

Teaching Chemistry in Higher Education

A Festschrift in Honour of Professor Tina Overton

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Undergraduate screencast presentations with self-, peer-, and tutor-assessment

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The aim of this work is to describe the use of screencast presentations with first year undergraduate chemistry students to enable presentations to take place without significant timetable demands. I also describe self- and peer-assessment protocols that include tutor moderation and opportunities for students to reflect on their performance. A series of exercises and evaluations were carried out to establish assessment criteria and investigate key issues.

It was found that screencast presentations are an effective means of including a presentation assessment in large cohort classes. The format allows students the chance to review and reflect on their performance, and this is enhanced by conducting self- and peer- assessment. Reflection takes place in an assignment that develops several skills deemed important by employers of chemistry graduates including digital literacy.

The self- and peer-assessment regime outlined here is broadly applicable to other assessments. The use of screencasts to offer more opportunities to practice presentation skills is applicable to many other contexts. Screencast or video presentations offer a possible alternative to in-person presentations to overcome timetabling issues, build skills including reflection and digital literacy, or to provide a viable alternative for disabled students or those for whom in-person presentation represents significant challenges.

Influence of Professor Tina Overton

Prof. Tina Overton has been a significant influence on my career, from running the New Lecturers in the Physical Sciences course, through interactions at Variety in Chemistry Education and on to 'Getting Started in Pedagogical Research', the precursor to Methods in Chemistry Education Research. Tina made a career in chemistry education, something that fascinated me greatly as a new lecturer, seem possible and she generously provided the tools to get started through publications and courses. This project was done as part of my MA in Learning and Teaching in Higher Education, a course I don't think I would have attempted had it not been for Tina's influence.

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Introduction

In this chapter, I will describe an assignment asking first year English chemistry undergraduate students to produce five minute screencast presentations and will reflect on its evolution over seven years with the aim of making recommendations for implementing this type of activity in other institutions. I also describe the assessment regime used which comprises self- and peer-assessment that includes tutor moderation and opportunities for students to reflect on their performance.

Presentations as a valuable skill

A 2007 study of chemistry graduates found that just over 80% rated presentation skills as useful or very useful however just over 60% of those surveyed felt that these skills were well or very well developed in their degree programme (Hanson and Overton, 2010). These findings were supported more recently by Galloway (2017). Skills development may be embedded within specific modules or in stand-alone modules in professional development such as that described by Galloway (2017). The 2008 *Review of the Student Learning Experience in Chemistry* (Gagan, 2008) indicated that chemistry departments regularly embed transferrable skills such as presentation skills into curricula however the survey does not quantify the extent to which skills are developed. Presentations are a valuable and authentic form of assessment and enhance the diversity of assessment in courses (O'Neill, 2011; Ritchie, 2016). Typically, they are a time-consuming assessment format requiring significant contact time and staffing resources. To maximise the benefit from providing an assessment, students should:

- be sufficiently motivated to take the assessment seriously;
- be able to perform to the best of their ability and circumstances;
- have an opportunity to reflect on their performance in the context of their peers.

Presentations may be broken down into several components and this assignment addresses several of these (Table 1). Motivation may be intrinsic or extrinsic: the topic is interesting to the student, or the assessment is worth sufficient marks to make it worthwhile (Black and Deci, 2000). Performance anxiety may be related to the degree of preparedness or stress experienced when contemplating presenting to a group of peers/staff. The introduction of a presentation in Year 1 was seen as the starting point for developing presentation skills throughout the chemistry degree programmes at Keele University.

Reflection is challenging when presenting in person although lecture capture and video solutions have been proposed to allow students to review their performance (Smith and Sodano, 2011; Ritchie, 2016). Key issues around using lecture capture and video technology relate to training students and tutors in the technology and editing to produce the final product, access to equipment and editing suites, and engagement for students with visual or hearing impairments. Performance rights and legal implications also require consideration (JISC, 2019). However these can be mitigated by limiting the sharing of the video/screencast, and advising the student on appropriate levels of security such as obscure URLs or password protection. Ritchie (2016) used lecture capture technology to provide an opportunity for students to carry out self-assessment on their presentations before performing the presentation again, demonstrating their ability to act on their reflections and noted an increase in performance when this took place. A cycle of self- and peer-assessment was implemented to encourage reflection on the presentations.

