

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



Project title

Cultivating student led tutorials - The effects of a flipped online classroom.



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

'Tell me and I forget. Teach me and I remember. Involve me and I learn.'

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



Intention

The objective of this small-scale study was to create a tutor free, active learning environment where students feel at ease to discuss and work on skill-based problems together.



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

'Tell me and I forget. Teach me and I remember. Involve me and I learn.'

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

How did we create a fun, relaxed space?

Pre tutorial activities for example:

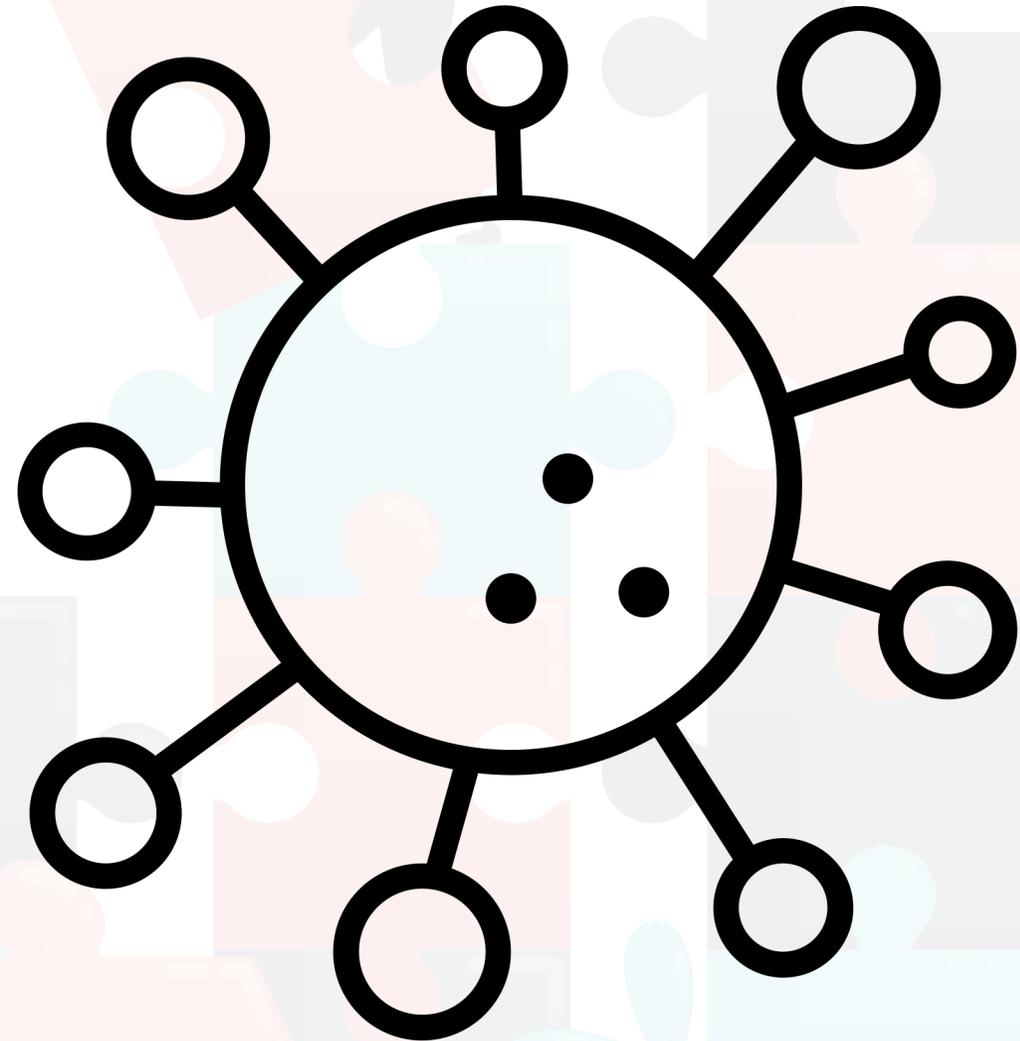
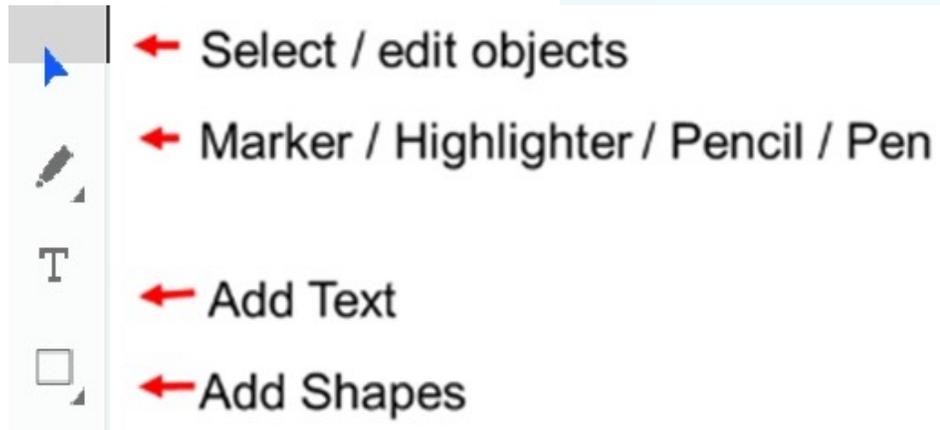
1. Positive quotes
2. Drawing activities
3. Quizzes
4. Dingbats



