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## PTAS Project Report (for REGULAR PROJECT GRANTS)

**Project Title:** Learning glass: evaluating its use by teachers and students for enhancing learning experience

**Project type:** B-Innovation Project

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## Report

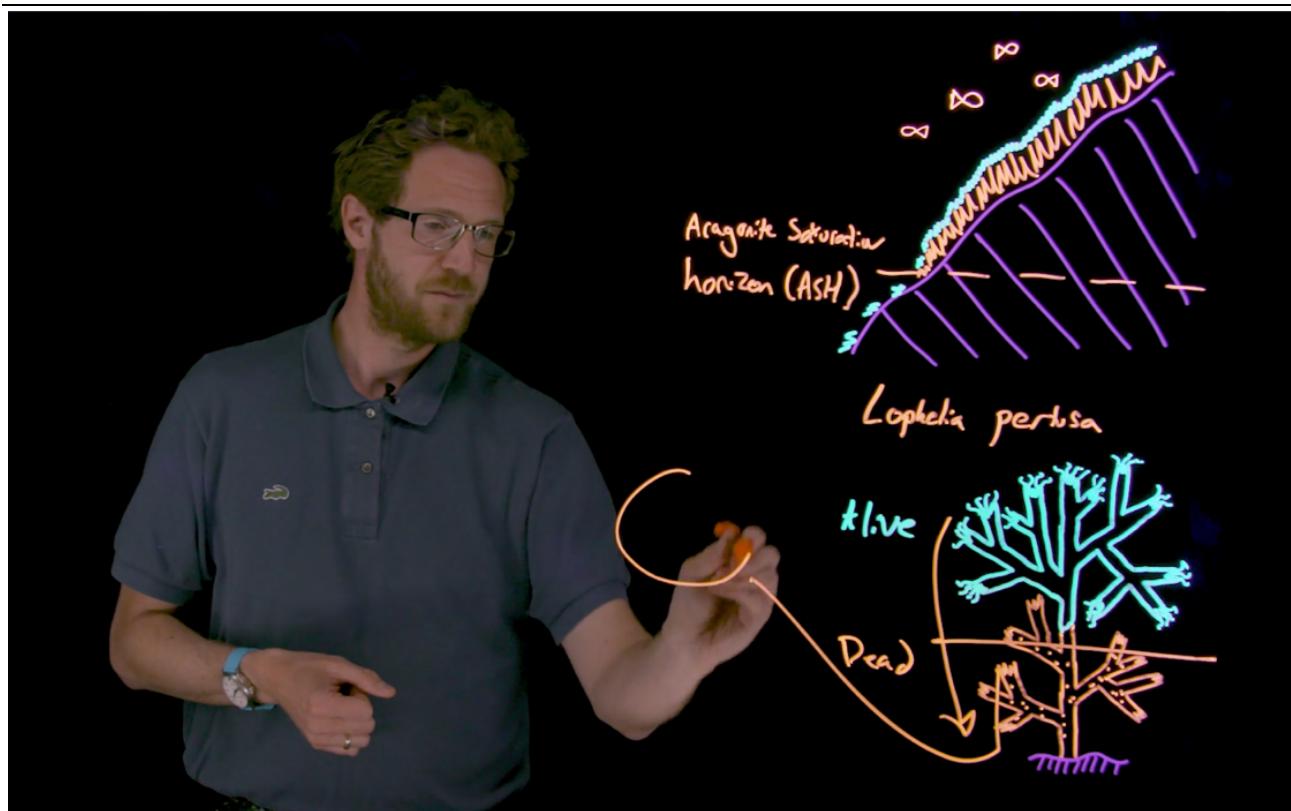
### What did you do?

As training prior to using Learning Glass technology, presenters in the GeoSciences team attended webinars on content creation, and also on how to deliver content effectively using Learning Glass. Following these webinars, the group decided upon 2 lecture concepts that would make suitable content for students. These two topics were on 1) coral bleaching, and 2) the impact of ocean acidification on cold-water coral reefs. Delivery of these topics were practiced on white boards prior to filming to optimise what content could be 'pre-drawn', and what could be drawn during filming.

