

# Use of student-created video resources to enhance science practical skills training

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## Background

- We have introduced the use of Objective Structured Practical Examinations (OSPE's) in science teaching and previously piloted successful delivery of theoretical, practical and problem-solving skills at multiple stations to formally examine a wide range of communication and science laboratory practical skills.
- As the range of disciplines being examined has expanded, the number of students participating have also increased, leading to challenges delivering the required practical skills to all students within the time and space available.
- Previously, students learned and practiced in advance of the examination in a large, busy all-day practical class. However, teaching delivery had the potential to be variable and some students required more time to practice.
- To address this, two students created a series of video teaching resources in collaboration with academic and technical staff. It was hoped that students could use these to prepare more effectively, and cater for a wider range of learning styles within the learner population.

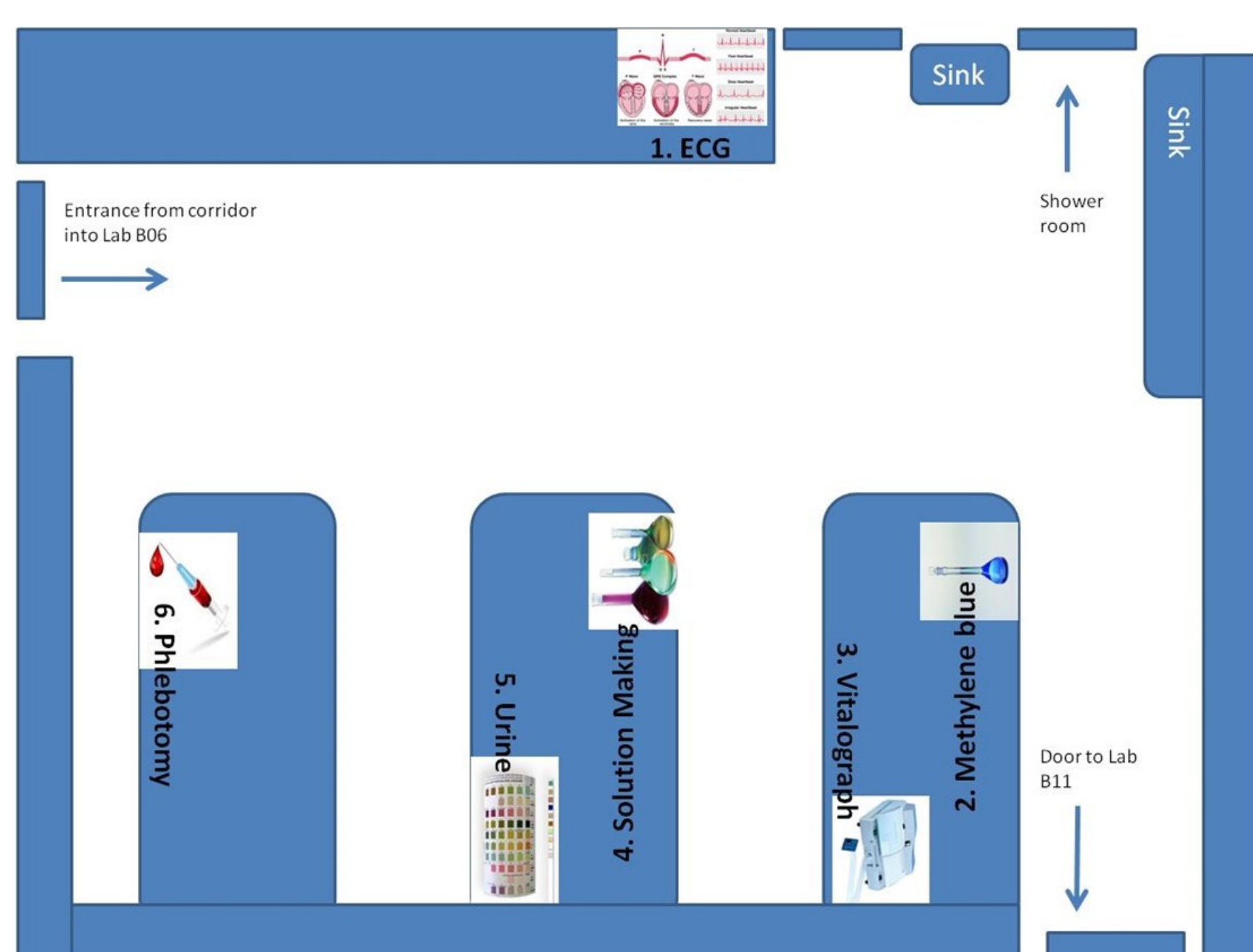


Figure 1. Example of the stations/ lab layout used in OSPE's for physiology students.

