## UNIVERSITY<sup>OF</sup> BIRMINGHAM

# Staff Guide

A Guide to Effective Feedback by Heather Collis & Mano Sivantharajah



The purpose of this guide is to offer suggestions on how to improve the effectiveness of feedback provided to students in the School of Mathematics. It also offers guidance that suggests possible uses of technology that can be used to aid feedback.

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## 1. Research into good feedback practice

• Advice on what makes good and effective feedback.

# 2. Results of student questionnaire

 Quotes and pie chart representation of the results of our questionnaire.

## 3. Activity

 Designed to be discussed and used in personal tutor sessions to help students improve their exam techniques.

## 4. Student interpretation of exam questions

How students believe marks are allocated in exams.

## 5. Technology

- Overview
- Downloading & Re-uploading submissions
- SpeedGrader & Panopto
- Wacom Tablets
- Explain Everything App
- Canvas Conference Feature

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#### What is good feedback?

Good feedback is a difficult term to define. With 'little consensus about what constitutes good quality external feedback' (Nicol and Macfarlane-Dick, 2006, pg. 208) it's no surprise that feedback is an area that always scores low on the NSSS (National Student Satisfaction Survey). After researching the principles of good feedback, we conducted a survey to see how they relate to the mathematics environment. From the results, we have put together this guide (along with a corresponding guide for students) with the aim of improving the quality of the feedback received by students in the School of Mathematics.

From Nicol and Macfarlane-Dick's (2006) seven principles of good feedback, we found that feedback needs to be timely and provide advice for improvement, as well as providing details on the works strengths/weaknesses. Timeliness is an area that the school performs well in, with 61.3% of the students questioned feeling feedback was delivered promptly; however, some students suggested they would have liked a little more detail to be provided.

"It's very quick feedback, especially compared to other subjects; however, I wish it was a little more detailed." (Third Year Student)

Self-assessment has benefits for both students and staff when used as a form of feedback. Integrated with staff feedback, it can help students identify and correct errors in their own work, which can help improve their performance in exams. If provided before staff marking, it can be used by staff to target their feedback to the areas that students are having difficulties with (Nicol and Macfarlane-Dick, 2006). Hence, this allows staff to provide detailed marking in the areas students want it most.

There are many ways that additional detail can be provided, without increasing workload. Robinson suggests offering guidance to students about how they should interpret and use the feedback they receive, so they can use it to maximum effect (our student guide would be a good starting point for guidance on how to use feedback). He also suggests getting students to see feedback as a dialogue so they feel more comfortable asking for help when they need it (in office hours or personal tutor sessions). This is also something students suggested themselves in response to our questionnaire, with one student saying:

"One of the problems with the problem sheet feedback in workbooks is that we don't know who wrote the feedback, and so, if I don't understand something in the notes I can't clarify what they were saying." (First Year Student)

Sometimes, how engaged a student will be with feedback is beyond control. 'For Draper (2009), only the subset of students who judge both that they need to improve and that their effort is adequate are likely to have a rational interest in the content of typical written feedback, and that may correspond to the subset who do pay attention to it.' (Evans, 2013, pg. 96) Hopefully, with the introduction of advice for students on how to use feedback, more students will actively engage with feedback. However, there will always be a small minority of students that require more encouragement to engage with feedback, and this could be where the use of technology in feedback could catch their interest.

From their research, Holmes and Papageorgiou (2009) suggest a misunderstanding of what constitutes feedback from students, compared to staff interpretations, could be the main reason students perceive the feedback they receive as poor. Their research also indicates a large variation in staff interpretations of feedback; this could be why students find it hard to



decipher what constitutes good feedback. Through this guide (and the corresponding student guide) we hope to bring student and staff interpretations of feedback more in line, with the hope that this will increase the effectiveness of feedback and eliminate any issues.

Here we offer our **top five tips** on how to provide good feedback:

- 1. **Be prompt** students work hard to meet deadlines and will appreciate it when you provide them with feedback quickly.
- 2. **Be clear** if students don't understand the feedback you provide they are unlikely to use it, making the whole process worthless for both them and yourself.
- 3. **Offer guidance** although students want to know what's right/wrong with their work, they also want to improve, and sometimes they require a nudge in the right direction.
- 4. **Offer encouragement** it's easy when marking large numbers of work to just tick the work that is correct and move on, however, a 'well done' or a smiley face can go a long way in boosting a student's self-esteem and giving them confidence when tackling unseen problems.