Screencast presentations

The screencast presentation assessment discussed here overcomes many of these issues by allowing students to create a presentation screencast in private to a standard that they are happy with, thus removing the performance anxiety that may be experienced. Choice of topic within a theme allows

Table 1: Tasks that must be completed by a student prior to giving an in-person presentation or submission of a screencast

In-person presentation	Screencast presentation
Identify topic for presentation	Identify topic for presentation
	Identify suitable software
Carry out research	Carry out research
Produce annotated bibliography/ reference list	Produce annotated bibliography/ reference list
Produce visual aids	Produce visual aids
Rehearse presentation	Record presentation
Give presentation to audience	Produce and upload presentation in suitable format
	Complete self-assessment after watching screencast

students to select an aspect that is personally interesting to them which may enhance intrinsic motivation, and the screencast format permits students to review their work at any stage in the assessment procedure. This adds requirements onto the students: the need to identify appropriate software; to record the presentation; and to submit it in an appropriate format. This can, however, be made an additional and valuable opportunity to develop digital literacies rather than being viewed as a barrier. Production of screencasts or videos has become common place in chemistry teaching through the increasing popularity of lecture capture (Haxton, 2016b), screencasts (Haxton and McGarvey, 2011; Mohorovičić, 2014) and online lectures (example: Khan Academy <https://www.khanacademy.org/science/chemistry>) which apply technology to communicating to students by tutors resulting in fairly passive engagement on the part of the students. Other initiatives such as student produced screencasts or videos have been reported by Ryan (2013) and Lancaster (2015). Tutor confidence in finding and using appropriate technologies may limit the use of screencasts in teaching. However this need not limit the use of technology by students. Sharpe and Beetham (2010) suggest a developmental model for effective e-learning that comprises four stages: functional access, skills development, practice and choice of technology, and creative appropriation. Figure 1 implies that allowing students to make choices about which technologies they use to complete an assignment provides the greatest opportunity for development towards creative appropriation. Telling students which tools to use barely rises out of the functional access stage.

Self-assessment

Self-assessment is a critical part of any learning process, whether done informally or formatively by a reflective student prior to submission of work, or formally required as a contribution by a tutor (MacDonald, 2011). Reflection is generally held to be the link between assessment, feedback, and improved learning. Sargeant states that three processes are involved: performance is assessed, feedback is provided to the students, and feedback is acted on by the student (Sargeant, 2006 as seen in Sargeant *et al.*, 2008). It can be challenging to get students to access and act on feedback, particularly if the links between past and current assignments are ambiguous. Self-assessment provides a formal means through which this reflection can be encouraged or structured, and may be carried out on submission, after peer-assessment, or after receiving feedback and a grade. Self-assessment is subject to some issues concerning reliability (students under- or over-estimating their abilities); bias, as both Langan (2005) and Pope (2005) report that females tend to rate themselves lower than males; and achievement as lower academic achievers may rate themselves higher than higher academic achievers (Boud *et al.*, 1999; MacDonald, 2011). Clear

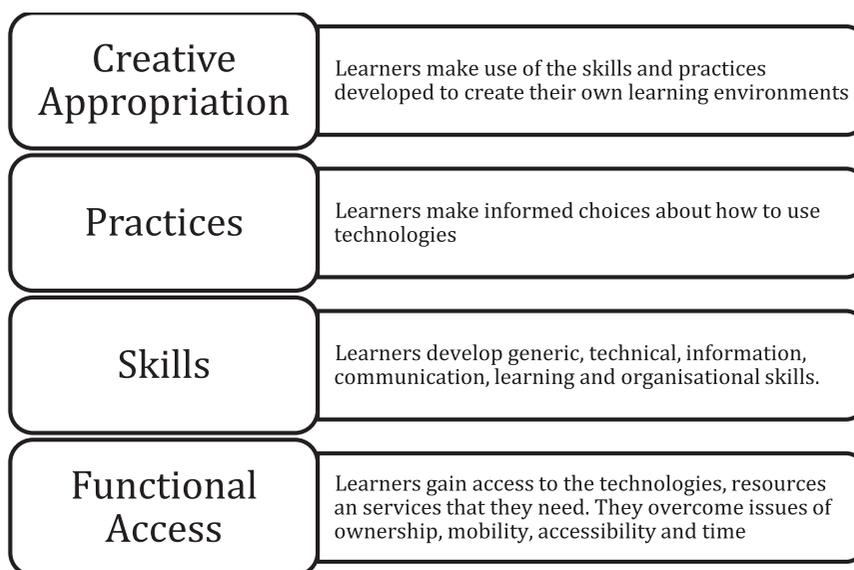


Figure 1: A developmental model of effective e-learning adapted from Sharpe and Beetham (2010)

assessment criteria and ensuring a shared understanding of the assessment criteria are strongly linked to better results whether it be better learning or closer correlation with peer and tutor marks (Orsmond, 1996; Miller, 2003). Carrying out self-assessment after peer-assessment may give students a broader sense of how their performance correlates to that of their peers.