Students rotate round six stations in one hour and undertake a variety of tasks demonstrating different skills/attributes.

Students report they think about employability skills during this exercise such as time management, planning and coping under pressure—things they often are asked when applying for jobs.

This style of assessment caters for those learners who prefer visual or kinaesthetic learning, rather than traditional read/write modes of assessment (e.g. lab reports).

## Aim

To develop a series of video resources that would provide useful training for the variety of scientific concepts, transferable skills and graduate attributes that students would be assessed on during their discipline-specific OSPE.

## Methods

- These training videos were created using free recording/editing software and recorded using free software on mobile phones.
- Videos were edited using free software on Apple Macbook computers.
- Videos were no longer in duration than 5 minutes and were designed to help students understand how best to complete the tasks at each assessment station.
- Videos were released to students through the VLE (along with written materials) and they were instructed to prepare prior to the practical class.
- Previous project students had developed science skills videos on a central university resource known as Toolkit. Links to these resources were also provided for students <https://www.abdn.ac.uk/toolkit/services/physiology-pharmacology/>
- Smaller groups of students were allocated to 2 hour long practical classes where focussed practice time and further instruction was available with technical and academic staff.

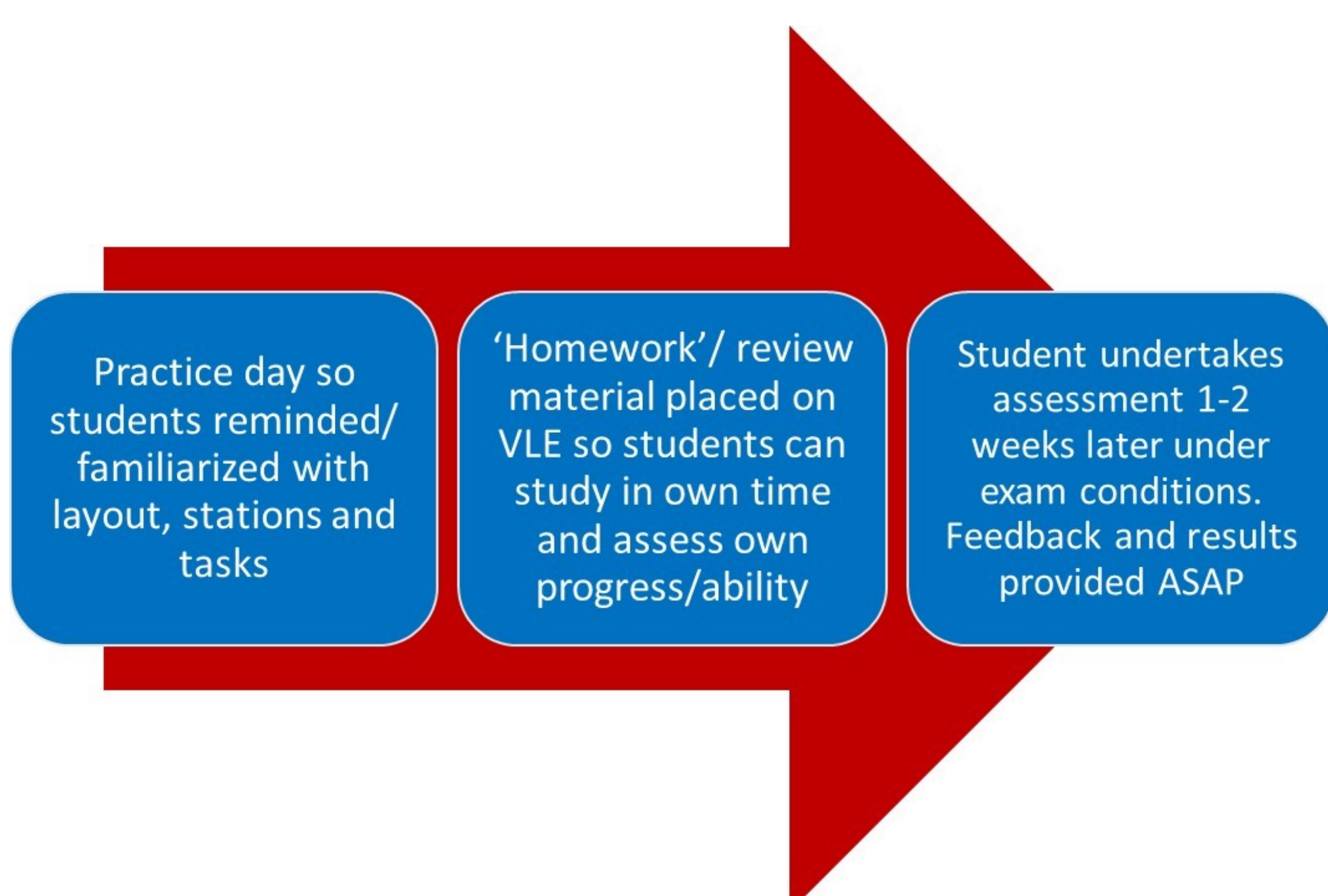


Figure 2. Process/events that students experienced when undertaking OSPE

Students could rehearse for OSPE during practice week when staff were present to provide guidance and help. Videos, written study materials and full assessment criteria were provided online to help them gain in confidence. Students attended during one hour assessment sessions and wrote answers to stations in simple answer booklet.