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Activity 1: Decorate the virus using the draw tools.



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Activity 2: Drag the disease to the year they were discovered.

Measles

HIV

Hepatitis C



Ebola

Cholera

Tuberculosis

1882

1989

1981

1976

1854

1757



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Activity 3: Dingbats - chemical elements



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Now it's your turn to try a welcome activity...

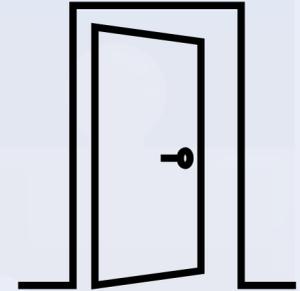
You will be assigned a break out room.

An introduction task awaits you in your break out room.

Once in your room please **select one person** as spokes person for the plenary.

You will be provided with a link to a padlet board for comments.

This activity is a taster for you to try and will be approximately 5 minutes.



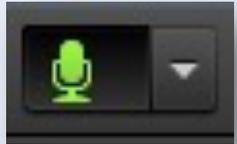
The pictures and letters are hyperlinked



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Reminders



Microphone use

Click to make mic green and active
You can now talk 😊



Click again to turn it off

Draw tools



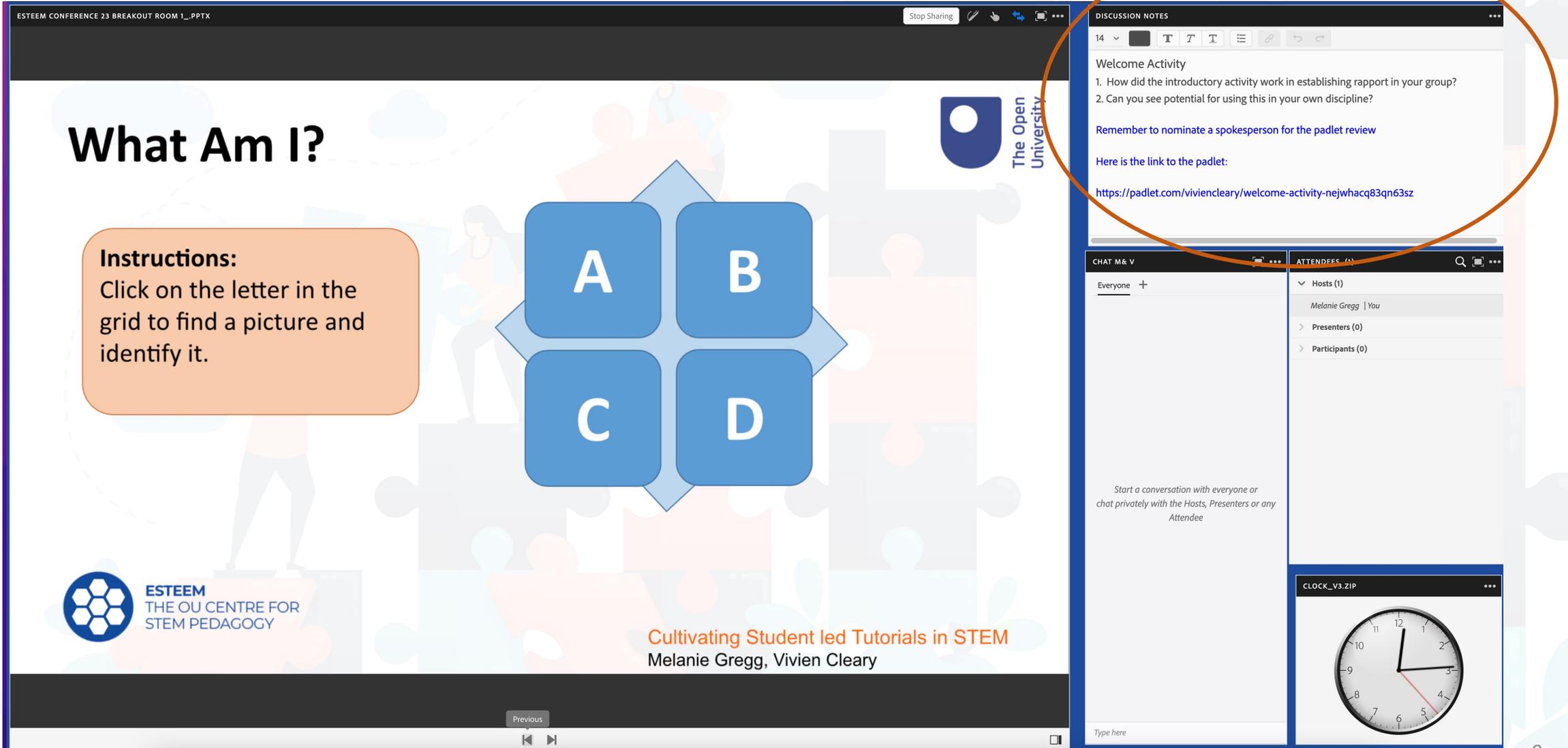
Action button -
press to go to
previous slide

Action
button -
press to
go to next
slide



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



The screenshot displays a Zoom meeting interface. The main window shows a presentation slide titled "What Am I?". The slide content includes:

- Instructions:** Click on the letter in the grid to find a picture and identify it.
- A 2x2 grid of blue squares labeled **A**, **B**, **C**, and **D**.
- Logo for **ESTEEM THE OU CENTRE FOR STEM PEDAGOGY**.
- Footer text: **Cultivating Student led Tutorials in STEM** by Melanie Gregg, Vivien Cleary.

