

# **Systematic peer reviewing versus a discussion forum for promoting online learner success: an evaluation of innovative learning design for postgraduate students**

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## **Abstract**

Designing distance learning to ensure student success is of high importance and there are well-known aspects of distance online learning that encourage retention such as regular tutor support, clear structure, student self-reflection and online discussion with peers (Doig and Hogg, 2013). A module for a new Postgraduate Certificate in Learning and Teaching in Higher Education at the University of London was recently designed using these plus innovative pedagogic features to promote student success. The design included alignment between the assessment criteria and weekly discussion forum activities. An ipsative assessment criterion indicated to students that they must demonstrate their development and progress with their learning throughout the module to encourage consistent engagement. The design also included a peer review process that was managed through the Virtual Learning Environment with student reviews that were anonymised. To identify which aspects of the design promoted success, we collected data analytics for 50 students and explored links between online discussion forum participation, peer review activities and student marks. Contrary to popular expectations, engagement with the discussion forum is not a very good predictor of completion and success. By contrast, engagement in peer review, and especially giving feedback to peers, is a good predictor of success. Furthermore, early drop out from peer review links to incomplete submission of assessments. Thus, spending time on task in the peer review links to high or moderate performance, although a few exceptions indicate that different learners might use different tools for success. This study suggests a number of avenues for tutor development in online learning to encourage retention such as using peer review activities that are time bound and well organised. Assessment could include criteria for developmental progress as well as outcomes.

**Key Words:** design, peer assessment, retention, student success, ipsative assessment

## **Introduction**

The University of London Worldwide has developed an innovative online Postgraduate Certificate (PgCert.) in Learning and Teaching in Higher Education with the aim of providing professional development for lecturers in the UK and worldwide. The PgCert. was designed to present good pedagogic practice and effective use of online tools. The design of the programme includes aspects of distance online learning that encourage retention such as regular tutor support, clear structure, discussion with peers, reflection, tracking of progress and digital videos (Doig and Hogg, 2013). The first of two modules also included the innovative attributes of ipsative assessment and peer review activities, with the aim of both ensuring student success and modelling good online learning practice.

Retention has long been a challenge in distance education (Simpson, 2003) and firstly we were interested to explore, how online tools influence performance and retention and enable progression to the second module of the programme. Secondly, we aimed to investigate whether or not the online data analytics are useful for enabling 'at risk' students to be identified early in the programme. Using data from the first two cohorts taking this module, we

investigated the relationships between the quality of engagement with a) discussion forum activity and b) with peer review throughout the module and final overall attainment.

After briefly exploring the pedagogic rationale for the module design in more detail, this paper will outline the learning analytics and qualitative mixed methods approach and present findings which indicate that the relationship between student engagement with online tools and student success is a complex one. The paper challenges common assumption that discussion forum activity levels predict student learning and subsequent success or failure. The paper concludes that structured peer review is very valuable for professional distance learners and student giving and receiving of feedback provides a good predictor of success whereas level of participating in a discussion forum does not predict success or failure. Thus, resources should be allocated accordingly.

### **Module design: online tools and ipsative assessment**

The initial module *Supporting Learning, Teachings and Assessment* was designed to support both reflection on learning and peer engagement. Learners are prompted to write about their current teaching practice and ways in which they can develop their practice in a reflective journal which they complete throughout the 22 week module. A mid-point assessment ensures that students have tutor feedback on reflective writing, as this might be a difficult concept for some. It has long been agreed that retention in online courses requires online interaction (Macdonald, 2001) and the module offers four evenly spread peer review activities, as well as opportunities for presenting and discussing ideas with peers in a weekly topic discussion forum. The assessment design includes: receipt of peer and tutor feedback, giving peer feedback and finally alignment with an ipsative assessment criterion. These will be discussed in more detail next.

