

# Developing physiology graduate skills and attributes with Objective Structured Practical Examinations (OSPE's)

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## Background

- Objective Structured Practical Examination (OSPE) assessments of theoretical, practical and problem-solving skills at multiple stations are commonly used to evaluate clinical practical skills in student populations.
- However, other disciplines outwith clinical professions (e.g. science subjects) rarely use this successful assessment style.
- We have adapted this format to formally examine a wide range of communication, ethics, numeracy, graphic interpretation and science laboratory practical skills to prepare physiology students for their honours research projects and to enhance their employability. We have recently expanded the range of students formally examined by creating new assessment stations and adapting others to examine pharmacology practical skills.
- Using benchmark statements, student, staff and examiner feedback, stations assessing contextualised skills such as numeracy, graphic interpretation, ethics, health and safety, communication skills, and human physiological data capture were developed.

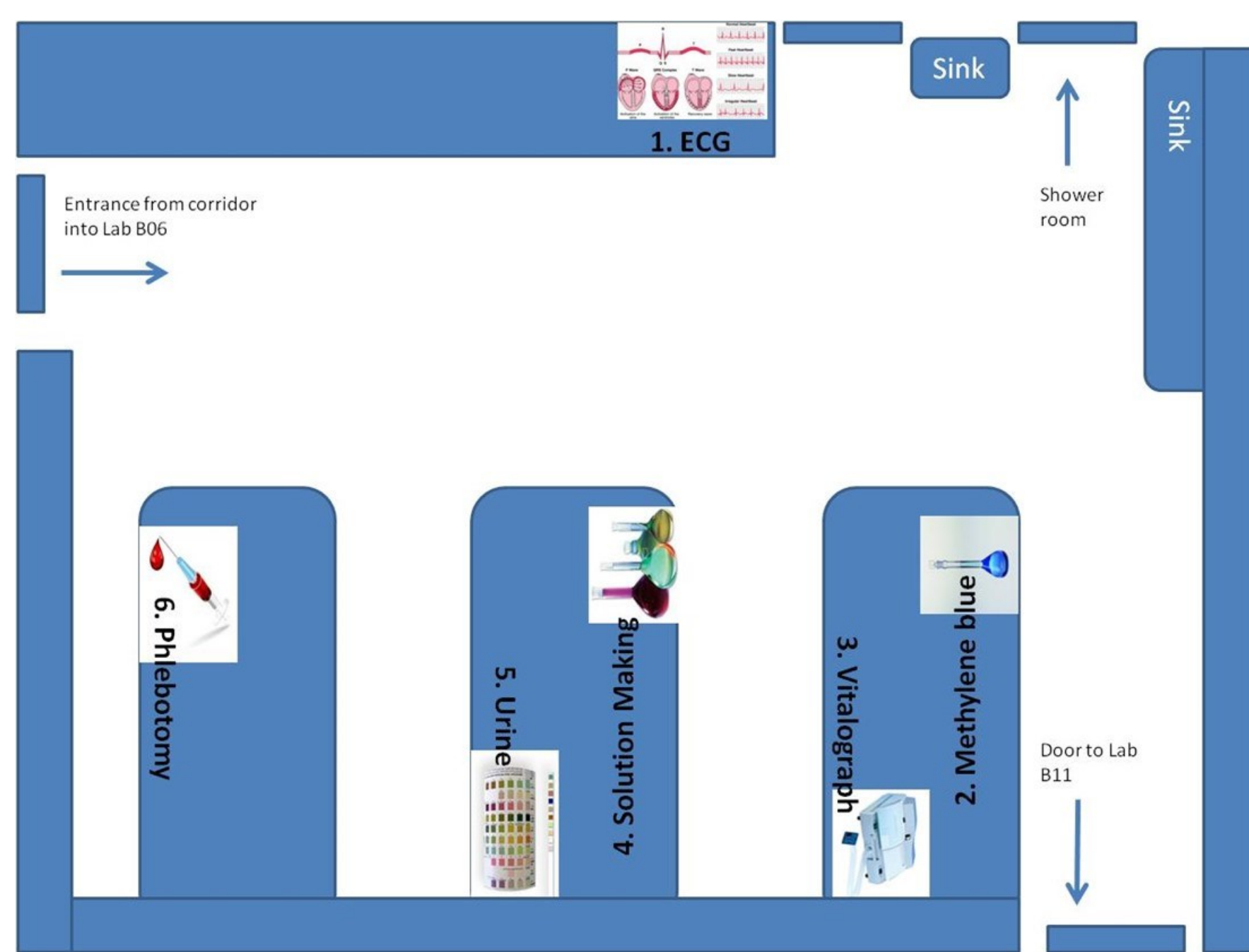


Figure 1. Example of the stations/ lab layout used in OSPE's for physiology students.

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).

## Aims

To design a 6 station OSPE assessment for Honours physiology students that would provide useful training and feedback regarding a variety of scientific concepts, transferable skills and graduate attributes.

## Methods

- Piloted with 2012-13 Honours physiology class (n = 51 students), but now running for 5 years.
- Team of academic and technical staff involved to design, review and assess material.
- Materials and logistics to make it successful for both staff and students had to be considered and designed carefully (see Figs. 2 & 3).

