Towards a competency-based peer assessment for engineering group projects using skill descriptors

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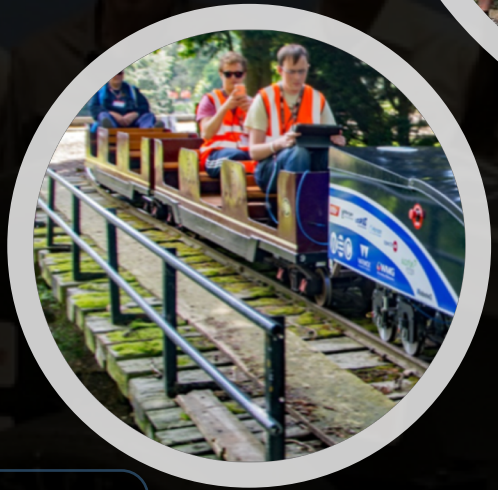
Introduction

- Assessed group work is a prevalent feature of undergraduate Engineering courses (required by AHEP 3)
- Group work nurtures skills that are valued by employers including oral communication, negotiation, and other interpersonal skills (Chin, 2010).
- Tested at assessment centres using: competency-based interviews, group exercises and role-play scenarios



Year 1
3 short projects worth
10% of year

→

Year 4
1 large project worth
25% of year

Previous System

Team score for deliverables x peer score = individual score

Potential issues:

- Students more concerned with their mark rather than the outcome of the project
- Unclear criteria for success
- Game playing and collusion
- Diversity of the student population

Competency-based recruitment and performance management

Jaguar Land Rover
Business Behaviours:

- My Business
- Effective Relationships
- Strong Teams
- Efficient Delivery
- Agility and Flexibility
- Positive Impact
- Clear Direction
- High performance

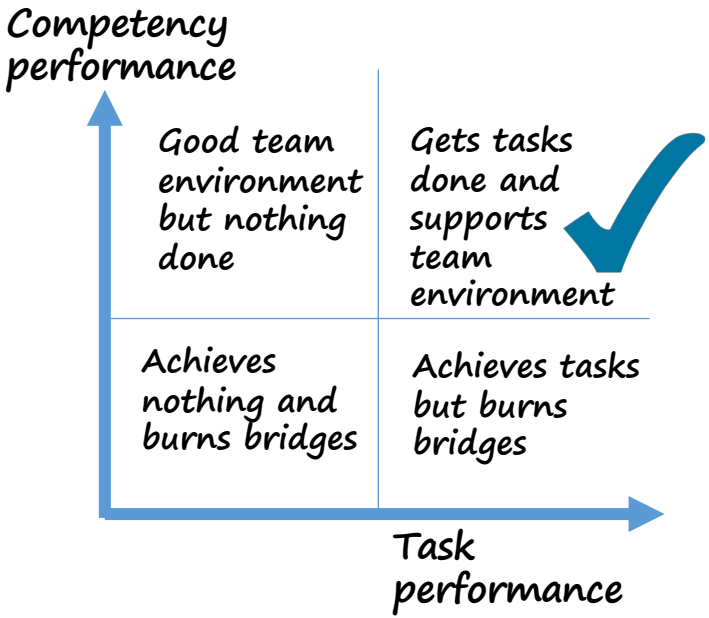
BAE Systems:

Continuously Improving

- Seeks and accepts feedback from others
- Can take a step back
- Considers how solutions / processes can be improved

Working Together

- Is willing to co-operate to achieve objectives
- Encourages others to become involved
- Actively seeks to understand others' point of view



https://www.baesystems.com/en-uk/careers/careers-in-the-uk/your-career-with-us/search---apply/graduate-opportunities/applications/application-hints-and-tips

Aims & Rationale

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Explicit	Consistent	Fair	Feed-forward
clearly defined criteria for successful team work	all marked against the same descriptors	clear and transparent opportunity to gain marks	Grow skills and improve performance at graduate assessment centre

Identification of skill descriptors

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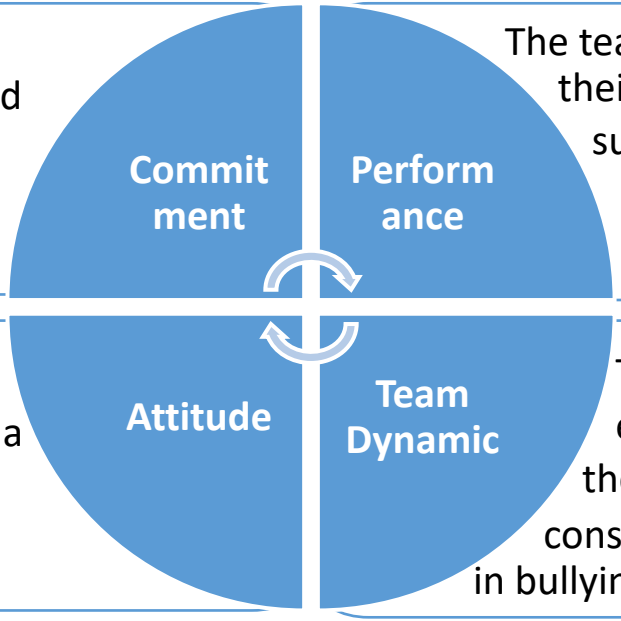
The team member attended meetings, provided ideas and was generally available as needed.