#### *Feedback from a tutor*

It has long been argued that early formative feedback helps students improve their work (Black & Wiliam, 2009) if the feedback is future-orientated, and can be applied in a subsequent assignment (Hattie & Timperley 2007). The module under investigation had an early piece of assessment that is both summative and formative and provided students with early feedback on their ability to reflect on their practice. Students also had opportunities to benefit tutor feedback in the weekly discussion forum.

#### *Peer Review*

Effective feedback is defined by Molloy and Boud (2013) as enabling students actively to compare their work with the expected standards and criteria and not passively 'receive' feedback. Peer review can provide a useful mechanism for engaging students in feedback practice and Nicol, Thomson and Breslin (2014) have argued that peer review enables students to see problems in the work of others that they might not see immediately in their own work. Thus, giving a peer feedback may be more beneficial than receiving peer feedback. Being active in a feedback dialogue with peers also helps students understand assessment criteria and standards so that they can undertake self-review and self-critique and become less dependent on tutor feedback and instruction (Nicol and Macfarlane-Dick, 2006).

Systematic peer review workshops were presented to students four times across the module. These workshops were managed in the Virtual Learning Environment (VLE). There was an initial phase where students submit a piece of work for peer review. After a week, the system switched to peer review and students were allocated two others to review at random. There was no marking involved although that option is a possibility. After the first peer review workshop, the tutor posted some exemplars of feedback to help students who were unsure

about peer review, although this was not a pre-planned intervention as part of the module design.

There were also opportunities for peer discussion and feedback in the weekly discussion forum. These were linked to structured, tutor-guided activities.

*Final assessment includes ipsative criterion requiring students to provide evidence of their progress.*

Assessment is key to retention, but students may not realise that they are not making sufficient progress until they received a poor mark or grade and it is too late to take action. Early intervention and feedback can help students with their learning, but for many students feedback on a poor performance can be demoralising and they do not respond appropriately (Hughes 2014). However, there is evidence that students are motivated by ipsative feedback, which informs them of the progress or personal learning gain they are making, and helps them identify areas that need attention (Hughes 2017). Such feedback could improve student attainment and help with retention and progression. However, progress in response to feedback needs to be captured and made explicit otherwise learners may not be aware that they are (or are not) making the personal learning gains that will enable them to succeed in the summative assessment (Hughes 2017).

Therefore, the module assessment design encouraged students to gather material for their assessment from the start with an emphasis on rewarding progression as well as outcomes by including an ipsative component in summative assessment. The final summative assessment – a portfolio of development and achievement in teaching theory and practice - explicitly rewarded awareness of personal learning gain by including the ipsative (learning gain) marking criterion:

*4. Evidence of development of own ideas, values and approaches in relation to critical analysis of effectiveness in teaching and learning including within their own discipline.*

Online tools such as peer feedback workshops and discussion activity are learning gain enablers and aim to help students meet this criterion through self-critique and reflection on their own learning as well as the learning of peers.

### **Study methodology**

The study aimed to explore any relationship between student engagement in discussion and/or peer review and the final student outcomes (marks). Key research questions were:

1. What is the relationship between the quality of engagement with online learning tools throughout the module and final overall attainment?
2. How far does giving feedback to and receiving feedback from peers influence attainment in the two assessments?

The forum posting and the peer review workshops were captured online and were used as data sources. Assessment and feedback data was also accessible. The total number of student records analysed was 52, but 1 student repeated the module and so appears in both sets of results. Although these students were spread over two cohorts with different tutors the module design was the same for both and the pattern of tutor support and marking was comparable with the same second marker used to moderate the marks for both the cohorts.