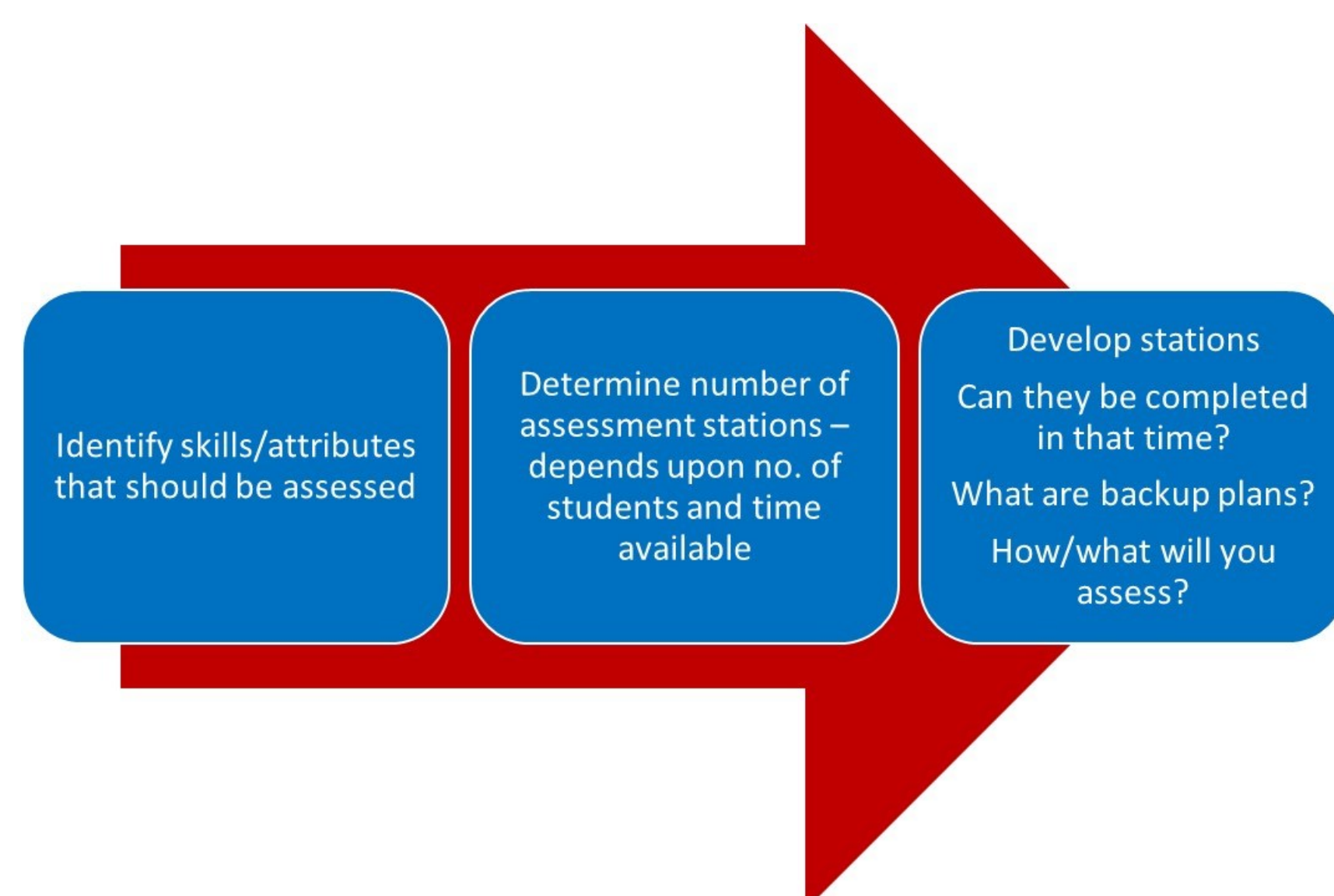


Figure 2. Key issues that staff team considered when developing new OSPE

Staff team used a variety of resources, as well as student/staff feedback to identify what should be assessed and how. They also took part in various practice sessions to make sure stations were fair and easy to understand.