Overlaid on the right side of the Zoom window is a **DISCUSSION NOTES** panel, which is circled in orange. It contains the following text:

- 14
- Welcome Activity
- 1. How did the introductory activity work in establishing rapport in your group?
- 2. Can you see potential for using this in your own discipline?
- Remember to nominate a spokesperson for the padlet review
- Here is the link to the padlet:
- <https://padlet.com/vivienleary/welcome-activity-nejwhacq83qn63sz>

Below the notes panel, the Zoom interface shows a **CHAT M&V** window with a "Type here" input field and an **ATTENDEES** list on the right. The attendees list includes:

- Hosts (1): Melanie Gregg | You
- Presenters (0)
- Participants (0)

A **CLOCK_V3.ZIP** window is also visible in the bottom right corner, showing a digital clock.

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

:Padlet

viviencleary • 7d

 **Welcome Activity**

How did the introductory activity work in establishing rapport in your group?

Group x

The exercise was easy but it got us talking.

♡ 1 💬 0





Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



Each breakout room has a set of pictures to identify.

As a group discuss what you think they are and the link between them.

You will be given 5 minutes for this task.

And then a reminder for the spokes person to complete the padlet board.

The remaining attendees can click on the padlet board hearts to agree.



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

ESTEEM-CO eSTeEM and Co. On... ▾



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Data collection

1. Breakout room tasks designed and launched in four Tutor groups.
2. Online survey was issued post tutorial on 5 occasions.
3. End of module general survey issued to ALL students in the 4 groups.
4. Post exam 20 minute Interview carried out with 8 students.