Once content was refined, both videos were recorded ready for class delivery (Figure 1). Videos (EASE protected) of both lectures are available in the links below. A transcript is also posted in the comments section of the second video to make the content more accessible.

Coral bleaching [https://media.ed.ac.uk/media/t/1\\_6szq4kau](https://media.ed.ac.uk/media/t/1_6szq4kau)

Ocean acidification and cold-water corals [https://media.ed.ac.uk/media/t/1\\_u2ogzpvh](https://media.ed.ac.uk/media/t/1_u2ogzpvh)



**Figure 1:** Image of one of the lectures using Learning Glass, where the presenter faces the camera directly, and can annotate the board in front them while speaking

Prior to delivery of the Learning Glass lectures to MSc classes, students filled out a survey to 1) assess the clarity of content through PowerPoint, and 2) subsequent knowledge retention a few months later. This process was repeated with the Learning Glass Lectures.

Clarity of the coral bleaching content was assessed through 5 questions (Table 1), with a 'agreement score' ranging from 1 (strongly disagree) to 5 (strongly agree). Freeform comments were also collected.

**Table 1:** Questions posed to students to assess content delivery of PowerPoint slides and Learning Glass

1. I feel confident in my understanding of coral bleaching
2. The slides/media used in the presentation were clear
3. The material presented was easy to follow
4. The use of visuals in the presentation helped my understanding
5. The material was accessible

Additional surveys were taken by the students 3 months after delivery of content to assess retention of knowledge. To assess this, students were asked to score out of 5 (1= strongly disagree, to 5 = strongly agree), whether they understood the process of coral bleaching.



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They were then asked to summarize what coral bleaching was and whether corals could recover. These answers were scored by the presenter from 1-5. Following presentation of Learning Glass videos, they were posted on course Learn pages as an online resource.

Learning Glass was also trialled as a learning tool for students with regard to summarising their own work.

For Undergraduates, a research team used the technology to prepare a short video to describe themselves and their work.

[https://media.ed.ac.uk/media/t/1\\_30eu9abz](https://media.ed.ac.uk/media/t/1_30eu9abz)

At MSc level, a student trialled the technology to present her dissertation work as an alternative to the typical PowerPoint assessment.

[https://media.ed.ac.uk/media/Measuring+Water+basin+stress/1\\_t4qvgwmx](https://media.ed.ac.uk/media/Measuring+Water+basin+stress/1_t4qvgwmx)

At PhD Level, a student trialled the technology to summarise their PhD and the scope of their anticipated work.

[https://media.ed.ac.uk/media/t/1\\_zj9pi8pu](https://media.ed.ac.uk/media/t/1_zj9pi8pu)

### **What did you find out?**

*For lecture material:* From learning about this technology and trialling its use in my classes, I have learnt that it is a valuable *addition* to existing lecture content in terms of increasing conceptual knowledge, but not as a replacement for existing material at present within my courses. Playing the Learning Glass content in class gave us the opportunity to discuss the content presented in a different context. The general perception in freeform comments was that its use was very welcome. In follow up discussion with the class, they felt that it was 1) a great resource for pre-lecture reading, 2) for topic revision following the lecture, and 3) for a discussion session around complex topics during the lecture. The students found re-watching the video after the lecture as more fun than re-watching whole recorded lectures. As the videos were short and only covered specific contents, students found it fun to watch and easy to assimilate knowledge from.

Comments following the video were positive and highlighted its use as an additional accessible resource for teaching and student learning.

*“Think this would be a very useful resource - excellent understanding very quickly”*

*“Visuals give a good understanding of process”*

*“Really great - does not replace in person teaching but a great tool for reference”*