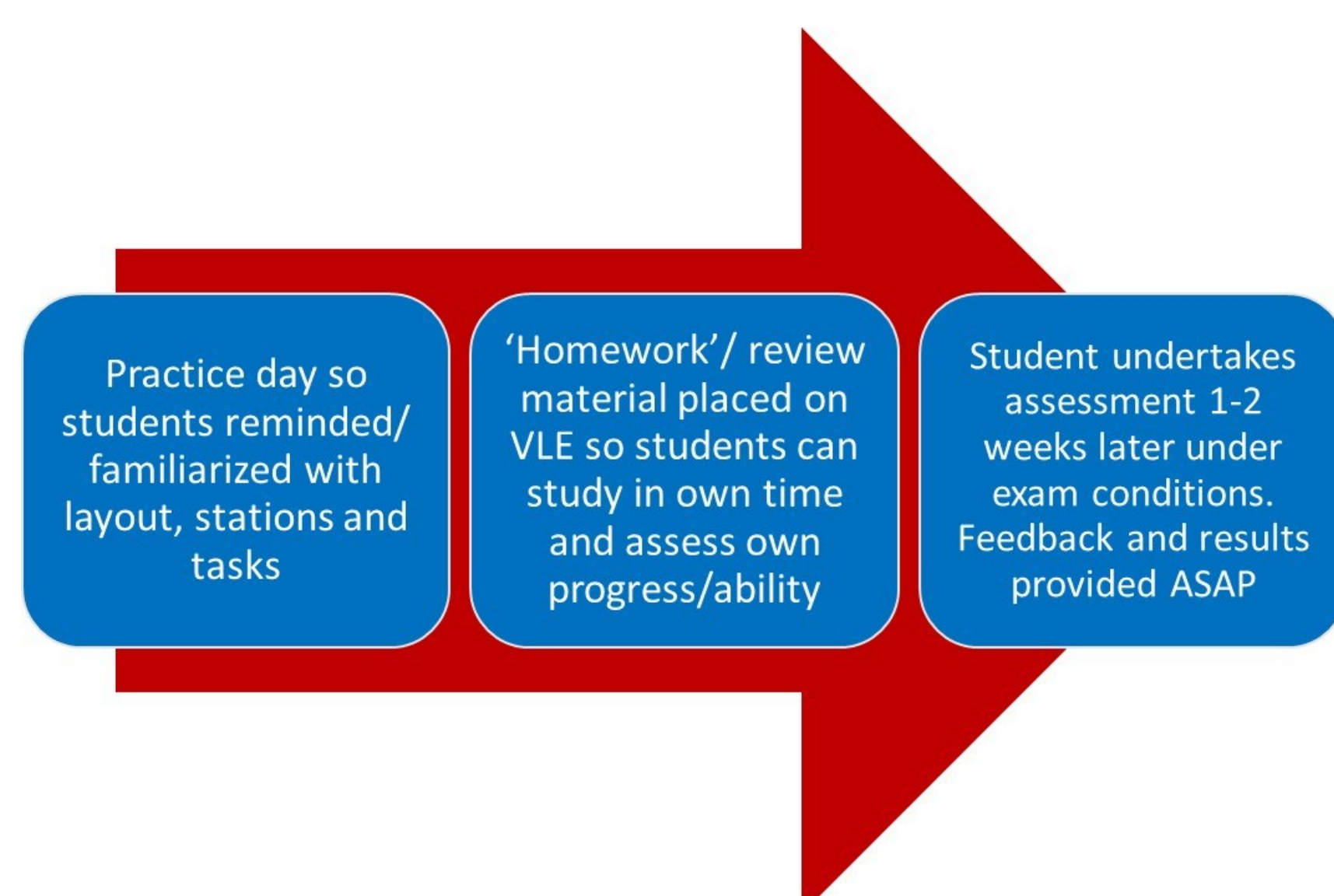


Figure 3. Process/events that students experienced when undertaking OSPE

Students could rehearse for OSPE during practice week when staff were present to provide guidance and help. Study materials/ 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.