"Some markers would do a smiley face on the work where it was right which I found helpful." (First Year Student)

5. **Get students to actively engage with feedback** – the more engaged with feedback a student is, the more likely they are to put it to good use. Use of technology could be a great way of engaging students.

#### References

Nicol, D. & Macfarlane-Dick, D. (2006) Formative assessment and self-regulated learning: a model and seven principles of good feedback practice, *Studies in Higher Education*, 31(2). 199-218

Robinson M. Providing Effective Feedback. *Submitted book chapter in Transitions in Undergraduate Mathematics Education*, Edited by A.C. Croft, M.J. Grove, J. Kyle and D.A. Lawson, to be published by the Higher Education Academy

Evans, C. (2013) Making Sense of Assessment Feedback in Higher Education, *Review of Educational Research*, 83(1), 70-120

Holmes, K. & Papageorgiou, G. (2009) Good, bad and insufficient: Students' expectations, perceptions and uses of feedback, *Journal of Hospitality, Leisure, Sport & Tourism Education*, 8(1), 85-96

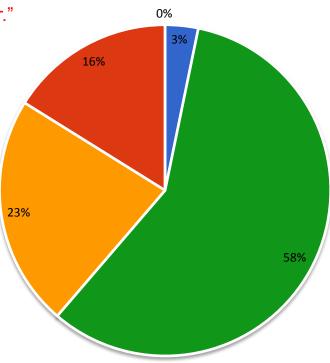


# What do you think of current feedback?

"The feedback provided on the homework books is poor."

"Generally, it's easy to ask members of staff for help, either in person or by email, when there's a particular question I'm finding hard. But I'd prefer it if I got feedback on every question I answered, rather than just those which are being marked."

"Comments on weekly problem sheets are vague, need to be explained better."



"For example, on the formative assessment sheets, our feedback generally consists of a few words at most. Plus, I believe that a lot of people receive very similar/the same feedback."

- Excellent
- Good
- Average
- Poor
- Very Poor

"In tutor I find that the tutor himself hasn't really looked at the question sheet and the markers on the homework aren't able to understand."

"We always had work marked, however only one question in each module, although I realize that is all time allowed for."

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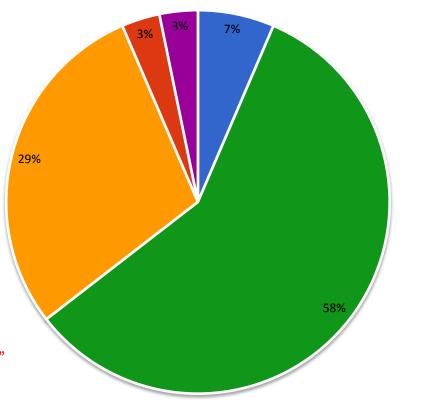
"When it has been given, feedback on work has often been detailed and including helpful explanations of errors I have made in the work"

"It helps when revising for the main exams."

"Some tells you how to improve, it depends who marks the weekly questions"

"It is not helpful at all."

# How helpful is the feedback?



"So I know whether I have done what is expected of me and to encourage me to do more."

"See if you need to work harder."

Good "Because it does
 Average everything I want it to."

Excellent

Very Poor

"It gives an idea as to what a 'good' answer to a question looks like."

"The advice is good at helping us see where we deviated or took a longer route to reach an answer. Personally, feedback is most helpful when it can identify the error, explain what caused the error and provide an optimal continuation (or full answer) for the question. Then, I can compare this to my own answer and develop an understanding of why I thought what I did originally and make sure to change that thought process."

"I focus more on the parts I didn't do so well on"

"I don't use feedback to help with further study because I feel that I'd be overworked if I did further study."

"By reading it and adapting to where it indicates there exist errors"

"It gives me a better understanding of how to approach questions."

# How do you use feedback to aid further study? "Juse it short term to understand"

study?

"Try to correct my work & follow any advice given."

where improvements could've been made on that particular piece of work. Long term I keep it in mind so that I don't make the same errors again."