Peer-assessment (and bias)

Peer-assessment is widely held to have benefits for student learning including enhanced problem solving ability, improving reflection, and development of self-motivation skills (Sivan, 2000). Criticism of peer-assessment relates primarily to its incorporation into summative assessment with bias and inconsistency in marks being the two most prevalent issues (Magin, 2001; Magin and Helmore, 2001). Several studies designed to investigate these effects led to inconclusive or contradictory results (Magin, 2001). Peer-assessment activities can occur across the range of assessment types but are particularly prominent in group work where the focus is on participation and may be facilitated by software such as CATME (Loughry, Ohland and Woehr, 2014). Peer-review as a form of peer-assessment has been evaluated in the engineering context where students complete work, review their peers' work, then apply the same assessment criteria to their own work. This allows students to gain directly from the process of peer-review as they learn to be more objective about their own work when evaluating their peers, while acknowledging that the peer feedback they receive may be of limited use (Nichol, 2014). More broadly, recommendations to improve validity and reliability include involving students in the development of assessment criteria (Dochy *et al.*, 1999; Sivan, 2000; Smith *et al.*, 2002; Stefani, 1994; Orsmond, 1996; Orsmond *et al.*, 2000) or moderation with a defined difference in marks acting as the trigger to the moderation process (Stefani, 1994). Peer-assessment was selected as a valuable component of this assignment because it mimics an intrinsic part of in-person presentations: being judged by the audience.

Methods/Design

In this section I will discuss the setting and scope of the screencast presentation assessment as well as how the screencast presentation with self- and peer-assessment can be implemented and evaluated.

Setting for the screencast assignment development and implementation

Keele University is a small English University with a range of combined honours and single honours chemistry and medicinal chemistry programmes. Many students study combined honours, coupling chemistry or medicinal chemistry with a second subject. In 2011/12 all students were on the combined honours Bachelors route (BSc). By 2017/18 around half of the cohort was studying for single honours chemistry degrees, either BSc or integrated Masters (MChem). As can be seen in Table 2 the size of the Year 1 cohort has varied considerably but is typically around 70 students.

The presentation assignment was initially implemented to replace a class test and develop a wider range of skills. Due to timetable constraints, it could only occupy the same contact time as the class test — one hour. This assignment was compulsory for students and reassessment was offered to students who did not submit. Reassessment was assessed only by tutor assessment.

Table 2: Evolution of assessment; threshold mark is the minimum mark required to pass the assignment (All modules are 15-credits reflecting 150 hours of effort)

Year	% of module	Threshold Mark	Submissions	Topic
2011/12	10	20	33	Inorganic Chemistry (list of possible topics given and topics approved before submission)
2012/13	15	40	68	General
2013/14	15	40	53	General
2014/15	15	40	78	<i>Chemistry of Space</i>
2015/16	15	40	99	<i>Chemistry goes to the Movies</i>
2016/17	15	40	114	<i>Chemistry for the Future</i>
2017/18	20	0	59	<i>Chemistry without Carbon</i>

Timing of screencast assignments with self- and peer-assessment

A major consideration in implementing this assessment is selecting the best time of the semester to begin. The cycle of 1st self-, peer, and 2nd self-assessment takes several weeks (Table 3). This had to be designed to take into account institutional guidelines for late work (accept if submitted up to seven days late but cap mark at 40%) and so several delays of one week were introduced before the next phase. Three weeks were allowed for from the assessment briefing (typically a one-hour introduction session to presentation skills, the assessment cycle and the task — see Supplementary Information) to first submission of the screencast and Self-Assessment 1. This assignment was designed to be largely agnostic of material being covered in lectures. Two weeks were allowed for peer-assessment and students were asked to complete Self-Assessment 2 after completing all the peer-assessments and watching their own presentation once more.

Selection of format and software

A key aim of the assignment was for students to find and use appropriate software for the task. Detailed

Table 3: Structure of assignment (see Supplementary Information for further details)

Week	Task
1	Assessment briefing session (one-hour contact time)
4	Phase 1: Submission of presentation and Self-Assessment 1
5	Seven-day late deadline for presentation and Self-Assessment 1
6	Phase 2: Peer-assessment begins
8	Submission of peer-assessment and Self-Assessment 2
9	Seven-day late deadline for peer-assessment and Self-Assessment 2
10	Marks moderated by tutor and returned to students with peer-feedback

assessment guidelines that included some straightforward software suggestions and requirements for submission were produced. However, it was ensured that there was sufficient flexibility for students to innovate if they chose to. This shifted responsibility for providing technical support from the instructor to the students and removed the need for the instructor to be an expert user of software. The presentation had to be submitted as an MP4 file that could be played through the virtual learning environment (VLE) or as a URL to a non-password protected site such as YouTube. A degree of privacy is possible with YouTube as URLs are obscure and it is possible to set up a pseudonymous account. More recently, sharing through GoogleDrive has been used. In order to make use of trial versions of software or free online tools, presentation were limited to five minutes in length and guidance given on how to mark presentations that went over this limit. Care must be taken to avoid recommending trial versions of software that produce outputs with watermarks or in a low-resolution format. It is considered appropriate to instruct markers to disregard watermarks or low-resolution formats, however this can be a challenge for students carrying out peer-assessment.

