**Developing as a Student Peer Reviewer: Enhancing students' graduate attributes of producing evaluative judgements and oral feedback communication**

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**Abstract:**
This research paper explores the processes and outcomes of a peer review system which was introduced to 74 first-year students on a BA Education programme in 2016-17. In this one-year action research study, students completed a series of tasks linked to both their academic work and professional teaching placements. The scaffolded nature of these tasks aimed to develop the students' skills, knowledge and confidence as novice peer reviewers. The students' task responses, written reflections of the peer review process and interviews were analysed, to explore the potential value of producing and giving formative feedback to peers.

The sustainability of peer review was considered when peer review moved into the students' professional context. This considered how becoming peer reviewers helped students to develop two graduate attributes - forming evaluative judgements based on an understanding of quality and being able to communicate feedback orally - and the influence of these qualities on students' development of self-regulation. The students' challenges in engaging in the peer review process were also considered.

**Keywords:**
Peer review; graduate attributes; evaluative judgements; oral feedback communication; sustainability.

**Introduction:**
Graduate attributes are the skills and qualities that Higher Education Institutions (HEIs) believe students should gain by engaging in academic study and student life. These are viewed as skills that can then be transferred into life-long learning experiences, beyond university. Although the desirable graduate attributes vary according to degree course and university - with some examples being innovators, global citizens, communicators and critical thinkers - the cognitive demands required to develop these qualities may differ to those for subject-specific learning outcomes of degree modules. Therefore, this study aimed to explore how a degree programme might support students in developing some of these life-long learning qualities.

Against the backdrop of students' feedback dissatisfaction in Higher Education, relative to other course components (HEFCE, 2016), an action research project was undertaken in 2016-17 involving 3 university tutors (also the research team) and 74 first-year students on a BA Primary Education university course (which incorporates Initial Teacher Education). The project originated following the tutors' discussion of ways to increase student engagement in the university's feedback systems. The initial aim was for the students to develop the skill of producing evaluative judgements about their peers' academic work and aspects of teaching practice during their first professional teaching placement. The intended outcomes were that students would become more knowledgeable of the

feedback process by developing an understanding of quality, and increase their confidence as communicators.

This paper will present and discuss the findings from the project, with a particular focus on the developments of 6 students who were studied in depth to gain an insight into the students' perspective and indications of sustainability, as well as the analysis of whole-cohort data. The sequence of the peer review tasks will also be explained, as the design aimed for first-year students to develop their skills, knowledge and confidence to become successful peer reviewers. To strengthen the validity of the project, a detailed literature review was undertaken, with a summary of key points below.

**Literature Summary**

Higher Education (HE) degree courses aim for students to transform their ways of thinking (Bryson, 2014). Key to this transformation, students are expected to develop graduate attributes, such as becoming critical thinkers and autonomous learners (Boud, 2014). For students to succeed beyond university, they need to sustain and regulate their learning, and graduate attributes should play a key role in achieving this (Boud, 2014). As life-long learning is a goal stated by HEIs globally (Kreber, 2014), the increased focus of literature and research in this area (Boud and Soler, 2016) seems sensible, with self-regulated individuals being likely to benefit future workplaces and society.

Nicol (2010) proposes that some graduate attributes may be developed if students become skilled at producing evaluative judgements of their own – and peers' – work. Others agree (Sadler, 2010), indicating that success will depend upon making such evaluative judgement skills explicit (Boud, 2014), and accessible to engage increasingly diverse groups of learners (Bryson, 2014). Therefore, the focus in HEIs on student-centred feedback approaches, such as peer review, is timely. Defined as peers reviewing and giving feedback of work produced in the same domain (Nicol, 2014), research into the use of peer review in Higher Education (which will be discussed later) is experiencing an interesting change in emphasis, from students receiving reviews to students becoming peer reviewers.