"The feedback highlights the areas that I am deficient in, so that I can focus those better when revising"

"Know which questions have gone wrong, and needed to be looked at again."



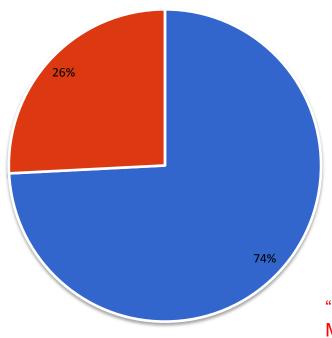
"I always would rather the feedback focused more on where I was having problem than on the things I felt I could already do."

> "Just a tick and a zero and possibly a 'well done' is all that is given when something is right."

"You know when you are right as they give you a zero. However if it is like half right and they give you a 1 then it can be hard to understand what you need to improve on"

"If you get something right, they tend to not tell you anything about it. In my opinion, I would worry more about when something is wrong and the feedback given is poor." "Often if something is done right we just get a tick. It would be good to see what parts of the question the lecturer is looking more closely at and where marks come from, as well as some encouraging comments!"

# Is enough feedback given when you get something right?



"Don't exactly need a lot of feedback if something is right to be honest. Would much rather get decent feedback when something is wrong."

YesNo

"For computer science yes, for Maths no because they tell us the right answer but they dot explain yours wasn't perfect"

"When you get something right & there is nothing to correct a tick or full marks suffices."

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# Activity

The purpose of this activity is to allow students to see the process yourself and post-grads go through when marking their work. This will hopefully give them a better understanding of expectations and will allow them to improve their work and understand the feedback you provide.

There are 10 questions for students to look at and attempt. They vary in difficulty from past A level questions, to past homework/additional exercises, to past final exam questions (included for second years).

There are also model solutions and mark schemes to be handed out to students. The hope is that these will emphasise the importance of presentation in a students work, and, help eliminate the gap between student and staff expectations.

Next there are examples of a student's interpretation of how marks are allocated for the final exam questions. In red is the student's opinion on how marks should be allocated and where, before they know how many marks the question is worth. In blue are the student's thoughts on where marks would be achieved once they know the how many marks the question is worth.

Why do you think students over-estimate the amount of marks a question is worth? Are there any suggestions you can give to students to help them understand how and where marks are achieved?



9.

(a) Write the complex number z in the form p+qi where  $p,q\in\mathbb{R}$  with



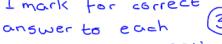
$$z = \frac{3 - 2i}{1 + 2i}.$$

for correct answer

(b) Given the complex number z = -2 - 2i,



(i) write z in modulus-argument form and in exponential form, using the principal value of the argument,  $\frac{1}{2} \frac{1}{2} \frac$ 



(ii) sketch z on the Argand diagram,

sub-question

- (iii) calculate  $z^4$  and write it in the form p+q i where  $p,q \in \mathbb{R}$ .
- (c) Find graphically the solutions to the inequalities



(i) |z-2+2i| < 2,  $\longrightarrow$  1 mark; for correct graph



(ii)  $2|2-2i-z| \geq 2$ . I mark; method & graph

[13]

Hence, solve the combined inequality  $|z-2+2i| < 2 \le 2|2-2i-z|$ .

[8]

> 1 mark; for correct

- 7a) I mark for method, I mark for correct answer
  - bi) I mark modulus-arguement, I mark exponential form
  - ii) I mark for good sketch
- iii) I mark for method, I mark for p. I mark for q
  - ci) I mark for method, I mark for graph
  - ii) 1 mark for method, 1 mark for graph
  - ... I mark for combining correctly

A29812 No Calculator

10.

(4)

(a) Consider the n by n matrix  $\mathbf{Q}$  which is obtained from the n by n matrix  $\mathbf{A}$  by multiplying the second row in  $\mathbf{A}$  by a real number  $\lambda$ . Prove that

$$det(\mathbf{Q}) = \lambda \det(\mathbf{A}).$$

$$1 \max_{\mathbf{A}} |\mathbf{Q}|$$

$$1 \max_{\mathbf{A}} \max_{\mathbf{A}} \min_{\mathbf{A}} udbon[3]$$

(b) Use Cramer's rule to determine the value of q where (p,q,r) is the solution of the system of linear equations

(5) 
$$\begin{cases} -3y + 2z = 2, & 1 \text{ mark } |A_1| \\ -y + 3z = -1, & 1 \text{ mark } |A_2| \\ -x - y + 5z = -1. & 1 \text{ mark } |A_2| / |A_1| \end{cases}$$

Do not calculate either of the components p or r.