Proprietary file formats can be a significant access issue and it is recommended that submissions are checked before peer- assessment commences, or that wording is put in assessment guidelines to make it very clear that if the markers cannot view the presentation, they cannot mark it, and the responsibility to fix it lies with the submitter. Generally students were allowed to fix minor issues after the deadline that were reasonable to overcome (for example, technology, format or access issues such as password protection). It is useful for the tutor overseeing the assessment to demonstrate a small degree of flexibility. Clear guidance on the use of video segments produced by other people in the presentation is required and typically I recommended less than 10% of the total length of the video.

Presentations have been submitted as narrated PowerPoint, talking-head videos, animations, and occasionally as PowerPoint slides with an audio file attached. To simplify assessment, all presentations were required to include an audio and a visual component — submitting an audio only file or submitting only visual aids such as slides was penalised.

Copyright and plagiarism

The independent research element to the assignment has been enhanced in recent years by requiring an annotated bibliography in addition to the presentation, as well as references on the slides. This assignment is an excellent introduction to copyright and other issues around fair usage as the use of images, animations, videos, and music obtained online is common. Students may need reminding that it is a form of plagiarism to copy the style and content of videos found online without appropriate attribution. Clarification needs to be given as to whether things like presentation software templates should be referenced, and how to use open-source images ethically.

Assessment

Development of assessment criteria

In the first and second years of implementation, the one-hour assessment briefing session included an exercise to determine what the students valued when assessing presentations. This was removed in later years as the assessment criteria were refined and clarified. This is not an essential part of implementing this assignment and different approaches to achieve the same goal of developing shared understanding of the assessment criteria could be used. An alternative would be to have students apply pre-designed assessment criteria to an online science presentation or, for the brave, to a segment of a lecture!

The assessment criteria development exercise involved asking the students to consider scientific presentations they had viewed or showing a video of a presentation, and asking them to reflect on what the most important aspects were either individually or in small groups. This revealed interesting differences in responsibility between different types of markers. The prompt questions were:

- When evaluating your own work, what do you think are the three most important things to assess?
- Think about presentations you have seen on science topics, what are the most important aspects to you?
- If you listen to a presentation, are different things important?
- What do you think your peers should assess when they watch/listen to your presentation?
- What do you think you should assess when they watch/listen to your presentation?
- What do you think you should assess when you watch/listen to your own presentation?
- What do you think your tutor should assess when watching or listening to your presentations?

I analysed the responses to these prompts by thematic analysis, a process of grouping together similar answers and determining which are the most common. (Haxton, 2016a; Nowell *et al.*, 2017) I assumed that the most common responses reflected the aspects the class as a whole gave greater importance to. I used these to derive the key marking scales for self-, peer-, and tutor analysis in the first year of implementation. These were updated in the second year of implementation when the exercise was rerun. In the subsequent five years, the assessment criteria were updated to be more explicit giving clearer guidance to the students when applying them. This was found to be beneficial in encouraging students to make wider use of the whole mark scale.

Assessment criteria

An introduction talk was given in which the standards and expectations for the assignment were described (see Supplementary Information). This included information on the required reference format, the length and style of the presentation, the intended audience of the presentations (Year 1 university chemistry students at the very start of their studies), and a guide to the assessment phases.

Marking criteria were based on a series of Likert style scales, initially 1–5, but then incorporating 0 to account for non-completion of certain aspects, and moving to 0–10 in later years to allow greater differentiation in the marks. (Table 4). Students were asked to give feedback in three broad categories:

1. What did the presenter do well?
2. What could the presenter improve on?
3. Any other comments?

Table 4 (a): Marking scales for each type of assessment; initially a 5-point scale was used but to allow for greater differentiation, a 10-point scale was developed (1 was described as poor, 5 was described as average, and 10 was described as excellent)

Self-Assessment 1	1	2	3	4	5	6	7	8	9	10
How well do you think you have structured your presentation?
Are the key points of your presentation clear?
Have you covered all the aspects of your topic that you intended to?
Do you think your presentation is clear and concise?
Peer-assessment then Self-Assessment 2										
How interesting did you find this presentation?
Was the presentation well delivered?
How relevant was the content of the presentation?
Was it clear that the presenter had done an appropriate amount of research into the topic?
Was the presentation well prepared?

