUST write a comment to justify your decision.	Comments			
		Fergie worked well but struggled to meet some of the agreed interim deadlines.		

- PA rules are explained to students in an induction lecture
- PA form contains detailed instructions
- Non-submission of PA form carries an automatic penalty

Good

- System helped reducing report marking to less third of the initial burden without affecting the learning outcomes
- Students became quickly familiarized with new PA system
- Students score the PA system much higher in terms of "fairness" when compared with flat group marks

Not so good

- System not automated: relies on manual transfer of data
- Higher administrative burden for class coordinator
- Can be difficult to manage when dealing with groups with poor group dynamics

References:
1. M.M. Ashenafi (2017), Peer-assessment in higher education–twenty-first century practices, challenges and the way forward, Assessment & Evaluation in Higher Education 42:2, 226–251, https://doi.org/10.1080/02602938.2015.1100711
2. Leung at al. (2017), New assessment process in an introductory undergraduate physics laboratory: an exploration on collaborative learning, Assessment & Evaluation in Higher Education, 42:2, 169-181, https://doi.org/10.1080/02602938.2015.1089977
3. WebPA website: http://webpa.ac.uk/