1 mark definition

multiplication

(c) Let V and W be two (not necessarily distinct) real vector spaces and let  $T:V\to W$  be a 1 mark linear transformation. Define the image of T and prove that it is a subspace of W. [3] addition

(d) Let  $T: \mathbb{R}^2 \to \mathbb{R}^3$  be the linear transformation given by the rule

$$T(x,y) = (2x - y, 3y, 2y - 3x).$$

(i) Find the matrix **A** that represents T relative to the ordered bases (2) 1 mark per

(2)  $B = \{(1,1),(0,1)\}$  and  $B' = \{(1,0,0),(1,-1,0),(1,1,1)\}$  of  $\mathbb{R}^2$  and  $\mathbb{R}^3$ , respectively.

(3) (ii) Determine the rank of T. (2) 1 mark row operations; 1 mark correct rank

(3) (iii) Determine the kernel,  $\ker(T)$ , and the image,  $\operatorname{im}(T)$ . 1 mark  $\ker(T)$ ; 1 mark  $\operatorname{im}(T)$ 

(3) (iv) Find a basis of im(T) and determine the nullity of T. 1 mark basis; 1 mark [8] nullity

[23]

- a) I mark for IAI; I mark for IQI; 2 marks for manipulation to get XIAI=1QI
- b) 2 marks for IAI; 2 marks for IA21; 1 mark for IA21/IAI
- c) I mark for definition; I mark closed under addition; I mark closed under scalar multiplication
- di) I mark per correct co-ordinates of (1,1) & (0,1) in R3
- ii) 2 marks for row operations; I mark correct answer Page 10

iii) I mark for ker(T); I mark Im(T); I mark working out

iv) I mark basis; I mark nullity; I marking working

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# Technology

There are many ways technology can be used to help improve feedback. Some provide the opportunity to give more in depth feedback, others allow for faster marking, and some allow for the demonstration of a thought process as well as methodology.

Technology available can be used to give feedback or to construct worked examples that can be used by students to gain a better understanding of a topic. The technology that could be used varies from apps, to software, to tablets.

Next we detail some of the different technologies available and how they can be used to aid feedback.

#### Different pieces of technology you can use to give feedback:

**Screencasting** is a tool that allows you to record your computer screen as well as record your voice. This allows you to commentate on what is being shown on the screen. This will be beneficial, for example, when showing a worked example as it will allow you to talk indepth about what happens between each and every step of the working. Below we detail some of the best options for screencasting:

**Panopto** is integrated into, and free to use via Canvas. It allows you to record multiple screens or devices to produce a full and detailed video. All videos are uploaded to the server via Canvas, where they are easily accessible to students. There is a detailed guide explaining how to get started with Panopto provided.

**Explain everything** is an app that works across platforms. You record an interactive whiteboard, allowing you to work through an example thoroughly. The app is very easy to use and easy to learn how to use. We found that the app is the best of its kind and can be very useful to create worked examples. We have created a video on how to use this app that can be accessed via a hyperlink in this document.

**Camtasia** is software which allows you to record your computer screen, as well as record your voice, so you can create explanatory videos to give to the students via an mp4 file through Canvas. It is very easy to use as it comes with a video tutorial and is very user friendly.

**SpeedGrader** is an Instructure built app that is built into the Canvas website and can be accessed on Apple devices as an app. It easy to use and allows you to give feedback fairly quickly, however, on an Apple device you cannot annotate the work that is submitted. However, this is possible on SpeedGrader when accessed on an Internet browser.

The **Canvas Conference Feature** is a built in app within Canvas. It allows you to share your screen and have video conferences with students who can upload a file (PDF document, PowerPoint presentation etc), that you can then view and annotate using the pen facilities. We found this feature has lots of potential to work well when giving feedback. We have created a video, which is available via hyperlink, that explains how to use the conference feature. As the conference is in real time you can discuss the feedback you just gave to your student, allowing you to make sure that they understand.