*“Very good resource for revision”*

*“Makes materials extremely accessible. However, dependent on presenter”*

*“Useful as accessible addition to re-watch at own pace”*



*"Allows for clear step by step explanation"*

*"Good for short videos"*

*"Great for teaching and online resources"*

*"Great supplement to lectures, not in place of"*

*"Excellent to have as pre-reading or in lecture for discussion aid and break"*

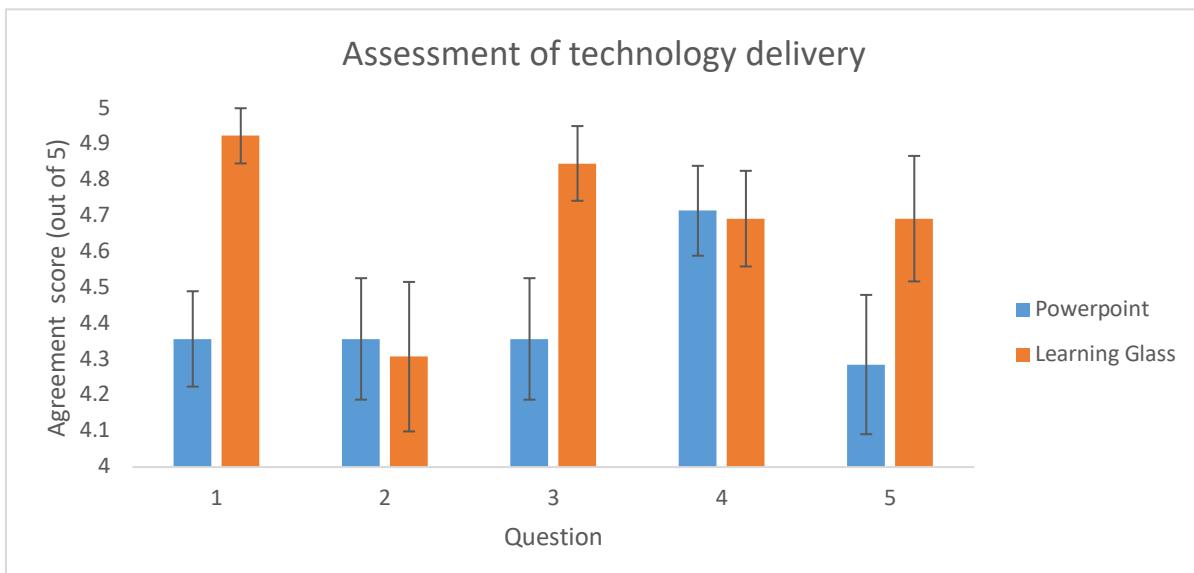
As a technology to be used by students, comments included:

*"Would be great for formative assessment"*

*"Another tool for us to use in the real world"*

*"Very good alternative to giving an assessed PowerPoint presentation"*

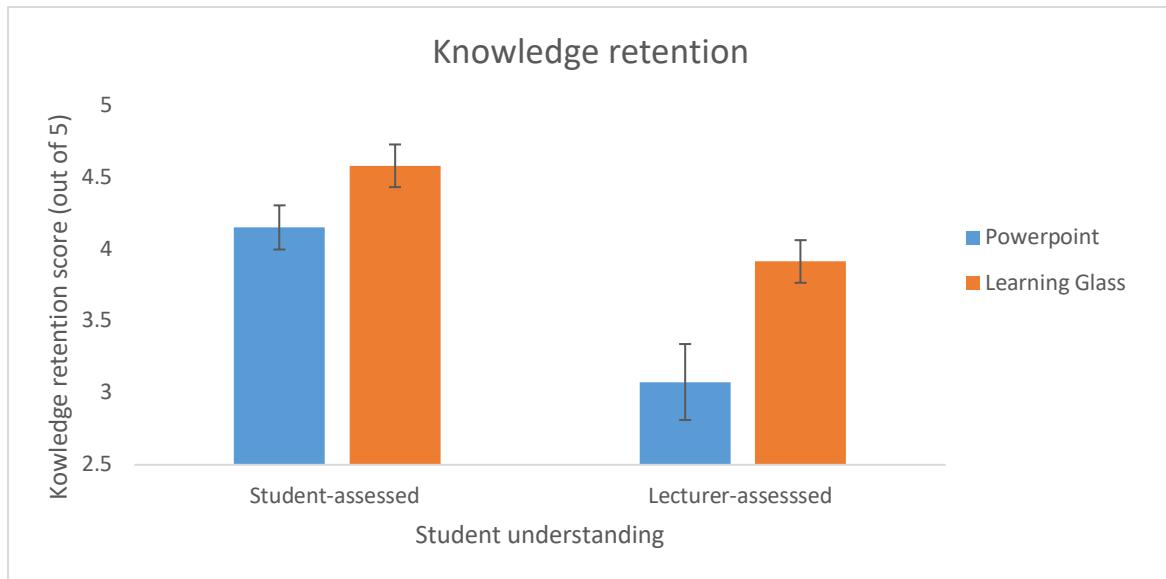
Results relating to content clarity were interesting - In general, scores were high for both methods of content delivery, with Learning Glass having higher scores for questions 1, 3 and 5, relating to content understanding, the ease of following it, and its accessibility (Table 1, Figure 2). Both technology types scored similarly for how clear the slides/media was, and that visuals were as good aid to understanding.