Sadler (1998; 2010) considers producing reviews of peers' work potentially strengthens students' evaluative judgement capacities through increased critical reflexivity – namely, developing more objective thinking by understanding and attempting to view others' perspectives (Bolton 2010). Cho and MacArthur's (2011) randomised-controlled trial demonstrated that producing reviews of peers' work improved the reviewers' subsequent performances in their own (similar) tasks. This study also suggested reflexive gains, indicated by interviewed students who said that judging three pieces of work of varying quality enabled them to evaluate the effectiveness of enacting evaluation criteria in different ways.

Sadler (2010) however warns of HE students – as novice evaluators – having sufficient knowledge to construct evaluative judgements. In support, Cho and Cho's (2011) study of Physics undergraduates identified that the peer reviewer's level of subject knowledge 'significantly influenced' (p.637) problem detection-diagnosis-solution comments when reviewing peers' work. Interestingly in Cho and Cho's peer review design, review recipients gave feedback to reviewers regarding subsequent review usefulness.

Nicol et al. (2014) explored how Engineering students formed their evaluative judgements as peer reviewers. In interviews, students discussed their use of the tutor's evaluation criteria, as well as developing an 'internal standard' (p.114) of quality with reference to their own work.

The peer review process was anonymous in the three studies discussed above, and although the students cited benefits to this including honesty (Cho and MacArthur, 2011), anonymous peer reviewing appears to conflict with peer review studies linked to Initial Teacher Education (ITE) courses. For example, in Sims and Walsh's (2009) two-year case study, student teachers reported that the peer review system used to develop their teaching skills in the classroom was particularly important when lessons failed, transforming negative experiences into positive future actions. Students viewed their (known) peers as supportive problem-solving partners rather than evaluators. Mercer (2013) considers such collaboration to be an opportunity to engage in collective thinking, with students being able to both share ideas but also to constructively negotiate their viewpoints.

Such a transformational shift towards student-centred learning is not without considerable challenge for students, tutors and traditional assessment and feedback practice in HEIs. Torrance's (2007) warning of students' superficial engagement in feedback tasks might be avoided by Biggs and Tang's (2011) suggestion of a 'deep approach' (p.29): developing students' understanding and application of the theory, principles and purpose underpinning the mechanism of peer review. Bryson (2014) takes the challenge of student engagement further in his acknowledgement of greater higher education student diversification – Scott et al. (2014) suggest that tutors, as motivators, use their knowledge of students' needs and attitudes when considering how they will access new approaches. This accords with Boud and Molloy's (2013) advice: balancing student agency with their experience, skills and knowledge when designing student-centred feedback systems.

**Design of the Peer Review Tasks**
The literature review suggested to the tutors on the BA Education course that the design of the peer review tasks for the first-year BA Education students was crucial to students' engagement and success. Therefore, Nicol's (2014) principles for peer review, shown in Figure 1, became an important reference list during the design process.

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'Principle 1: encourage an atmosphere of trust and respect
Principle 2: use a range of different perspectives for the review tasks
Principle 3: give practice in identifying quality and formulating criteria
Principle 4: require well-reasoned written explanations for feedback responses
Principle 5: facilitate dialogue around the peer review process
Principle 6: integrate self-review activities into peer review designs
Principle 7: encourage critical evaluations of received reviews
Principle 8: provide inputs that help reviewers calibrate their judgements'

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**Figure 1.** Guiding principles for peer review (Nicol, 2014, p.209).

In accordance with some of the principles in Figure 1, the tutors prepared a sequence of peer review tasks. These tasks aimed to build up students' peer review skills, their trust in each other and their engagement in the process. After each task, the students wrote reflections about the peer review process, to enable the tutors to analyse their reactions to peer review throughout the year.

The tasks introducing peer review to the students occurred at the beginning of the year. In a taught session, the students were asked to write a poem about becoming a teacher. They then used the tutor's evaluation criteria to review an unknown peer's poem and subsequently received a written review of own poem. Following this, a workshop was held for BA Education tutors and students, to introduce the principles shown in Figure 1. and establish a shared understanding of the aims and processes of peer review.