*Discussion forum postings*

Overall learning engagement in forum posting was recorded by counting the total number of posts that were about the course content. Romero et al (2013) have suggested that participation in a content related discussion is a good predictor of student success. Posts that were about the course practicalities or technical or social matters were excluded so that the forum posting count would be an indicator of knowledge building rather than social interaction or accessibility (see Hughes 2010 for a discussion of the distinction between these functions of a discussion forum). The forum postings were categorised as over 30 messages = very good, 10-30 messages = good, below 10 = poor, 0 messages = no engagement

### *Peer Review Workshops*

The students' engagement with the four peer review workshops was recorded by counting the total number of contributions that were made. All students were randomly assigned two other partner students, and a note was made of which students gave and received feedback to their assigned partners. It has been suggested by Nicol, Thomson and Breslin (2014, p.102) that the giving of feedback is more beneficial than the receiving of feedback as 'producing feedback reviews engages students in multiple acts of evaluative judgement'. Engagement with peer review workshops was classified as three or more workshop contributions (both giving and receiving feedback) = 'Strong'; two workshops = 'Moderate' and one workshop = 'Weak' with zero workshops = 'No Engagement'.

### *Assessment Data*

Data recorded in the VLE was anonymised including:

- Interim assignment 1 mark
- Final portfolio assignment 2 mark
- Feedback on development of ideas in response to ipsative marking criterion 4.

This data was then matched to the individual student numbers for the other data collected on engagement. Students were divided into three categories: high achievers (both assignment marks distinctions and/or merits), moderate achievers (passes/one merit) and fails/non-completers. In the second cohort, a pass for the first minor (25% weighted) assignment and a distinction for the second main (75% weighed) assignment was counted as a high achieving student as the overall result would be at least a merit.

## **Findings and discussion on the engagement of high, moderate and low performing students**

### *High achievers*

We might expect that high performing students would engage well with all main online tools and low achieving student will not engage. However, the results indicate some complexity here. Both cohorts showed similar patterns of engagement and outcomes and so the results have been combined in the tables below.

**Table 1: High achievers and engagement with the discussion forum and peer review  
n=15**

Student number a=cohort 1	Discussion forum engagement no. of quality knowledge	Engagement with Peer Review Workshops	Assessment 1 submissions	Assessment 2 submissions

b = cohort 2	building posts (not social or practical arrangements or introductions)			
1a	36	Weak	distinction	distinction
2a	6	Strong	distinction	distinction
4a	4	Moderate	merit	merit
8a	11	Strong	merit	merit
9a	23	Strong	Distinction	Merit
14a	9	Strong	merit	merit
10b	1	Moderate	merit	merit
13b	4	Moderate	merit	merit
21b	3	Moderate	merit	merit
26b	8	Strong	merit	distinction
23b	9	Moderate	merit	merit
27b	45	Strong	pass	distinction
34b	9	Strong	Pass	distinction
33b	10	Strong	merit	merit
32b	55	Strong	merit	distinction

**Table 2: Breakdown of high achievers' engagement in discussion forum and peer review n= 15**

Educational discussion forum posting number of students			
Very good	good	poor	No posting
3	3	9	0
Engagement with peer review number of students			
Strong	Moderate	Weak	None
9	5	1*	0

\*student had very high discussion forum engagement

Engagement with the discussion forum did not predict outcomes for high achievers. Although students 1a and 27 b and 32 b had high posting of messages (over 30) and a further 3 students had good posting (10 or more), 9 out of the 15 students had a low posting (under 10). See tables 1 and 2.

While engagement in the discussion forum was not linked to outcomes for the students who passed while there was a clear association between engagement in peer review and outcomes.

In the initial analysis of the peer review workshop data of the second cohort, seven students with strong engagement achieved either merit and / or distinction in the two assessments. Two additional students 27b and 34b who achieved a pass and a distinction were later added to the high performer category as it was felt that overall the weighting of the two assessments equated to two merit grades.

Aside from the one student 1a, who had weak peer review workshop engagement, and could potentially be regarded as an outlier, 14 of the 15 students with strong or moderate engagement were classified as high performers over the two cohorts. Student 1a had an exceptionally good record of discussion forum posting and this could explain the successful outcome and might indicate that either engagement in the discussion forum or peer review leads to success.