The **Wacom touch and pen graphics tablet** can be linked with software such as PDF-XChange Viewer (free to download). It allows you to write and comment on the PDF document containing your students' work and then send it back to them by uploading it on Canvas. At first it is a bit tricky to use the tablet for writing, but if you trace over an image then it allows you to quickly become co-ordinated when using the tablet for on-screen writing.

You can **download and re-upload** students' submissions in Canvas easily. There is a button that can be used to download all the submissions in one .zip file. After annotating and saving over the student's submission, you can re-upload the .zip file and Canvas will automatically assign the correct feedback document to the appropriate student.

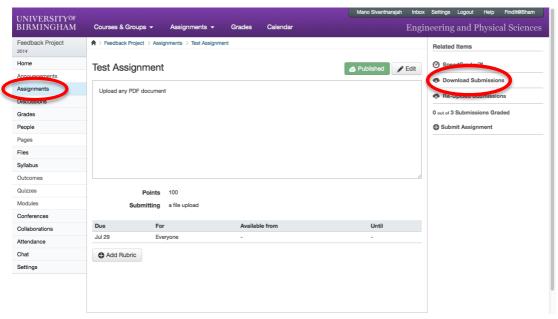
The **Live Scribe pen**, when used alongside the special Live Scribe Paper, allows you to convert your writing into a PDF document which can be then shared on Canvas for the students to see. The pen also has a built in voice recorder allowing pencasts (similar to screencasts) to be made. With the latest version of Adobe Reader these can be viewed straight from the PDF format.



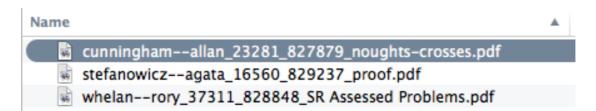
#### **Downloading and Re-uploading student work**

Canvas has a great feature where by it allows your download all student submissions at the same time, then mark/annotate them, and then re-upload them together for students to see.

You simply go to the "assignments" then select "Download submissions".



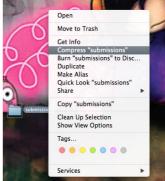
After you download the file, it will compress them into a zip file or just simply download it as a folder containing the submitted files (depending on your operating system). Canvas automatically renames the files with the student's names in front of the document title:



#### For Mac devices

After you annotate/edit the files, simply save over the document, without changing the name. Then you have to compress the folder that contains the files in order for you to re-upload it.

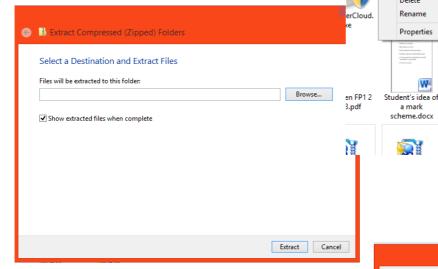
(If you have trouble with "read-only" documents follow advice for windows users)



# For Windows devices

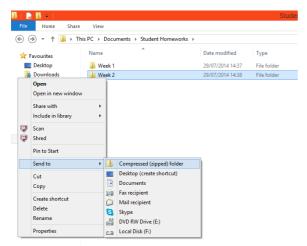
The files will come down in a .zip file in your downloads folder. Right click on the file and select the "Extract All" option

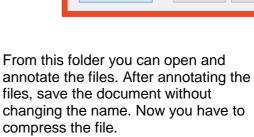
The following text box will appear. Browse files to find the location you wish to extract files to.



We suggest you have a specific file set up beforehand that documents can be extracted to. and create a new folder within it for each new assessment or homework extracted. This can be done whilst extracting the files.

Once you have selected your destination, click extract. The folder containing the files will open automatically.





Open

Scan

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Extract All...

Pin to Start Open with Share with

Cut

Copy Create shortcut Delete

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Select a destination Select the place where you want to extract the selected

item(s) to. Then click the OK button.

PC Cleaner Student Homeworks

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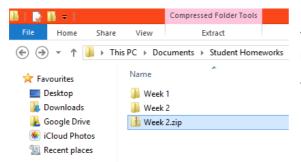
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Supporting Documentation.p

Right click on the file that contains the annotated work. Hover over the "Send to" option and select "Compressed (zipped) folder".







This will produce a folder of the same name ending .zip.