Three tasks incorporating a peer review opportunity followed. These took place within the students' Primary Science Education module. This module aimed for the students to improve their knowledge of science, alongside effective ways to teach the science curriculum in the primary classroom. For these tasks, the students gave written responses to subject-specific questions provided by the module tutor: 'explain how you can see your breath on a cold day'; 'explain how a candle burns', and 'explain the drop of a hammer and a feather'. They used the tutor's evaluation criteria to: self-review their own work; rank 4 pieces of work and justify their decisions; write a formative review of a peer's work and finally add improvements to their own work. The students submitted their work for the tutor's feedback about the self-review and peer review.

The students then had the opportunity to peer review each other's teaching skills through two micro-teaching tasks. For micro-teaching task 1, they worked in pairs to plan, deliver and evaluate a 10-minute science activity suitable for primary-aged pupils. The students' objective was to ask effective questions to the pupils, during the delivery of their science activities. They worked in their pairs to devise evaluation criteria for effective questioning. The science activities were conducted at an event held in the university for visiting school pupils. One student led the science activity, the other audio-recorded and observed their peer's questioning skills, and then they swapped. After the event, the students formatively reviewed their peers' questioning skills by completing:

- an initial written self-review of their own questioning skills, referring to the audio recording;
- a written review of their peer's questioning skills, referring to the audio-recording;
- a peer-to-peer tutorial to communicate and negotiate feedback;
- amendments to their written self-review following the receipt of their peer's feedback.

Micro-teaching task 2 took place several weeks later in the student's teaching placement school. This was also a 10-minute science activity with a small group of primary-aged pupils, focusing on the students' use of effective questioning. This followed the same peer and self-review process as micro-teaching task 1.

**Methodology**

This research project was a one-year action research study, being small-scale and exploratory, and conducted from an interpretivist researcher position (Bryam, 2012) by three researchers who were also university tutors on the course. Strengths of this study (eg. the validity of the authentic context) and limitations (eg. reliability; potential for researcher bias) (Yin, 2014) were taken into account by the researchers when evaluating data and drawing conclusions.

Ethical procedures were planned and followed throughout the research project, aligning with BERA's (2011) guidance, and in accordance with approval given by the university's ethics committee for the research to be conducted.

*Research Questions*
The research project explored these main questions:

- Can developing as a peer reviewer enhance students' key graduate attributes?
- Peer review as a sustainable feedback mechanism for students: what are the indications and challenges?

*Data Collection*
Stage 1 of Data Collection

Whole student cohort data (n=74) was collected to identify emergent themes of possible graduate attributes that the students were developing as peer reviewers. As these themes were potentially unique to this group of students – and therefore could not be pre-determined - this inductive approach aligned to a synthetic research design (Bryman, 2012; Laurillard, 2012). To find out the students' perceptions of becoming peer reviewers and identify these emergent themes, the whole cohort of students was asked to write reflections after each task, by responding to a series of questions.

Stage 2 of Data Collection
Interviews were conducted with 6 students (referred to as tracked students A-F), to explore further their written reflections from the peer review tasks and the themes that had emerged through data collection at Stage 1. This sample comprised the 6 students who had complete data sets from Stage 1 (ie. had completed all the tasks and associated written reflections about the peer review process). The diverse range of backgrounds and needs within the student group was recognised by treating these 6 students as individual cases, although they were considered broadly representative of the student cohort.

The interviews with the 6 students were audio-recorded and transcribed. Data was coded - initially categorically to enable comparisons to be made to identify similarities and differences in students' developments – followed by analytic coding (Gipps, 2007), as a chronological narrative was explored for each student (Yin, 2014). As new angles for each theme emerged, coding adjustments were made and previous transcripts re-read and re-coded: further demonstrating the iterative research approach.

**Findings and Discussion**
*Stage 1 of Data Collection: Emergent Themes*
Whole student cohort data were collated and analysed to identify emergent themes. This used the students' written reflections about the peer review process for micro-teaching task 1 (61 out of the 74 students completed this, with 18% attrition). At this point the students had completed the three written tasks and micro-teaching task 1. Emergent themes as students developed as peer reviewers were identified and two qualities that could be classed as graduate attributes dominated: producing evaluative judgements and oral communication skills when giving feedback to peers.