## Finalised Choice of Stations/Tasks for Physiology Students

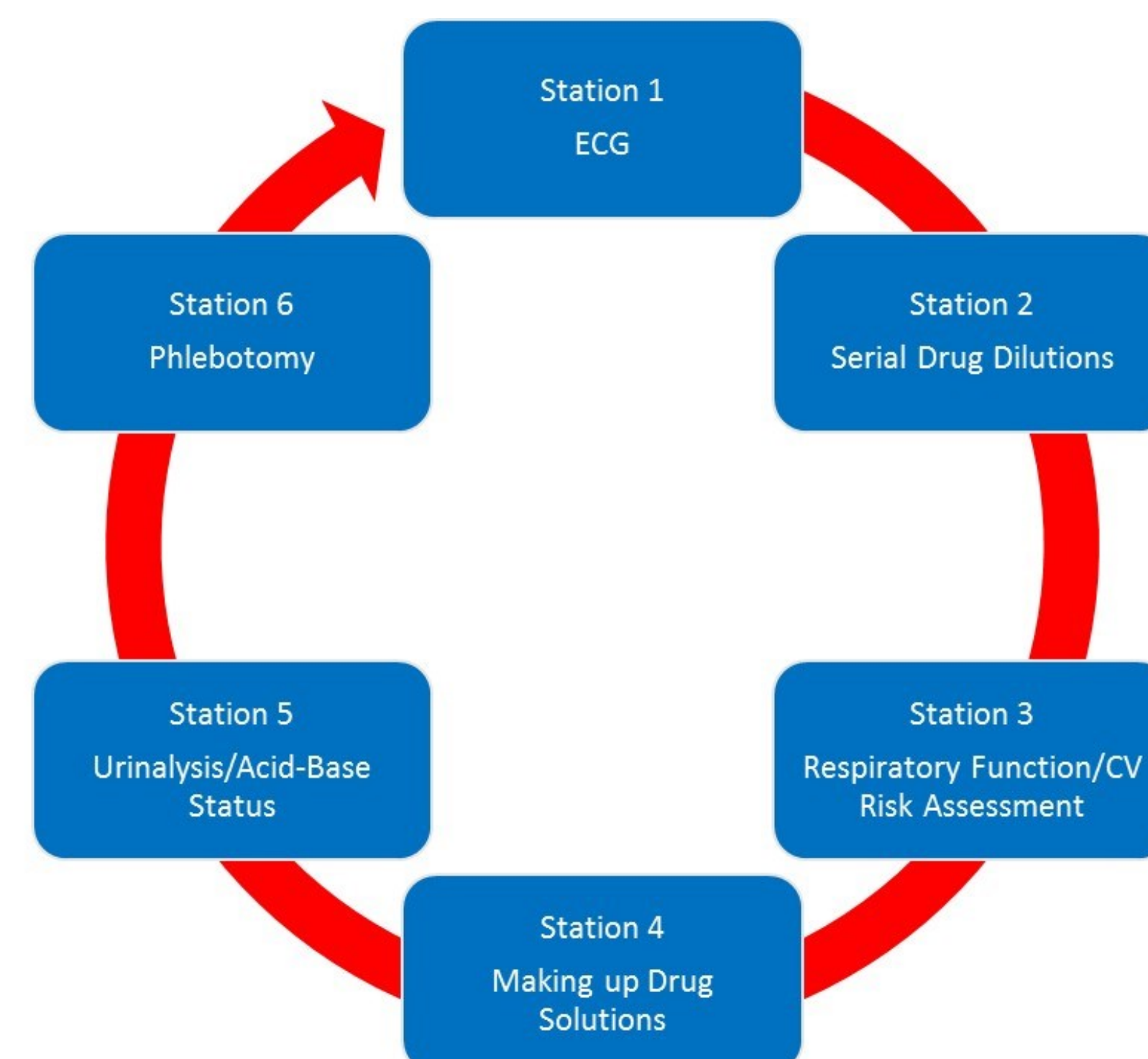


Figure 3. Final choice of OSPE stations for physiology students.

Some of these stations involved generic skills that had already been trialled with previous years' of Honours students. Others were developed specifically for this exercise. Stations were designed to be accomplished within time allowed, graded transparently, thus enabling rapid provision of useful feedback.

## Results

- As well as reviewing their grades and feedback, students were encouraged to reflect upon their own approach to the exercise and how these skills attributes might be useful for things like CV's, job applications, setting goals etc. time management.
- Many students told us that it was 'scary but really useful', and that it made them think about 'how work was undertaken and the broader range of skills employers might want, rather than just scientific knowledge or being good at specific techniques'.
- Students also identified their own strengths, as well as gaps in their abilities/knowledge during the practice session and set out to remedy these during the study period before the assessment.
- Comments from the anonymous student feedback survey/staff-student liaison committee showed that students were all extremely supportive of this type of exercise and demanding its expansion into other degree disciplines e.g. anatomy, pharmacology, sports science etc..
- Despite some stations being stereotypically perceived to be harder for the students (e.g. phlebotomy), it turned out that they did very well at those, and it was the more fundamental practical lab skills (e.g. serial dilution) that seemed to stress students more.
- Average grade over last 5 cohorts (n = 253 students) = 76.2 ± 0.7 %.

Feedback from anonymised central university survey 2016-17

How effectively did the OSPE exercise address your learning needs? (n = 53)