## Examples of student-created video resources for OSPE's

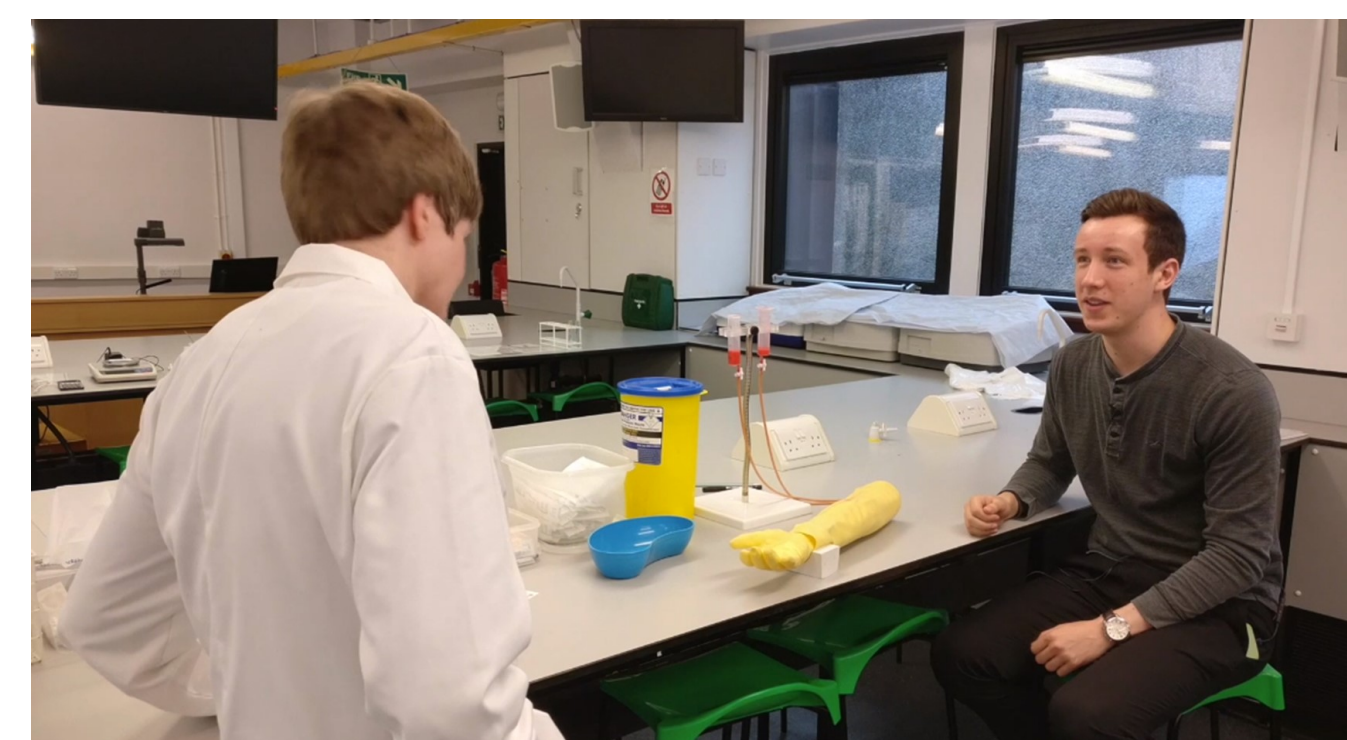
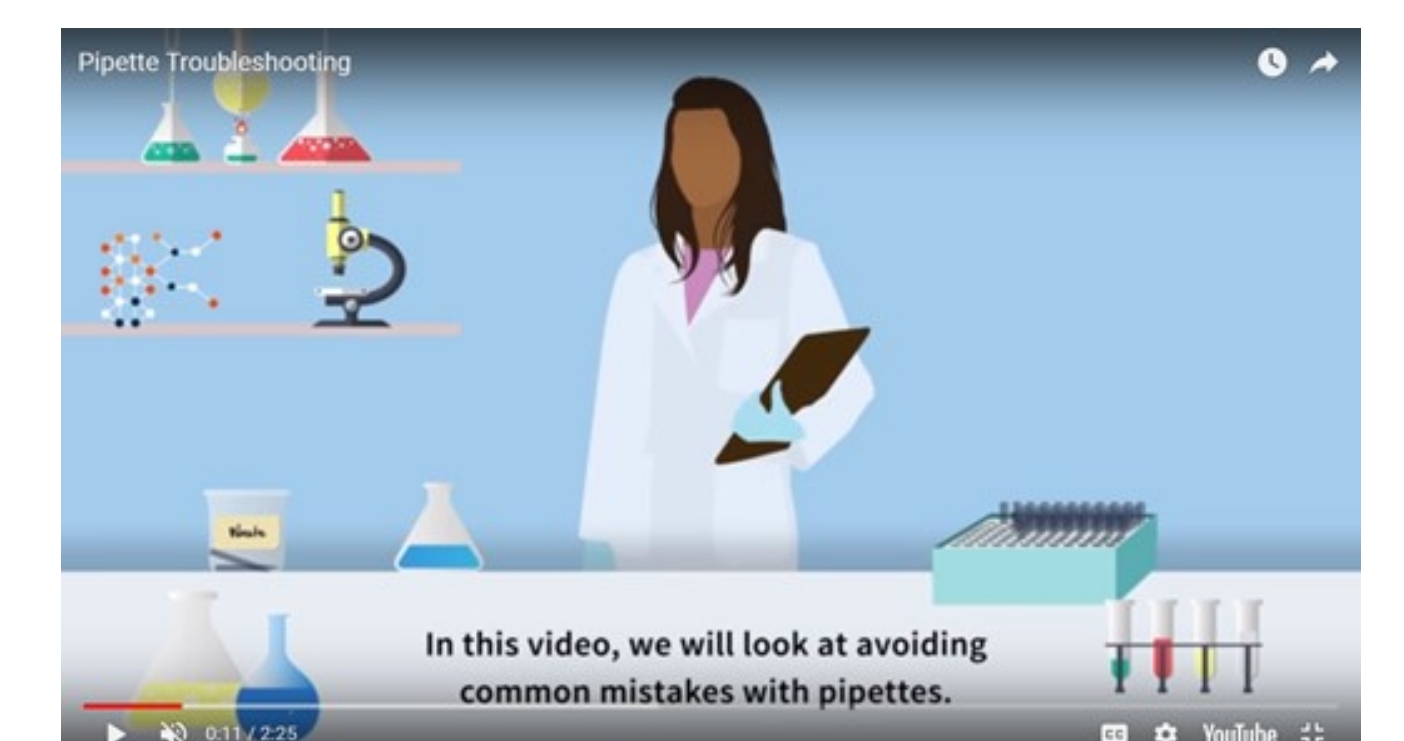


Figure 3. Screenshots from videos developed by students.

Some of the stations focused on communications skills and other 'softer' skills/graduate attributes, as well as more technical scientific skills

Videos were designed to provide detail about what was required, but also focused on how students could manage their time effectively, cope with problems.

Variants of the videos were developed for different subject disciplines.