61% of the responses to the question: 'How are you developing your peer review skills?' were linked to the graduate attribute of developing evaluative judgement skills. The three main themes of these responses were *understanding quality*, for example:

'This made me think about what was effective – I paid less attention to minor mistakes.'
*understanding evaluation criteria,* for example:
'It allowed me to understand the criteria necessary for judging effective teacher questioning.'
and *using self-reflections to develop peer feedback*, for example:
'I had to reflect on myself in order to give constructive feedback.'

72% of the responses to the question: 'What did you think of the peer-to-peer tutorial?' were linked to the graduate attribute of oral communication skills (in relation to feedback in this context). There were four main themes in these responses: *a greater understanding of feedback through oral communication rather than written*, for example:

'Talking about the feedback meant I could explain the feedback more clearly than in written feedback.'

*feedback as a constructive process,* for example:
> 'It was great being able to talk about examples of ways to improve.'

*feedback as a conversation,* for example:
> 'We had a proper conversation about the feedback. We both asked questions.'

and *the feedback process being supportive*, for example:
> 'This was much more supportive than getting written feedback. We were in it together.'

The whole student cohort was also asked to consider the influence that becoming peer reviewers might have on their own performance, as this could have implications for sustainability. In response to the question: 'Has reviewing your peer's work helped you in any way, or not?', 50% of the responses were linked to self-review, referring to either *the critical evaluation of another's work improving one's own work,* for example:

> 'I looked critically at the way the other person had worked, which helped me be critical about and improve my own.'

or by *considering a peer's approach to a task,* for example:
> 'I'm learning from another's approach.'

17% of the responses gave indications of self-regulation, by either *comparing own work to a peer's,* for example:
> 'It made me compare myself to others – it makes you strive towards their positives.'

or by *developing more objective judgements,* for example:
> 'I think I judged their work in a more realistic way than self-review. Useful to remember as I'm quite self-critical.'

The students were also asked about the challenges they were experiencing as peer reviewers, to explore the potential for sustainability further. In response to the question: 'Did you experience any challenges, or not, when reviewing a peer's work?', three main themes emerged. Firstly, *authority and level of knowledge,* for example:

> 'It would be better if a teacher/tutor did it – they know so much more, and feedback is easier to take from them.'

similarly, *accuracy,* for example:
> 'I'm not sure how accurate my comments were. I don't have a lot of experience myself.'

and *honesty,* for example:
> 'I tried to be honest but there were a couple of things I didn't bring up because I didn't want to offend them.'

*Stage 2 of Data Collection: Tracking 6 Students' Developments in Depth*
Stage 2 of data collection enabled these emergent themes and the research questions to be explored in greater depth with 6 tracked students, through interviews conducted by the researchers, following micro-teaching task 2. At Stage 2, we aimed to identify if the students were beginning to transform by engaging with peer review beyond Torrance's (2007) caution of superficial engagement (completing peer review tasks because they were asked to) or were they maintaining the common view held at the beginning of the year- summed up in Student A's first written reflection about peer review:

> 'Feedback is the tutor's job.'

Evidence from the students' interviews indicated that moving peer review into the context of their future careers – teaching - seemed to be a turning point in their engagement, when they started to invest more deeply.  Student B's interview response was typical of all the tracked students' interviews: 'Peer review has been most valuable in our professional [teaching placement] context.'

As we were considering the sustainability of peer review, this was encouraging and therefore most of the interview questions focused on the students' responses to their micro-teaching tasks.  Aligning with the whole student cohort responses in Stage 1, the interviewed students repeatedly referred to the potential graduate attributes of making evaluative judgements when producing feedback (and using these judgements to improve their own performance), and developing their oral communication skills when giving feedback.

These skills were indicated in Student C's final interview, for example:

> 'Giving feedback can be helpful as it forces you to evaluate your own work.  I am reflecting more deeply about my own work by comparing it to others': spotting my strengths and weaknesses.  We have supported each other constantly, by talking about each other's lessons and making suggestions.'