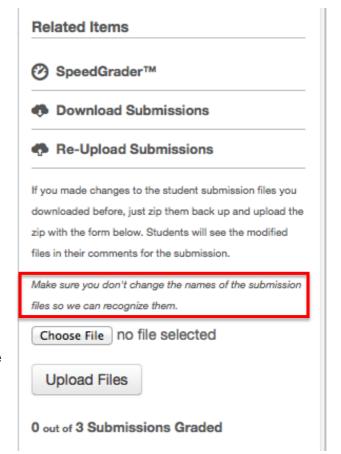
This is the folder you will need to reupload.

#### For all devices

Now go onto the "assignments" page and click on "re-upload submissions".

You then simply choose the zip file you created and click on "Upload Files". This then automatically sends the new annotated PDF to the correct student who submitted it.

It is important you do not change the name of the file when saving it after annotation, as its name allows Canvas to reassign the correct feedback to the relevant student automatically.

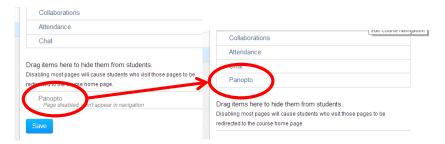




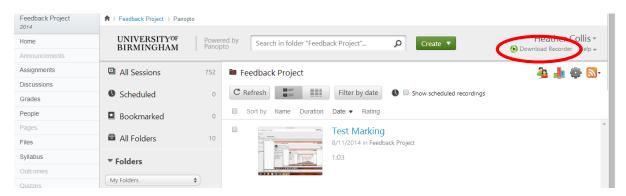
#### Using SpeedGrader and Panopto to provide Feedback

#### Set-up:

Access your settings on Canvas. In the navigation section drag and drop the Panopto symbol to the desired location. This will activate Panopto for everyone on the course.



Now go to the Panopto tab on Canvas. From here you can download the Panopto Recorder.



You will then be given the option to download the recorder for the relevant operating system.



Once you have downloaded the recorder, the login page will appear. You can easily login via Canvas. (This picture is of the windows login page, Mac looks different but the same principles apply.)



SpeedGrader does not require set-up, it works automatically within an assignment; however, there is an app available for Apple products that you may wish to use.

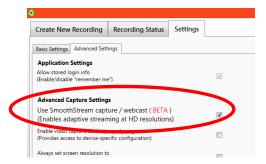


#### Optimising Panopto:

Open the Panopto recorder and go to the settings menu.



In the advanced settings, make sure SmoothStream capture is turned on. Panopto will not capture real-time writing unless this is activated.



Using the source controls you can adjust which screens and devices you wish to be used to create your screencast.



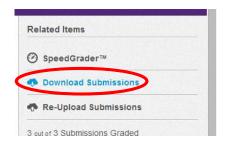
We suggest increasing the frame rate to the maximum for better quality videos.



#### Providing Feedback:

Now Panopto is set-up you are ready to start recording work.

Group download students work from the assignments page.





Make sure you have all the relevant screens and equipment open and ready to use. Press record on the Panopto recorder and open the student's document you wish to mark. Your screen will now be recorded. Mark the work using your preferred method and equipment.

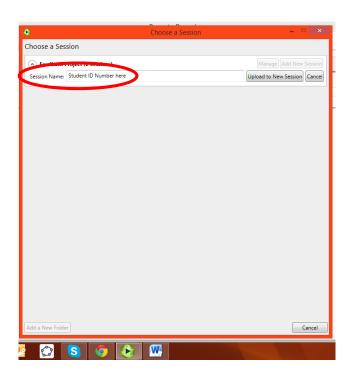


Once you have finished recording press stop. The following screen will appear. From here, press the "upload to server" button.



You will be uploading to a course specifically for creating Panopto feedback so that students work and marks remain private.

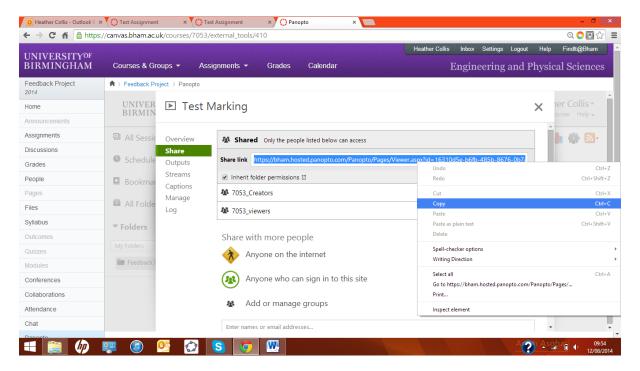
Select the folder you wish to upload to, and then name the session with the students name (should be written at the top of their work). You may also wish to include the week number as well.