*Moderate achievers*

**Table 3: Moderate achievers and engagement with the discussion forum and peer review n= 18**

Student number	Discussion forum posts	Engagement with Peer Review Workshops	Assessment 1	Assessment 2
11a	4	Strong	pass	merit
12a	1	Strong	pass	pass
15a	1	Strong	pass	pass
17a	12	Strong	merit	pass
19a	32	Strong	merit	pass
20a	1	Strong	pass	pass
21a	12	Strong	merit	pass
11 b	3	Strong	pass	merit
12b	2	Moderate	pass	pass
20b	14	Strong	pass	pass
7b	51 many long and detailed	Strong	pass	merit
1b	3	Moderate	Merit	pass
28b	0 but has logged in recently (1 in previous run)	Weak (strong if previous module is counted)	passed previously	merit
29b	14	Strong	pass	pass
31b	1	Weak	pass	merit
8b	20	Strong	pass	merit
15b	3	moderate	merit	pass
22b	32	Strong	pass	merit

**Table 4: Breakdown of moderate achievers' engagement in discussion forum and peer review n=18**

Educational discussion forum posting: number of students			
Very good	good	poor	No posting

3	5	10	0
Engagement with peer review: number of students			
Strong	Moderate	Weak	None
14	3	1**	0

\*\* this student also had low discussion forum engagement

With moderate achievers, the number of postings again does not predict achievement again as the majority (10 out of 18) had low numbers of posts yet still passed. See tables 3 and 4.

Regarding the moderate achievers, and peer review workshop engagement, 17 of the 18 students had either strong or moderate engagement. In both the first and second cohorts, four of the students in each group achieved a merit in one of the assessments with strong engagement. The pattern of peer review workshop engagement with overall achievement therefore seems to indicate a strong association.

There are some outliers that do not fit the overall pattern and these were further investigated which gave some explanation for why the findings were exceptional. Two students (28b and 31b) had weak engagement with both the discussion forum and the peer review workshops yet successful outcomes of a merit in the final assignment. Student 28b had attended part of the module in a previous run and had passed the first assignment and then deferred the second assignment to this run. This student engaged in peer review workshops 1 and 2 previously, but only had 1 discussion forum posting. This combined with engagement in peer review workshop 4 gives an overall profile of strong engagement in peer review but weak posting. Thus, this student is not out of line with the others.

Student 31b does seem to be exceptional in that the student had weak engagement in both peer review and discussion posting, yet gained a merit in the final assignment. Further inspection of the record of this student revealed that s/he had downloaded all the course materials. This is an option especially for students who have variable internet connection, and it seems that this student was successful at self-study without peer interaction in the print distance learning tradition. The student received tutor feedback on the first assignment so had support.

#### *Low achievers/non-completers*

**Table 5 Non-completion/fail and engagement with the discussion forum and peer review n=19**

Student number	Discussion forum engagement no. of quality knowledge building posts (not social or practical arrangements)	Engagement with Peer Review Workshops	Assessment 1	Assessment 2
3a	3	Weak	Withdrew	
5a	0	No engagement	Did not submit	Did not submit
6a	1	Moderate (early on)	Did not submit	pass
7a	0	No engagement	Did not submit	Did not submit
10a	0	No engagement	Did not submit	Did not submit

13a	0	Moderate (early on)	Did not submit	Plans to re-enrol on the module
16a	1	Moderate (early on)	pass	Did not submit
18a	6	Moderate (early on)	Did not submit	fail
22a	1	Weak (early on)	Did not submit	Did not submit
25b	1	No engagement	Did not submit	Did not submit
5b	4	Weak (early on)	Did not submit	Did not submit
6b	0	Moderate (early on)	Did not submit	Did not submit
18b	0	Weak (early on)	merit	Did not submit
30b	3	No engagement	Did not submit	Did not submit
2b	3	No engagement	Did not submit	Did not submit
3b	7	Weak (early on)	pass	Did not submit
16b	0 but has logged in	No engagement	Did not submit	Did not submit
24	0 but has not logged in since October	No engagement	Did not submit	Did not submit
19	0 Never logged in	No engagement	Did not submit	Did not submit

**Table 6 Breakdown of low achievers' engagement in discussion forum and peer review n=19**

Educational discussion forum posting: number of students			
Very good	good	poor	No posting
0	0	10	9
Engagement with peer review: number of students			
Strong	Moderate	Weak	None
0	5 (early on)	5 (early on)	9

All 19 non-submitters or fails had very low or no postings as expected. Five of the ten students that engaged minimally with the discussions submitted one assignment or withdrew, and these students may resubmit and pass in future. See tables 5 and 6. Thus, low posting might provide a warning for poor outcomes, but as we can see above students with low engagement in the discussion forum can also succeed.