*Graduate attribute: the skill of producing evaluative judgements*
A comparison of each tracked student's peer review feedback for micro-teaching tasks 1 and 2 indicated that they had developed their evaluative judgement skills.  For example, Student B's comments as a peer reviewer following micro-teaching task 1 were:

> 'Lots of open questions.
> 'They all seemed really engaged.'
> Maybe give a bit more time for response – allow children to explore their thoughts.'

Student B progressed to more qualified reasons following micro-teaching task 2:

> 'Good use of questions to encourage justification from the children, particularly the use of the phrase 'Why do you think…?' so they felt confident to suggest an answer.
> Perhaps use less adult-led discussion when doing activities like this [a science exploration]. Maybe you could encourage them to ask questions instead of you asking lots of closed questions that might guide them to the answer.'

Aligning with Cho and Cho's (2011) research, Student B referred to her knowledge development when interviewed:

> 'I understand more now about what makes a good question, and how we can use questions to help children learn.  That really helped me to give feedback to my peer about her questioning skills.'

There was evidence that some of the students were negotiating evaluative judgements during the peer tutorials, reflected in Student C's comment:

> 'It was a conversation and it was constructive: the chat allowed you to meet in the middle when we disagreed on anything.'

This indicated that the students were developing trust in each other – discussed by Sims and Walsh (2009) - and confidence in their own judgements.  They viewed feedback discussions as collaborative and constructive, suggesting Mercer's (2013) idea of collective thinking.  The peer tutorial was considered essential to negotiating the reviews and engaging in a constructive dialogue, as expressed by Student F:

> 'You can have your own opinions, but if you share these with someone else, you know these have some weight.'

*Graduate attribute: the skill of communicating feedback orally*
The findings above suggest that oral communication of feedback was a crucial part of the success of the peer review process in this study.  The student interviews enabled further exploration of how this method of feedback delivery was generating active involvement by both reviewer and recipient, as well as the view that a feedback experience could be positive and constructive.

When asked, all interviewed students said they preferred giving and receiving oral rather than written feedback (having produced written feedback for the academic tasks):

> 'Giving oral rather than written feedback means it's easier to explain if your peer doesn't understand something.  It becomes a conversation.'                                    (Student F).

Providing oral feedback meant that it could not be anonymous.  Conversely to Cho and MacArthur's (2011) study, some students explained that knowing their peers helped when giving feedback, including Student D:

> 'At the beginning of the year I struggled with giving honest feedback, because of not knowing my peers.  We now know each other well; this helps us to say exactly what we think.'

Studying Student D's peer-to-peer feedback tutorial following micro-teaching task 2 provided further insight into her development of oral feedback skills (Figure 2.):
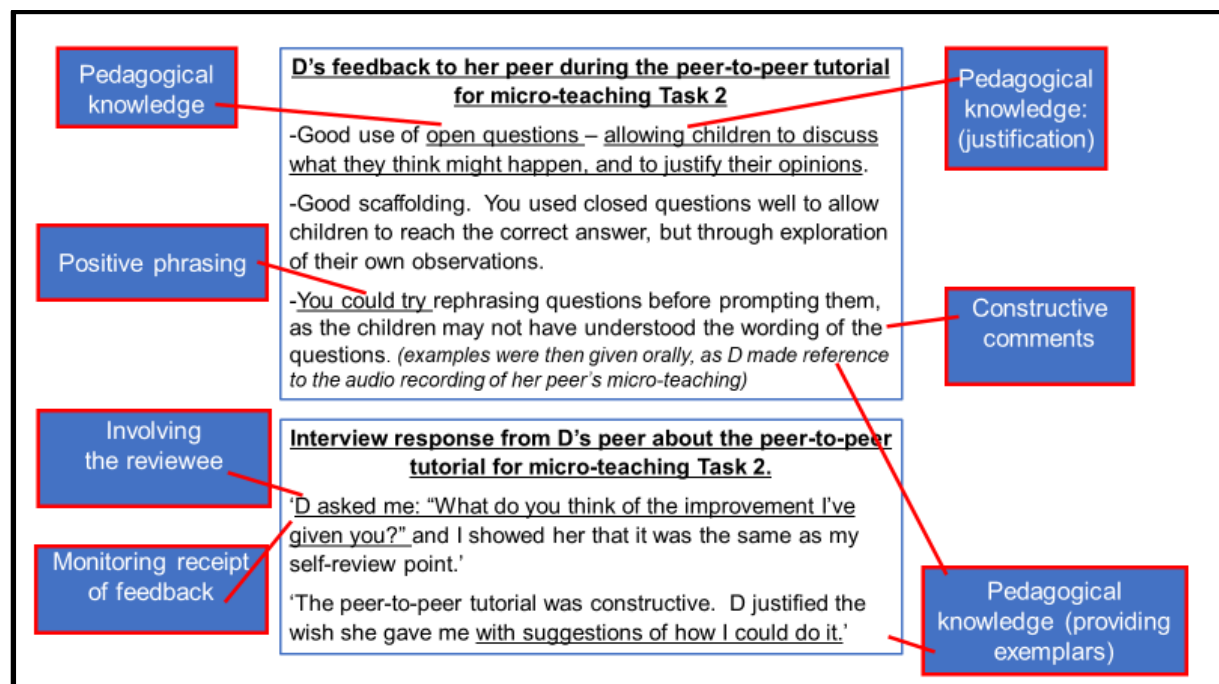
**Figure 2.** Features of effective oral communication of feedback: (source: written records and interview).