The team member contributed their agreed role and to the success of the project as a whole.



The team member was positive, honest and played a constructive role to identify and address challenges.

The team member encouraged others, helped the group to reach consensus and did not engage in bullying or discrimination.

Marking of skill descriptors

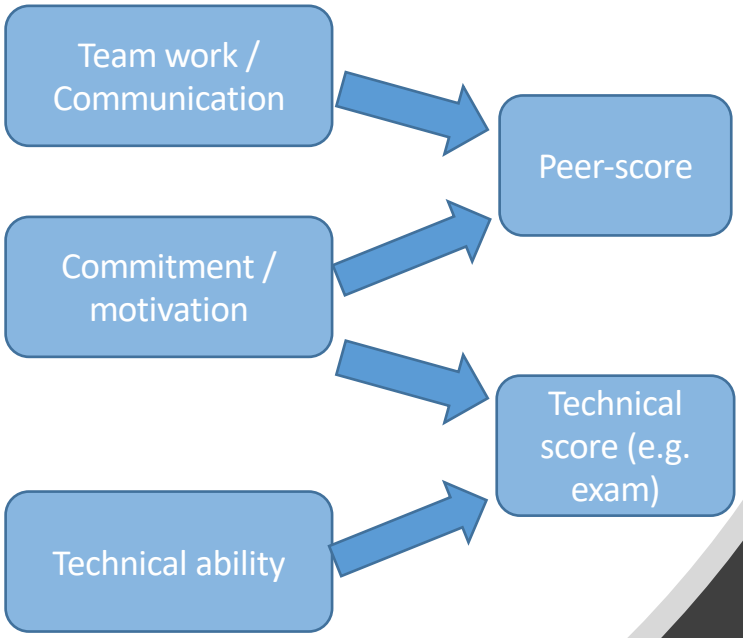
Mapping to classification gives clear guidance for level of success

Key skill	Fail	2:2	2:1	1st
Commitment	Did not attend meetings and had no valid excuse	Attended meetings but was ill prepared and/or late	Well prepared for meetings, arrived on time and fully participated	Well prepared for meetings, arrived on time and encouraged others to participate
Performance	Does not contribute or perform well in the project	Is a good performer with effort varying throughout the project	Makes a sustained effort performing highly throughout the project	Holds others accountable and makes a huge effort with high performance throughout
Attitude	Did not contribute positively to challenges perhaps giving up	Morale affected by challenge but willing to persevere	Responded positively to challenge, accepting new direction	Aided discussion on overcoming challenges
Team Dynamics:	Is not transparent or willing about issues affecting the team and/or avoids or actively seeks conflict	Is not always forthcoming when discussing issues affecting the team and/or finds it difficult to negotiate	Is willing, fair and transparent when engaging with and negotiating team issues	Is skilled at identifying and bringing issues to discussion, negotiating and incorporating others' viewpoints

Emergent Findings 1

- Pilot using a one-week project (part of a module taken by all first-year engineering students)
- Run during and after project
- Compared against previous system using student survey
- Feedback from students:
  - Like that the earlier assessment gave them (or others) a chance to improve
  - Like that the system captures more than just contribution
  - Would like more granularity in each rating

Emergent Findings 2



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- We compared individual student scores to their performance on other modules.
- The previous peer assessment system tends to result in higher comparative scores for lower-performing students and vice-versa.
- The piloted peer assessment system produces scores that are more reflective of the other assessments. This suggests that the proposed system more accurately and fairly reflects students' contributions.

Conclusions & Further Work

- Initial feedback is positive; students have a clear idea of what they need to do and how to mark each other consistently
- Planned full trial of the proposed system (July 2019) to confirm whether:
  - Feedforward – do team work skills improve (year 1 to year 2 trial)?
  - Fairness - does normalising with the median rather than the mean improve perceived fairness and consistency between projects?
  - Evaluation – how can we best evaluate a peer review system?
- Longer term: gather data on students' perceptions of whether the peer assessment feedback has a positive effect on their teamwork skills and their assessment centre performance.

Questions?

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