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

How did we create appropriate tasks?

Ensuring it challenged up to date students but could also be attempted by those that had fallen behind

We considered:

1. Previous students' misunderstandings and difficulties.
2. Skills required for upcoming TMAs.
3. Increasing the complexity as year progressed.
4. Allowing enough time to complete task with a little extra to chat.

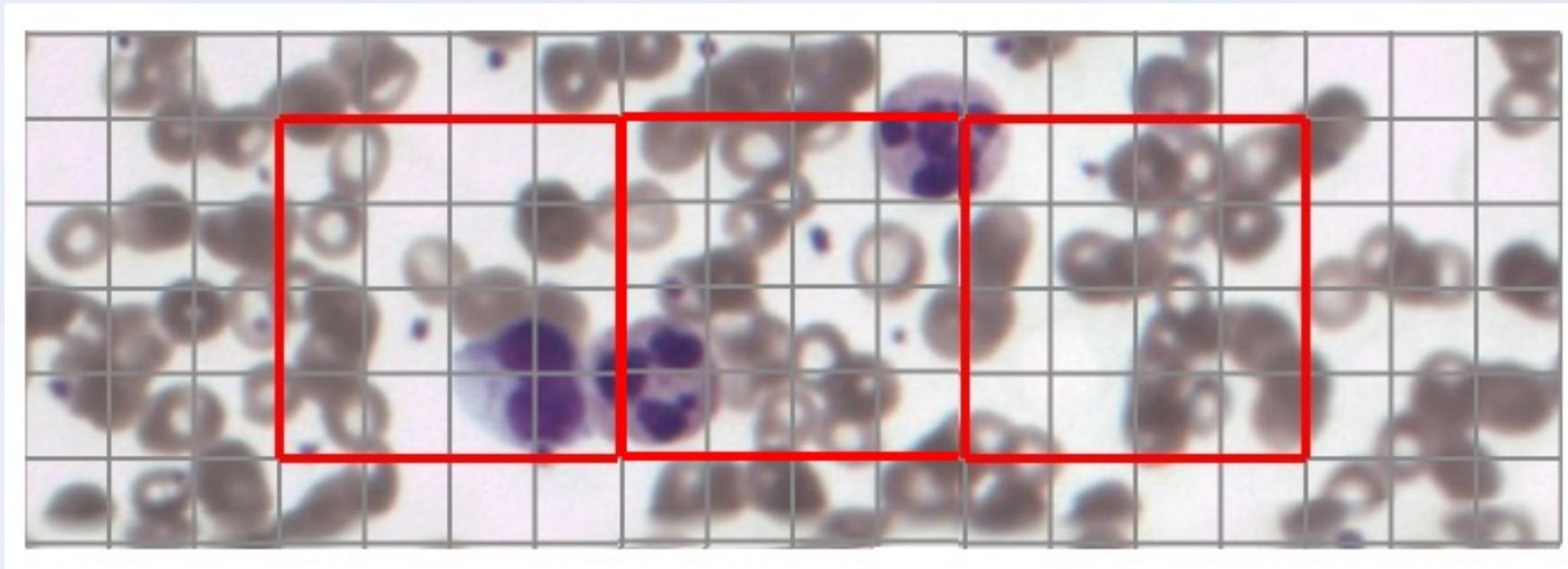


Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

The Breakout room activity: example 1

Using the digital microscope



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

The Open University (2020). Infectious Diseases. Section 7.4.5 Counting leukocytes in blood samples. *SDK100: Science and Health*.