However, active involvement of both peers during the feedback tutorials did not mean that they always agreed, as Student A explained:

> 'My peer said I'd used detailed questions to recap the learning, but I thought I gave the pupils a lot of information and then asked them questions with obvious answers, based on what I'd told them. I remember at university doing some reading for English, about dialogic talk.  It said there's too much funnelling by the teacher to an answer.  I told my peer that I didn't agree with her point because of the research I'd read.

> She still thought it was a good thing as she said it provided them with information, so they could answer the questions.  I told her that in my opinion if you give too much information, a child won't understand it, but instead tries to learn it by rote.
> In the end we agreed to disagree.'

*Sustainability: indications and potential barriers*
When evaluating the potential for peer review to be a sustainable process, we investigated whether the students were considering transferring their evaluative judgements to improve their own work, as demonstrated in Cho and MacArthur's (2011) study.  Interview responses offered some insights:

> 'Peer review helped me to think whether the strengths I saw in my peer were missing from my teaching'                                                                                              (Student F).
> 'I knew I needed to improve my use of closed questions but didn't realise how much I needed to improve it until I saw him doing the same thing.  In the peer tutorial, we used examples from each other's micro-teaching to find ways to improve it.  It's hard to judge your own faults: you could think it's fine, but it isn't'                                                                           (Student E).

Scrutiny of the students' written records supported this: the judgements they made of their peers' work were reflected in many of the final self-reviews.

Whilst some students expressed greater confidence and skills as peer reviewers, others raised concern that they still lacked the (pedagogical) knowledge needed to progress a peer further:

> 'I don't know the next step myself as I haven't had a lot of experience, so it's hard to think of a target for my peer.  Then I think: could I do this target myself?'                            (Student F).

When evaluating each other's micro-teaching, it was evident from both the students' written records (ranging from 1 to 6 pages of notes when preparing their peer reviews) and interview comments that this level of autonomy was also a challenge:

> 'It can be hard to know what is important and what isn't.  I wrote everything down and it took ages to turn into proper feedback'                                                                    (Student C).

Although a scaffolded approach to peer review was used, the challenge of balancing student agency and tutor involvement in the process – discussed by Boud and Molloy (2013) - was evident throughout.  When peer review moved into the students' micro-teaching experiences, there was a deliberate absence of tutor input, aiming to allow the students to develop some autonomy.  However, this had

implications for the reliability of the students' judgements. An interesting suggestion to increase the tutor's input without jeopardising the integrity of peer review arose during Student C's interview. As a confident peer reviewer, Student C suggested that her apprentice status could be advanced by developing peer triads - with a student and an experienced teacher jointly reviewing another experienced teacher's skills. Potentially, this could strengthen students' graduate attributes, by developing the accuracy of evaluative judgements and putting oral communication skills into practice with experienced teachers. Furthermore, students would be exposed to teaching of varying quality and in different contexts, as recommended in Nicol's (2014) principles of peer review. Raising the students' position in the school community could also have implications for the sustainability of the peer review approach.