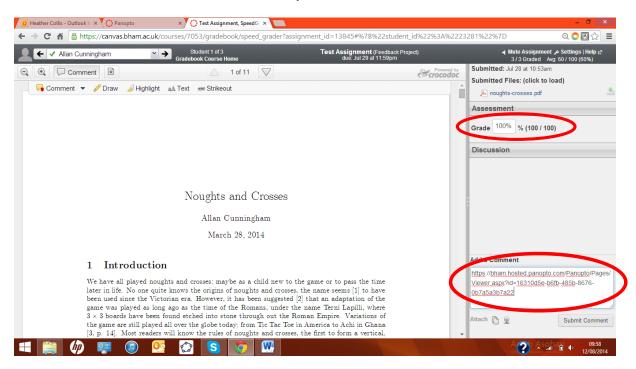
The file will then be uploaded to the Panopto folder on Canvas. From this folder select a student's video and press the share button. This will create a link that can be used to share the video with the student.



#### Copy the link.



Now go to the student's work within SpeedGrader; this is where you can input the student's mark. Also paste the link to the student's video in as a comment in the discussion. This will allow the student to access their video easily via the link within Canvas.



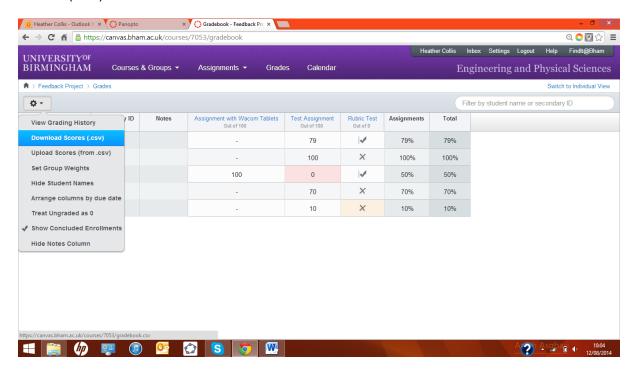
#### Downloading student marks

When you have finished marking students' work, you can easily download a spreadsheet of their grades from the Gradebook (which is accessible via the "grades" tab or SpeedGrader).

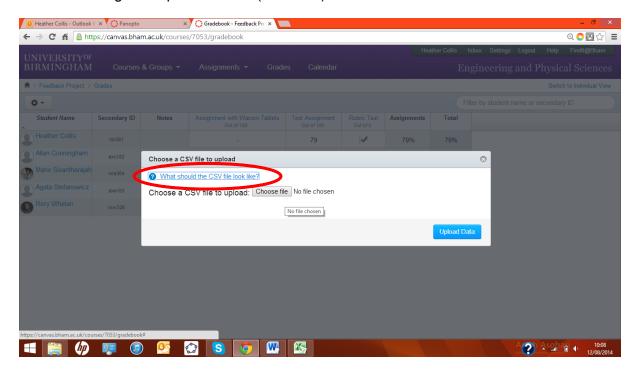




In the gradebook select the settings icon. From the drop-down menu select the "Download Scores (.csv)" button.



This will download an excel document that will contain the students marks that can be formatted and edited. If you do change a mark on the excel sheet you can re-upload the document using the "Upload Scores (from .csv)" button.



From here, you can select the file containing the grades to re-upload. As long as the file still matches the recognisable format (which can be found by pressing the link circled above) the marks will automatically be assigned back to the correct students and changed for you on Canvas.



#### Wacom – Intuos Pen & Touch Tablet

Using the graphics tablet is really useful and easy to get to grips with. This is a short guide on how to get set up and a few tips on how to make the most of the tablet.

In the box you get 4 essential things; the tablet, smart pen, a USB cable and an installation CD.