Cultivating Student led Tutorials in STEM

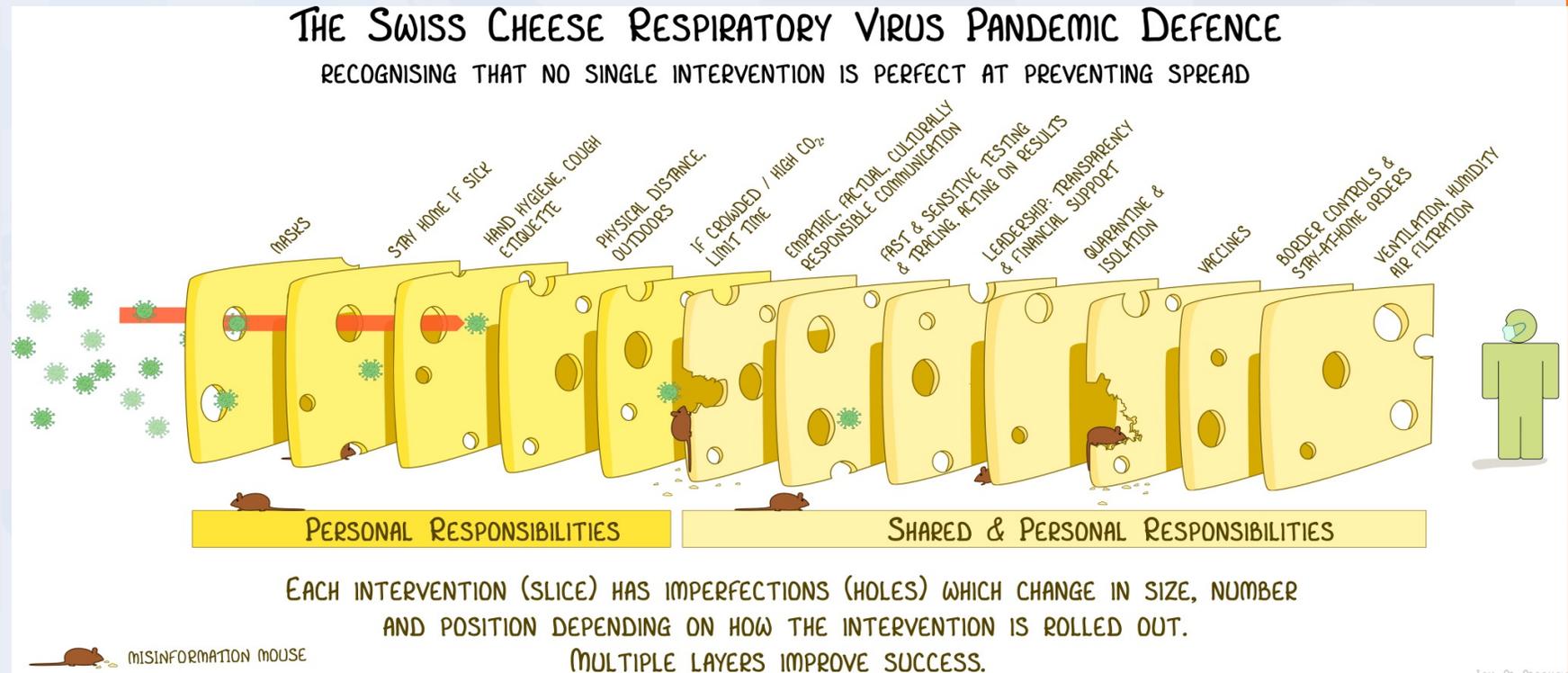
Melanie Gregg, Vivien Cleary

The Breakout room activity: example 2 – essay writing

Question:

Plan an essay with an introduction, 3 paragraphs and conclusion for:

Discuss the top 3 mitigations in preventing corona virus transmission



Mackay, Ian M. (2020): The Swiss Cheese Respiratory Virus Defence. [figshare Figure.](https://doi.org/10.6084/m9.figshare.13082618.v26)
<https://doi.org/10.6084/m9.figshare.13082618.v26>

IAN M MACKAY
VIOLOGYDOWNUNDER.COM
LANARD, KATHERINE ARDEN & THE UNI OF QLD
BASED ON THE SWISS CHEESE MODEL OF ACCIDENT CAUSATION, BY JAMES T REASON, 1990
VERSION 4.3
UPDATE: 04SEPT2021



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Now it's your turn to try skills based tasks...

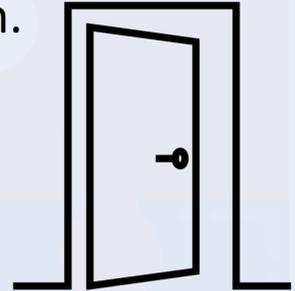
You will be assigned a break out room where you can access 3 interactive activities.

Background information, Interactive tasks and solutions await you in your break out room.