## Results

- No significant difference in mean score achieved by physiology students (2017-18 cohort,  $20.11 \pm 2.00$ ,  $n = 43$ ) was identified when comparing with data recorded last year from students who did not have access to the video resources (2016-17 cohort,  $19.54 \pm 1.26$ ,  $n = 52$ ) ( Data represents mean score  $\pm$  stdev).
- This suggests that student performance did not suffer by reducing the practice time before the assessment. The same result was observed in a separate anatomy cohort of students when comparing performance between this and last year.
- Feedback recorded in the university central course evaluation forms from both physiology and anatomy students cited the OSPE assessment and the new videos as being one of the best things about their respective courses.
- Staff reported that use of the video resources meant that students appeared to be better prepared and less nervous, and were more focused when attending their practice sessions.
- Data from the VLE showed a surge in video watch time for the majority of students in the day before their assessment.

### The OSPE practical exams

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Figure 4—Feedback from anonymised central university survey 2016-17

How effectively did the OSPE exercise address your learning needs? (n = 52)

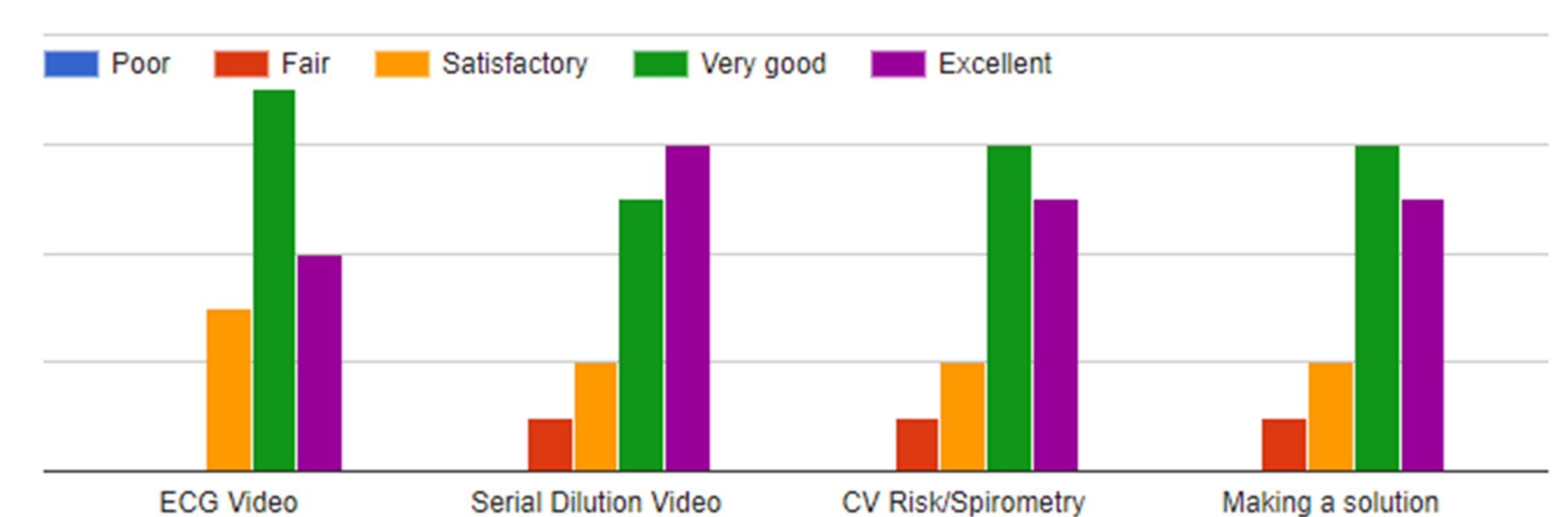


Figure 5. Feedback regarding some of the video resources.

- Large file size, takes time to buffer – maybe use YouTube so we can access via phones?
- Liked that none of them long – usually 3-5 minutes.
- Liked that it was students designing and presenting them – at correct level.
- Should make more for all sorts of skills types during our curricula.
- Staff felt they spent less time explaining how to do things but more time discussing why things mattered and reflecting with students about their approaches.

## Discussion & Conclusions

- These results suggest that larger, diverse practical classes can be trained in a consistent and effective manner by using student-created video resources.
- These videos have allowed us to operate practical training classes more efficiently and work with smaller groups of students, without detrimental effect on student assessment outcomes.
- Video resources will be reviewed to integrate suggested improvements and we will explore introducing subtitles to cater for students who have difficulty following the audio content.
- Future work will involve the development of further videos for a wider range of practical skills, as well as analysing whether any correlation exists between video watch time and score achieved in the OSPE assessment.