Getting set up is really easy and takes no more than a few minutes. The tablet is compatible with both Windows and Mac. You simply plug the tablet into the computer, using the USB cable, then insert the CD into the CD drive and follow the on screen information, and with a few clicks you are ready to use the tablet.

Both the tablet and pen are easily configurable by going onto your control panel or system preferences on respective Windows and Apple devices. The tablet, **without** the pen, can be

used as a multi-gestural track pad, which is again customisable and also had 4 buttons at the top of the tablet (See picture – red box) which you can assign functions to, such as, right click, left click, shift etc.

The pen has the nib, which you write with, and an eraser tool on the opposite end, however, this eraser tool does not work with all software so be wary of this. The pen also has two buttons which again can be assigned to a function such as right and left click, or can be disabled completely depending on your preference.





Black lines have been traced on

At first writing with the tablet can be tricky, but a great way to improve your hand-eye coordination is to spend some time drawing with the tablet. Tracing over a picture that has detail helps you develop your hand-eye coordination quickly as well (See picture – skull).

We found that PDF-XChange Viewer is the best software to use when annotating work submitted by students. PowerPoint also has good annotating features available in presentation mode. When practising with the tablet, we suggest using a program such as paint, which has simple drawing features, as this will allow you to focus on improving your hand-eye co-ordination.

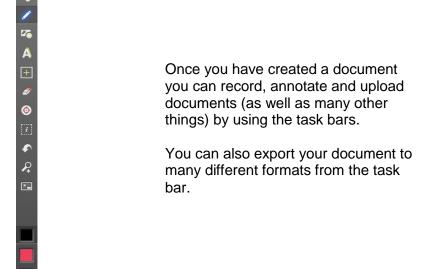
#### **Explain Everything App**

In Explain Everything you can create a document from scratch or use an image as a starting point. You can store your files in folders and the app creates a back-up folder if you use the app and fail to save your progress.





In the settings you can manage how Explain Everything exports your files and the quality it records at, as well as more general features like the pen type and configuring the app with a stylus. You can also manage your account details here.



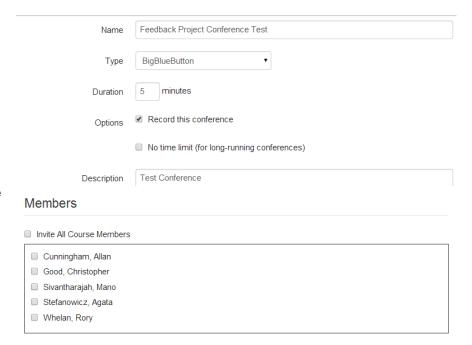


#### **Canvas Conference Feature**

To create a conference, first go to the conference section of the relevant course page. Then select the New Conference button.



You will be shown the following pop-up box. Here you can edit the settings of your conference, i.e. how long it will last, will it record, who will be able to access it. Then press the update button.



You will be taken back to the conference page where you can start the conference.

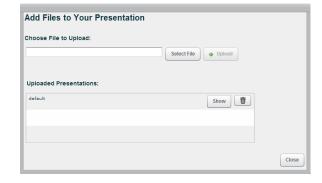


The conference will open in a new tab.



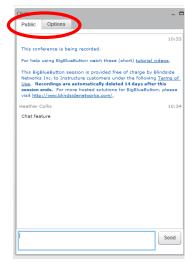
You will be asked to configure your audio settings and join the audio for the conference.

You can upload a file (or students can upload a file) to be discussed during the conference.





There is a typed chat feature that can be used alongside the audio features. You can send a message to the whole group (public) or privately to individual members.

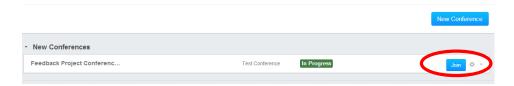




You will automatically be the presenter for the conference. This means you can annotate the documents being discussed. You can authorise a student to be a presenter during the conference for a period of time so they can highlight where they are having difficulties. A hand image may appear next to a student's name; this is the equivalent of them raising their hand in a lecture. Once you have spoken to them, you can lower their hand by clicking on the symbol.



You can return to a conference once you have left it whilst it is still in session. (Students cannot join a conference until you have started it).



Once the conference has finished you (and students) can access any recordings made for the next 14 days.



For more detailed advice on how to use the conference feature, please watch our explanatory video.