There are two groups of students in the non-completion/fail group. One group consisted of those who did not engage in either the discussion or the peer review workshop and these 9 non-starter students did not submit. The remainder engaged to a weak or moderate extent



with the early activities of peer review and 5 students in this group submitted one assignment (students 6a, 16a, 18a, 18b and 3b) and student 13a plans to re-enrol (see table 5).

Therefore, some early weak or moderate peer review activity is associated with partial completion of the assessment. These students could possibly retake the module and complete the outstanding peer reviews or engage in discussion and/or they could retake a failed or non-submitted assessment. Student 3a withdrew early which explains the lack of sustained engagement and may have good reasons.

## **Conclusions and recommendations for distance education practice**

### *Peer review predicts learning outcomes but discussion forum posting does not*

The results were similar for both cohorts in that the number of educational forum postings does not correspond to successful outcomes although all the failures or non-submissions have zero or very low posting. However, the strong and moderate engagement with peer review workshops are associated with success and weak or moderate engagement early on is associated with partial submission or plans to re-enrol. Thus, peer review is much more linked to success at any level than engagement in the discussion forum. As with the discussion postings, non-engagement in peer review predicts non-submission.

Thus, it seems that some form of engagement throughout the module leads to successful learning and peer review activity is more significant than posting in the discussion forum. Nevertheless, it does not necessarily matter which particular activity or combination of activities the student spends time on when there are alternative ways of learning online available. In the study, one student (1a) was successful after high engagement with discussion but not the peer review, while another student was successful after downloading the course materials and presumably working on these offline. This is consistent with research that indicates that significant time spent on reading and writing tasks produces learning gain (Arum and Roska 2011).

### *Peer review as a compulsory activity*

Many of the students on this module viewed peer review as an essential part of their learning, unlike discussion forum activity which was treated as optional, and a quote from one student in the online discussion supports this:

*I felt the Peer Review Workshop helped me the most. I felt by looking at the review that others gave me and comparing it to mine, I learnt more than I learnt in any other activity (student 19a).*

Although there is not much research on peer review in distance education, Madland and Richards (2016) also suggest that peer review is very beneficial. It is not clear from these findings which combinations of the stages of peer review are most helpful for learning and achievement: posting a piece of work for review, receiving peer feedback on this and reviewing another piece of work. Nicol, Thomson & Breslin (2014) argue that all three steps are beneficial in that students have to reflect on the requirements for the task and consider the assessment criteria for each step of the peer review process.

We might ask why these students treated discussion as non-compulsory, yet did not view peer review as optional. The structure of the peer review workshop into a clear submission and peer review phase, and the management of the peer review online through allocating peer reviewers and recording when these had been completed, sends out a clear message that

online managed peer review is important. It is presented as being on a par with formal summative assessment rather than an optional process for formative assessment, even though marks are not allocated. Hughes (2014) proposes that having an ipsative assessment criterion motivates students, in this case to take part to gather evidence of their learning and peer engagement. All successful students performed well on this criterion.

### *Implications for practice*

Resources for distance learning, especially tutor resources are limited. This study suggests that it might be better to put resources into peer review rather than tutor contribution to discussion forum posting for professional postgraduate learners such as these and the findings may well apply more broadly for other learners on programmes with a similar design. However, setting up peer review activities that are worthwhile and give good guidance to students may be time-consuming. In an ideal situation both are recommended to maximise learner engagement and success.

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