Table 4 (b): Marking scale for tutor assessment; this was used for in the first year for all presentations, and for reassessment in subsequent years

Component	1	2	3	4	5
Is the scientific content of the presentation accurate?
Are the references appropriate?
Is the content of this presentation suitable for the target audience (A Level or equivalent)?
Originality
Choice of format given topic
Audibility (if appropriate)
Clarity of explanations
Clear point to presentation
Quality of visual aids (if used)

The need to be constructive in feedback was emphasised, and feedback free text boxes were available for each peer-assessment element and for overall comments. Self-assessment 2 used the same form as the peer-assessment and students wrote feedback to themselves as a form of reflection. This often involved comparisons for each marking criterion to the other presentations they had assessed.

The breakdown of the final mark between self-, peer-, and tutor-assessment is given in Table 5. Self-Assessment 1 has generally been carried out through a GoogleForm, enabling a variety of question styles to be used (see Supplementary Information). Peer-assessment and Self-Assessment 2 has varied between GoogleForm and Blackboard's Peer- and Self-Assessment tool. From the second year of implementation, tutor assessment was removed and the grades produced from each assessment type were reviewed in a spreadsheet and moderated.

Table 5: Distribution of marks between different assessment formats for the screencast assignment; the approach implemented from 2012/2013 onwards is recommended

Year	Self-Assessment 1	Peer assessment	Self-Assessment 2	Tutor Assessment
2011/12	10%	50% (average of 3–5 students marks)	10%	30%
2012/13– 2017/18	15%	70% (average of 3–5 students marks with tutor moderation)	15%	Not incorporated

Moderation

The moderation process was designed to tackle any particularly low or high peer-assessment grades that were outliers for each presentation (typically greater than 10% different to the average in peer-assessment). Typical reasons for these grades were the peer-assessor being unable to access the presentation due to software or hardware issues and giving a low mark (and noted in feedback), or work being marked by friends who felt obliged to give a very high mark. Self-assessments have rarely been moderated as the majority of students give a fair appraisal of their work. However one instance where a student awarded themselves 110% was noted. The moderation process should be made clear to the students at the start of the assignment and careful consideration should be given about whether to release both moderated and unmoderated marks (allowing the peer feedback to be viewed in context) or only moderated marks.

Allocating peer assessors

If fixed groups are assigned for peer assessment, these should be allocated randomly or in a manner that ensures a range of ability in the groups. There is also evidence to suggest that ensuring a good gender balance in groups is important (Langan, 2005). Peer-assessment is open to bias and students with unfamiliar accents may be penalised for clarity. This can be overcome by making it clear that presentations are to be marked on quality of information conveyed. Implicitly assessing aspects such as audibility and clarity of speech may be discriminatory against students with certain conditions or strong accents. Adding these as explicit and distinct scales can allow for those marks to be discounted. This can be taken into account during moderation if issues are known, but also should be cautiously discussed with the class when the assignment is introduced — it should be possible to move beyond the superficial aspects of an oral performance to focus on the quality of the information.

Self-assessments

Self-Assessment 1 is completed as the screencast is submitted. Self-Assessment 2 should be completed after peer-assessment and with strong encouragement to the student to re-watch their work first. Questions that encourage reflection on their performance in the context of their peers may be particularly beneficial for some groups of students, allowing them to calibrate their output against that of others. This was done by asking students to write feedback to themselves using the same form as peer-assessment. This may help students develop greater assessment literacy.

Screencast topics

Each year, students were asked to produce a presentation on a given theme that related to their course but was not directly dependent on any content being taught in it. This allowed the assignment to run early in the semester. Topics ranged from *Main Group Chemistry* to *Chemistry for the Future*, *The Chemistry of Space*, and *Chemistry without Carbon* (see Table 1). These were selected because they were broad

enough to enable the students to select an aspect of personal interest to them. In the first and second years of implementation, I requested that students email me their topics for approval. This was to avoid two students doing the same topic. I felt this was unnecessary with such broad topics — the students rarely focussed on the same aspects even when selecting similar topics. Over the seven years, a small range of topics were constantly selected:

- Explosive substances
- Poisonous substances
- Fireworks
- Drugs

These topics were often done poorly due to breadth, and to the presence of a lot of simplified information online. Encouraging students to select topics that allow them to engage with primary scientific literature was challenging. In 2017/18, the theme was *Chemistry without Carbon* and presentation topics included:

- Hydrogen fuel cells
- Transuranic elements
- The Auger process
- Hydrogen peroxide in aquaculture
- Transition metals in medicine

Evaluation methods and ethical considerations

During the action research phase of this project (the first two years of implementation), ethical approval was obtained from the Student Project Ethics Board at Keele University (Haxton, 2016a). Action research is a research method that involves planning, doing and reflecting in cycles (Acosta and Goltz, 2014). Students were informed that the assessment was required but that participation in the research project aspect was voluntary with no consequence to their mark. Students participating in the project consented to their peer- and self-assessment feedback being analysed, for use of anonymous quotations from feedback comments, and for their marks to be analysed after pseudonymisation. Subsequent data (module marks, evaluation questionnaires) have been collected as part of the continuing evaluation and monitoring of the assessment as a teaching activity. Evaluation questions were typically asked during Self-Assessment 1.