Once in your room please **select one person** as spokes person for the plenary.

You will be provided with a link to a padlet board for comments.

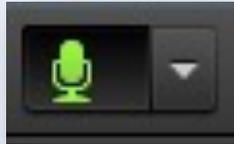
This activity is a breakout room activity taster for you and will be approximately 10 minutes.



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Reminders



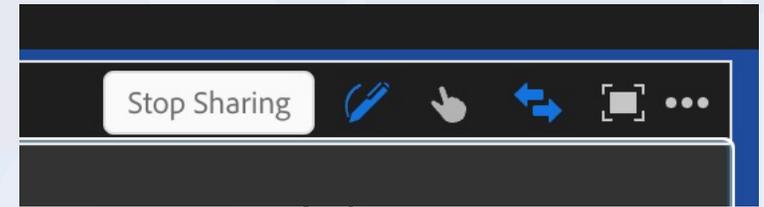
Microphone use

Click to make mic green and active
You can now talk 😊



Click again to turn it off

Draw tools



Click on the draw tool icon to disable it.
Then you can use the link to padlet.



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Please avoid clicking on the 'Stop Sharing' button 😊

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



The screenshot shows a Zoom meeting interface. The main slide content is as follows:

Task 1: Background information on table design

Scientific tables need to be clear, accurate and uncluttered. They must:

- Contain only relevant information
- Have correct units in column headings rather than main body
- Ensure spelling & grammar is correct
- Include an explanatory title

Logos for ESTEEM THE OU CENTRE FOR STEM PEDAGOGY and The Open University are visible. The footer text reads: "Cultivating Student led Tutorials in STEM Melanie Gregg, Vivien Cleary".

An orange circle highlights the "INSTRUCTIONS" panel on the right, which contains the following text:

Interactive tasks
There are 3 questions (table design, hypothesis and calculations), please attempt at least one, you may attempt any of the three.
Each question has a background information slide, a main question slide and a solution slide. Use the arrow keys at the base of the slide to progress.

1. Comment on how your group coped with each task
2. How did the group ensure everyone participated?
3. Did this activity achieve its objective (to allow peer to peer interaction and encourage more confident learners)?

Remember to nominate a spokesperson for the padlet review using the following link
<https://padlet.com/melaniegregg/interactive-tasks-ul32goqazyjggi>
Or click on the link on screen after disabling the draw tools.

Below the instructions panel, the "CHAT M & V" and "ATTENDEES (1)" panels are visible. The chat panel shows a message: "Start a conversation with everyone or chat privately with the Hosts, Presenters or any Attendee". The attendees panel lists "Hosts (1)" with "Melanie Gregg | You".

At the bottom right, there is a "CLOCK_V3.ZIP" panel showing a clock face.