**Figure 2:** Student agreement scores from 1 (strongly disagree) to 5 (strongly agree) for 5 questions (Table 1) asked with regard to the content of coral bleaching lectures delivered through PowerPoint and Learning Glass. N = 14 (S.E).



With regard to knowledge retention, Learning Glass derived knowledge was retained better over the same timescale as content delivered through PowerPoint (Figure 3). This was consistent with both student assessed knowledge retention, and Lecturer assessment of written answers.



**Figure 3:** Student agreement scores from 1 (strongly disagree) to 5 (strongly agree) with regard to knowledge retention from content delivery from PowerPoint and Learning Glass lectures. This was assessed by the student (do you agree with the statement, “I understand the process of coral bleaching”) and by the presenter following written responses of the students describing the bleaching process. N = 14 (S.E).

With regard to a tool for student assessment, the trial worked well, with the student who did the video reporting that it was a very good exercise to simplify their topic in a fun way. The student enjoyed the experience, but there is significant time taken to prepare for, and then undertake the recording. As an assessment, this remains a key concept to explore. To be integrated as an assessment tool, a training programme for the students would have to be built into the course. In terms of the skills the students learnt, they found that they developed their skills in summarising complex issues into visually appealing media. As such, this would not only be useful for student assessment, but as a skill for students to gain and as an output they could show to potential future employers or on their social media for outreach.

#### **How did you disseminate your findings?**

Dissemination to date has been internal, but two outputs will be 1) a pedagogical manuscript assessing the use of Learning Glass in a non-equation-based format, and 2) a Teaching Matters blogpost once the article is published, to showcase the potential of the technology of Learning Glass for teaching and learning.



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### **What have been the benefits to student learning?**

Benefits to the students have included greater retention of conceptual knowledge, and an extra online resource for them to revise from in preparation for assessments. With regard to the students that used the technology for a mock assessment or for summarise their project work, a key benefit was learning key skills in summarising complex content, delivering this content in a media friendly way, and in public engagement.

### **How could these benefits be extended to other parts of the university?**

There are a number of ways this technology could be used to benefit the wider university. Currently, one setup of the equipment exists. However, an additional setup elsewhere in the university (e.g. KB) would open up new possibilities and availability.

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1. Lecture content: The lectures we made and trialled were received well by the students and had demonstrated learning benefits to them. These could be incorporated into other programmes in other schools for in-class work and as on online resources.
  2. Distance learning: the format of the recordings, where the presenter is facing the camera, is suited well for distance learning content. With the current situation and a move to more digital teaching delivery for the next academic year, Learning Glass has been discussed as a key teaching tool and a large number of colleagues will be interested to know more about these types of technologies.
  3. Student assessment. We trialled the use of technology for this and it was successful. Not only is it an assessment that will equip students with new skills, but would be a resource for them to demonstrate proficiency in presentation for future employers.
  4. Summarising complex ideas into short videos that are visually compelling is a skillset that many students would be able to use for future employment.
  5. Public engagement. The PhD and UG students partially made their video with public engagement in mind, as it is a compelling narrative of their work. The technology could be used to create content for public engagement events.
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### **Financial statement:**

This project has utilised the funding awarded to it by the PTAS adjudication committee and the Principal Investigator or School Administrator appropriate can provide financial statements showing the funding usage as and when required by the UoE Development Trusts who may require it for auditing purposes.

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