Presentation and Discussion of Findings

Student feedback

This has been a broadly successful assessment format over the past seven years. As part of the continuing evaluation of the assignment, students were asked if they would have preferred to give an in-person presentation to a small group over a screencast (Figure 2). There has never been a clear preference observed across seven years with a reasonable number of student's seeing the advantages to both formats. Common reasons for preferring screencasts include the opportunity to perfect the presentation, confidence issues with public speaking, or learning new skills. Reasons for preferring in person presentations often related to obtaining and acting on instantaneous feedback from the audience throughout the presentation, being able to project greater enthusiasm through body language, or having technical difficulties with software.

Assessment regime — application of technology

The assessment regime has been complex to implement. No one technological solution that accommodates all preferred aspects has been found and compromises have been made (Table 6). For self-assessment, completing a self-assessment form as the work is submitted is the most logical work-flow. GoogleForms facilitates this well and allows easy sharing of files where the file creator retains rights to remove the work.

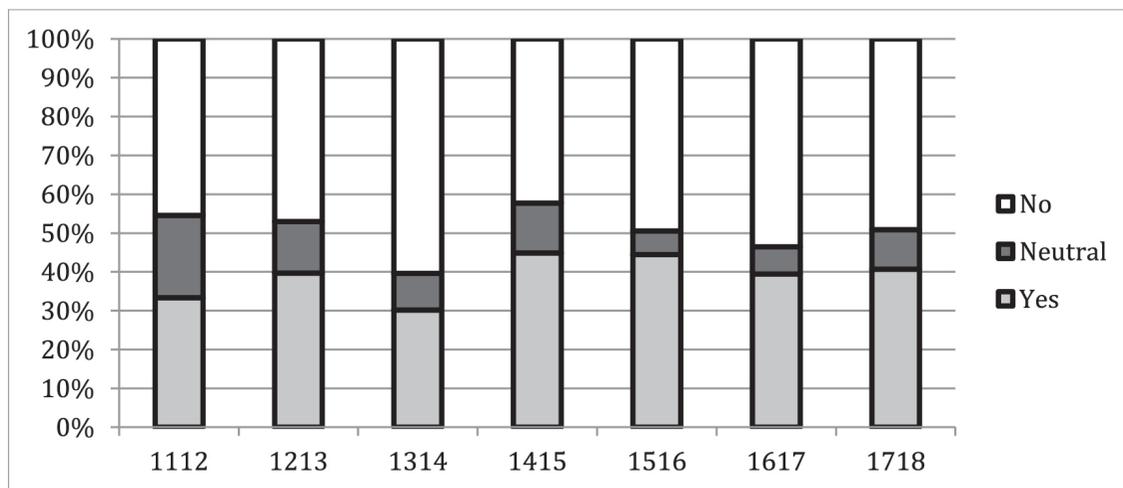


Figure 2: Student responses to the statement "I would have preferred to give my presentation directly to a small group of my class"

The hazard of this is that the work can be replaced after submission while retaining the same URL, giving a student more time to complete the task. Many of the issues surrounding peer-assessment, particularly the complex social dynamics of peer-assessing friends, may be mitigated by using the Blackboard Peer- and Self-Assessment tool which ensures a random allocation of presentations to each marker. The drawbacks of this tool are considerable and include (at the point of writing) no opportunity to revise assessment deadlines once deployed, blank submissions being displayed for students who did not submit their work on time, no easy means of accommodating university regulations regarding submission of late work (for example seven days late) other than to make the formal deadline seven days later than desired, no opportunity to customise the self-assessment aspect to expand the questions being asked, and no easy way of moderating marks or editing feedback. The drawbacks were significant enough to stop using this tool despite the ease of collating grades and feedback and returning to the students. These aspects should be given consideration if planning an assessment of this type.

The difference between Self-Assessment 1 and two varies between students. In general, student marks stay largely the same between self-assessments (Table 7). However a small number of students increase their marks and justify it based on those they have peer assessed, and some students' decrease their marks. Care must be taken with students who may be particularly critical of their own ability, seeing only flaws and few positives. There are a number of instruments such as multiple-choice questionnaires developed to assess self-efficacy and other learning attributes that could be used at the start of this assessment to flag students who may be more likely to doubt their abilities heavily (Bauer, 2005). Moderation could be introduced to self-assessment where students are awarding themselves marks significantly lower than their peers. A final option if tutor assessment is being used, would be to use the 5% rule. If a student's self-assessment mark is within 5% of a tutor's mark they are awarded the higher grade. If the difference is greater than 5% they are awarded the tutor's mark. This rewards and requires honest self-evaluation and penalises those who award higher marks as self-assessment to boost grades (Leach 2012).