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

:Padlet

melaniegregg • 16d

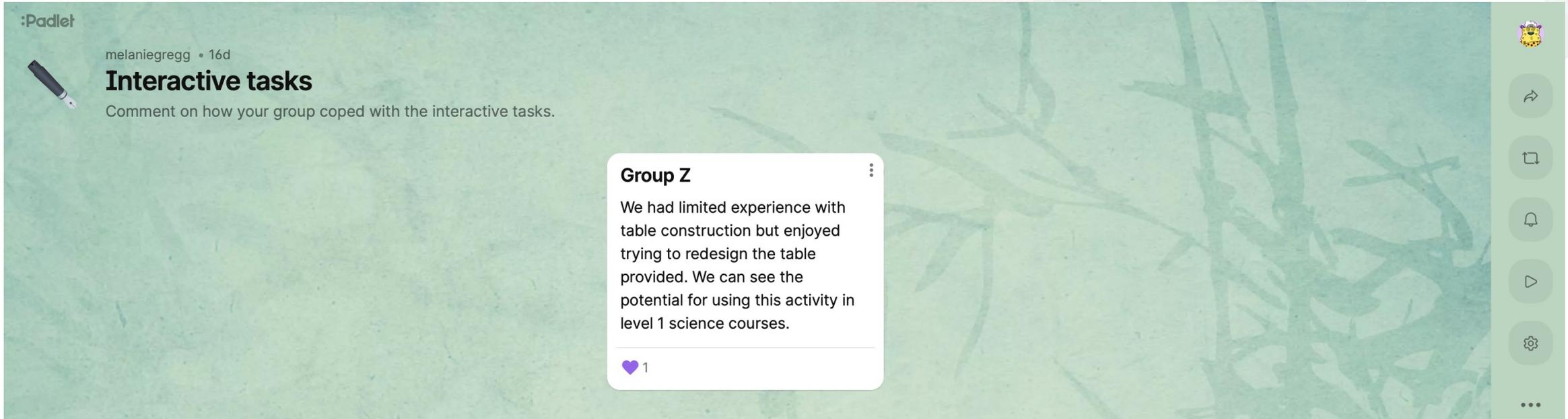
Interactive tasks

Comment on how your group coped with the interactive tasks.

Group Z

We had limited experience with table construction but enjoyed trying to redesign the table provided. We can see the potential for using this activity in level 1 science courses.

♥ 1



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



Each breakout room has 3 tasks and you have 10 minutes to complete at least one.

Each task has 3 slides

- 1. Background information (if required)**
- 2. The main question**
- 3. A solution**

Then you will get a reminder for the spokes person to complete the padlet board.

The remaining attendees can click on the padlet board hearts to agree.



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

ESTEEM-CO eSTeEM and Co. On... ▾



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



Findings

1. After initial awkwardness most students enjoyed the challenge of completing a task in a tutor free space.
2. They preferred a mix of tutor led and interactive sections with ONE tutor free breakout room task.
3. The task design needed to be relevant to the upcoming TMAs.
4. A good tutor/student relationship is key to students' interaction and perception of course.
5. Fun and enjoyment was highly rated.

86% of those surveyed with JISC rated breakout rooms as beneficial in skills development.



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

After tutorial 3

7 Have the break out room activities increased your skills?



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Survey Question:
How successful or unsuccessful
were the student led breakout
rooms?

'I think what really surprises me is how quickly completely strangers can actually work together constructively to arrive at answers.'

'Oh, I think very successful... That's been a real surprise. These breakout sessions are very well designed.'

'I never came away from those breakout rooms thinking, well, what was the point of that? I always learned something.'



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Give a green thumbs up when you have finished reading the slide 😊

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Survey Question:
Did you enjoy working without the tutor?

'The breakout rooms helped by practising the technique and then comparing with the rest.'

'When another student explains it offers new insight.'

'I actually just really enjoyed the interaction.'

'I think that gave us more space to say something that might be wrong or worrying about looking foolish, because you are with other students.'

'It was good to bounce off other people.'

'If we got it wrong, you know we would help each other out.'

'It was okay to be without the tutor for a short time.'

'Just talking to one other student was good.'

'An opportunity to drill down aspects of the reading I didn't fully understand.'



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Give a green thumbs up when you have finished reading the slide 😊

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Conclusions

1. Invest time in building a good tutor group community.
2. Provide some tutor free space (breakout rooms) with relevant activities in your tutorials.
3. Integrate fun into the tutorial, so learning is perceived as enjoyable.
4. Avoid packing everything into a tutorial and allow wriggle room for questions, learning from mistakes etc.
5. How students perceive their tutor is important to their progress – be supportive and encouraging.
6. These tutor free spaces have potential across all disciplines.

Be less of a sage on the stage and more of a guide by their side 😊



Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary

Further research.

Where do we go from here...

- A large scale study.
- Matching digital footprint and academic performance with participation in active peer learning.
- Encouraging confident and widespread participation in student led breakout room activities.



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

'Tell me and I forget. Teach me and I remember. Involve me and I learn.'

Cultivating Student led Tutorials in STEM

Melanie Gregg, Vivien Cleary



The final report is available on the ESTEEM website:

<https://www.open.ac.uk/scholarship-and-innovation/esteem/projects/themes/supporting-students/cultivating-student-led-tutorials-stem>



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

Any questions



Your feedback



Do please give us feedback on the whole workshop experience via a padlet board:

<https://padlet.com/melaniegregg/workshop-review-nsodcoqfdno2uds>



ESTEEM
THE OU CENTRE FOR
STEM PEDAGOGY

You can agree with a comment by clicking on the corresponding heart 😊