The second focus when considering sustainability of peer review explored the students' perceptions of the process. All tracked students talked about the supportive and collaborative process discussed by Sims and Walsh (2009). Some students said they had moved beyond the university's scaffolded peer review tasks and towards their own peer review systems during their teaching placements. There were even indications that the use of a peer review scaffold and associated terminology could become a barrier to sustainability:

> 'We watched each other teach every day and constantly gave each other informal feedback. We didn't want to call it peer review because people panic a bit.'                (Student B).

Further insight into engaging students in this process and sustaining it came from Student A's final interview. He appeared to have moved away from his initial view of feedback being the tutor's role:

> 'My opinion about peer review has changed for the better. We fed back to each other throughout the teaching placement, saying that was good because… or perhaps you could have thought about…'

Aligning with Biggs and Tang's (2011) proposal to develop a deep level of student engagement, Student A attributed his newly-found motivation to being informed about the principles of peer review from the beginning through the workshop introducing students to peer review. This focus on peer review literature to explain its purpose and potential benefits was his investment turning point. However, his final interview comment offered a challenge to the university tutor that is not unfamiliar: 'The tutor has to convince people that being a peer reviewer is worth their time – then they'll invest.'

**Conclusion: ways forward**
This action research study aimed to provide an understanding of an authentic situation through in-depth analyses of students' responses to an intervention. The students in the study were identified as developing the key graduate attributes of producing evaluative judgements and oral communication skills as they became peer reviewers. The contribution of these attributes towards students' development of self-regulation was evident, with positive indications of the sustainability of peer review in the students' future professions, although potential challenges of the peer review process were identified.

This study also intended to provide suggestions for ways forward, and these will be considered now. Aspects that the tutors are considering for development in relation to this specific intervention are:

- matching peers by ability, to enable higher ability students' knowledge to transform by experiencing cognitive challenges associated with collective thinking, rather than solely knowledge consolidation;

- for students to review their received reviews, to increase the value of the peer review process and enable self-regulation of evaluative judgement and feedback skills;
- for students with lower subject knowledge, experience or confidence to review peers' strengths only, instead of struggling to devise potentially unknown targets.

Furthermore, as the long-term success of a peer review mechanism in developing some key graduate attributes depends upon its impact beyond HE, commitment to tracking this cohort's developments through and beyond their degree could provide new insights into the influence (or not) of a student-centred feedback approach on their future professional attributes of evaluating quality and oral communication skills.

As university tutors, we found the students' reflections revelatory, offering perspectives of peer review related to their unique contexts.  We were also impressed by the students' readiness to become peer reviewers, realising that – whilst acknowledging their different developmental needs – their capabilities should not be underestimated.  As feedback producers ourselves, we discovered that analysing the students' peer reviews offered an insight into the type of feedback comments they value.  We acknowledge that future use of peer review needs ongoing revision as student cohorts and their contexts change.

The students' responses towards peer review in this small-scale research - and previously discussed studies - are encouraging.  However, attempting to move from the apparent safety of tutor-generated feedback towards a more student-led system may be challenging, unless there is opportunity and evidence of its positive influence on the high stakes summative outcomes valued by HEIs.  This paper focused on some key graduate attributes: these skills of producing evaluative judgements and communicating feedback orally will be essential to these students' future professions, and also as qualities that may contribute to successful self-regulation.  Whilst acknowledging caution of university courses becoming solely for developing employment, HEIs tend to not formally monitor the development of such attributes.  Raising the status of graduate attributes may be essential to enable students to not only achieve the graduate aim of contributing to learning in society, but also to be prepared to tackle complex problems in potentially unforeseeable circumstances in their futures.

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