In the first year of implementation, two approaches to Self-Assessment 1 were tried. The first was to ask students to award themselves a mark out of 20 for the presentation overall. This was compared to the students awarding marks out of five for four separate attributes which were then combined into a mark out of 20. Table 5 shows that the average marks did not differ significantly between the two models. From

Table 6: Software options for submission/self- and peer- assessment

Feature	GoogleForm	Bb Self- and Peer- Assessment Tool	Comments
Assigning groups for peer-assessment	Pre-assigned groups of 4–6 students (who all mark each other with risk of reciprocity)	Random allocation of 4–6 students to grade (each student marks a different set of 4–6 reducing risk of reciprocity)	Random allocation is beneficial as it reduces the chance of mutually high marks being awarded
Ease of returning grades to students	Fairly tedious — manual compilation of all marks and generating a format suitable for return to individual.	Inbuilt and easy	Plan in advance how you will return grades and feedback
Ease of moderating grades/feedback	Easy to manually edit feedback or marks	Difficult to moderate feedback. Moderating grades required downloading raw data and processing manually	
Ease of monitoring task completion	Difficult — requires manual consultation of class lists	Easy	
Altering questions/ deadlines after deployment	Easy — owner has complete control	Impossible	Bb Self- and Peer-assessment tool has limitations that include the inability to change deadlines after deployment and facilitate a 7-day late deadline?
Facilitating Self-Assessment	Allows submission of Self-Assessment 1 with presentation	Allows Self-Assessment 2 at the end of peer-assessment	Easy to implement a 7-day late deadline

the second year of implementation onwards, self-assessment by awarding marks for different attributes was used as this most effectively mimicked the process of peer-assessment.

A decline in participation of 33% between Self-Assessments 1 and 2 was noted when Self-Assessment 2 was not part of the peer-assessment process. This is likely due to a range of issues including forgetting, being tired of the assignment, or not seeing the value. Reminding the students that they were denying themselves marks by not doing it was a useful prompt. In response to this, Self-Assessment 2 was incorporated into the peer-assessment process.

In the first year, tutor assessment formed 30% of the mark and, after reviewing the peer-assessment marks, particularly that the range of marks awarded by the peer-assessors was reasonably consistent, this was altered to tutor moderation (Table 3).

Table 7: Average marks for all students in the first year of implementation for each element of self-assessment; note decreased participation in Self-Assessment 2

	Self 1a [†]	Self 1b [‡]	Self 2 [†]
<i>n</i>	45	45	30
Average (/20)	13.7	14.5	14.6
St. Dev.	2.3	2.4	2.2

[†]Students were asked to award themselves a mark out of 20 for their presentation.

[‡]Students were asked four questions (1–5 scale) which were then combined to give a mark out of 20.

Tutor assessment, when implemented, was focussed more towards accuracy and appropriateness. Tutor-assessment is generally held to be the standard by which the other assessments are judged in the literature yet studies comparing the reliability of marking between tutors indicate that there is substantial variation (De Grez *et al.*, 2012; Stefani, 1994).

Student discomfort with peer assessment

The mark schemes were changed in later years to reflect key aspects of presenting — particularly that peer-assessment is a valid and authentic method for presentations as it is the audience that judges the presenter. Anecdotally, students found participating in peer-assessment stressful both as assessors and recipients of peer-assessment feedback. The removal of tutor-assessment caused some discomfort among the students, particularly those who place more value on the tutor's judgement over their peers' (Pope, 2005). A persistent aspect of student feedback on this assignment has been discomfort with peer-assessment, and this has increased as the assignment has increased from 10 to 20% of a 15-credit module. In addition to the marking scales, students were asked to give peer feedback. In the first year of implementation, content analysis of this feedback (Figure 3) given by peer- and tutor-assessment was performed.

The comments focused on presentation, content, and delivery. This mirrored what the students thought in the assessment building exercise. Referencing style and format was commented on significantly. In later years, referencing requirements were made more explicit as the chemistry programme at Keele adopted a more cohesive approach to information literacy, culminating in co-submission of annotated

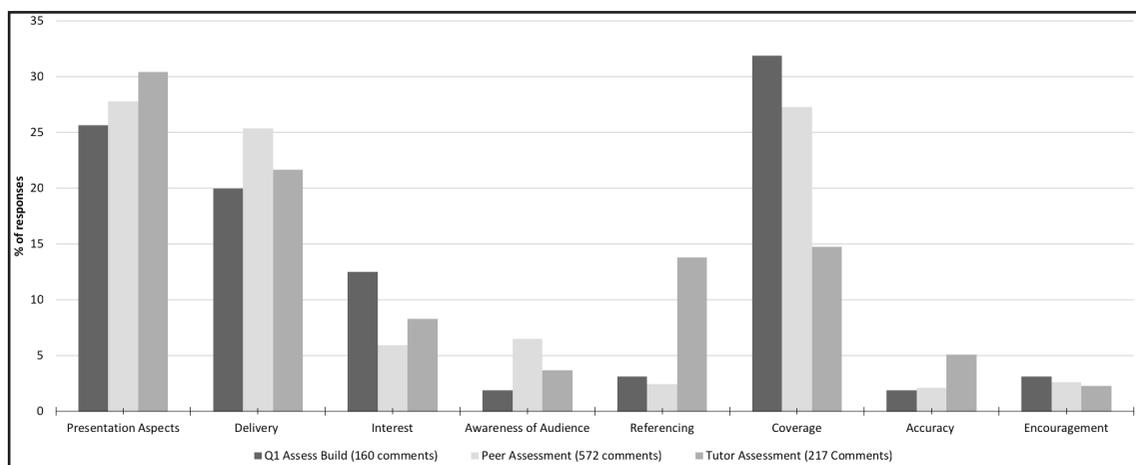


Figure 3: Content analysis of student responses to feedback during peer-assessment and feedback from tutor-assessment, compared to question 1 in the assessment criteria building exercise

bibliographies to detail what information comes from each source in preparation for work in later years. As a result, referencing and quality of information source has become a separate section in self- and peer-assessment. It is curious to note that in the assessment building exercise, 13% of comments indicated that finding the presentation interesting was important for peers, but analysing the peer feedback, interest was commented on 6% of the time.

Implications and Adaptability

This assignment has been developed, refined and evaluated over the past seven years. The processes described in this chapter can be adapted to many contexts in other higher education institutions where a means of improving and developing presentation skills, information and digital literacies are required without a substantial commitment of contact time. The use of two rounds of self-assessment and related peer-assessment to facilitate greater reflection could be applied in any assignment that uses peer-assessment. Screencast presentations permit students the opportunity to re-record and/or edit their work until they are satisfied with the standard. Screencasts may provide a useful alternative assessment format for students who are unable to carry out in-person presentations. There are several key aspects of this assessment that can be applied to other contexts:

- use of screencast presentations
- use of self- peer- self- assessment regimes
- use of reflection within assessment regimes
- use of screencasts to support second marking

Your context

The points below outline key aspects to be considered by those exploring the adoption of a similar approach:

- This assignment facilitates inclusion of presentations when very limited contact time is available.
- How will you incorporate reflection and self-/peer-assessment to maximise learning opportunities?
- You will need to have the confidence to allow/trust students to select the topic and software to complete the task.
- Have you factored in the time involved for data compilation necessary to work within a more complex grading/moderation scheme?
- The assignment has ranged from 10–20% of 15-credit (150 hours) module.
- While this assignment has had threshold marks of 0, 20, or 40%, the threshold mark can be dictated by institutional policy.
- Evaluation is in-built into self-assessment questionnaires but fully anonymised before analysis.
- Will you implement the collaborative assessment criteria development process initially (underpinned by literature precedents)?

Conclusions

Screencast presentations are a convenient and constructive method of introducing more presentations into busy timetables. In the seven years of this assignment, over 500 students have produced over 42 hours of screencast presentations. Screencasts also facilitate reflection by the student through self-assessment in the context of the work of peers. Having a recording of a students' presentation can facilitate second/

double marking by tutors as required by university policies.

Students generally cope with the demands of using software and hardware to produce work of a high standard. Self- and peer-assessment is effective with appropriate moderation, typically addressing marks $\pm 10\%$ of the average in peer-assessment. Moderation has rarely been applied to self-assessment.

Screencasts are particularly beneficial for students who suffer anxiety or low confidence in their presentation abilities. Allowing students to focus on producing a presentation they are happy with without the high stakes event of an in-person presentation is an appropriate first step in building up confidence. Students give in-person presentations in later years, both individually and in small groups. Most students are sufficiently confident in their ability to use computers, smartphones and appropriate software to produce a screencast with minimum intervention from the tutor. Care must be taken to suggest appropriate software and means of submission to mitigate any issues.

Discussion around good information sources, copyright and fair use of resources is essential. Annotated bibliographies can help encourage students to engage more with the sources of information rather than adding in additional references just to make the minimum requirements. It also makes it easier to distinguish between references used for graphics and references used for content.

Future work in this area involves formalising the reflection process on feedback in later years by including reflective exercises requiring students to re-read their feedback on this presentation before working on their next presentation. Engaging with feedback is a key aspect for effective learning and for making good use of staff time and resources used to provide feedback.

Supplementary Information

Supplementary information referred to in this chapter is available at: overtonfestschrift.wordpress.com.

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