### The OSPE practical sessions

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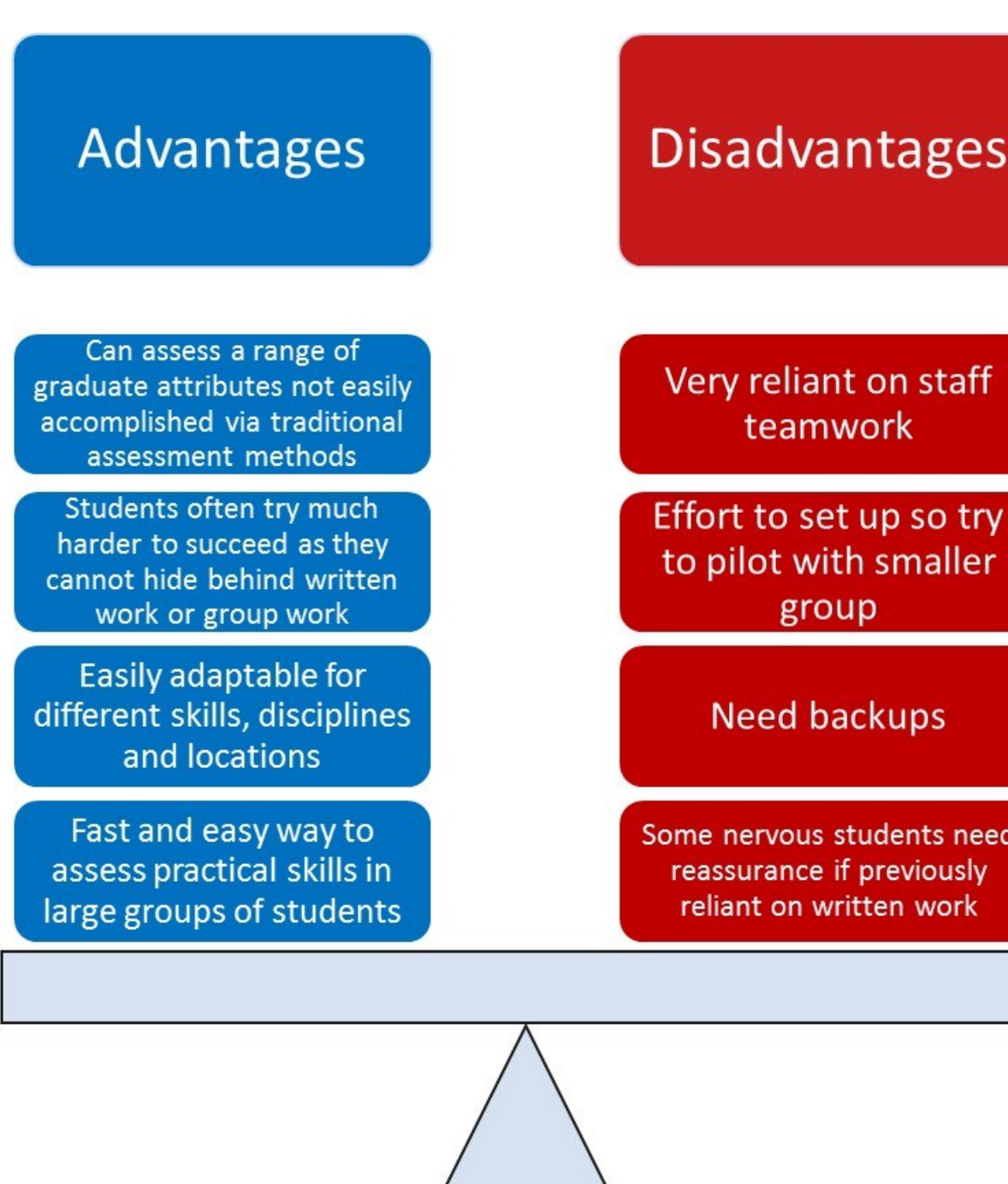


Figure 5. Identifying areas of strength and future development.

- Initial logistical issues are the main obstacle to overcome, but once the material has been generated, it can be re-used with minimal effort in future iterations.
- If stations rely too much on technology, backup plans must be in place.
- Stations do not have to focus upon traditional science skills to be challenging, informative and useful.
- Be willing to change stations if you feel they are not working well, or if you want to assess different skills/attributes.
- We have designed our stations/format to be run in any location, and to be scaled up in case a class is extremely large.
- Instructions/language in written materials must be clear.

## Discussion & Conclusions

- Positive feedback from both staff and students but we feel we can still improve (See Fig. 5).
- Electronic answer submission using tablets at some stations speeds up grading/delivery of feedback for larger classes—we are trialling their use for all stations.
- In conjunction with students, we are developing animated, mobile-friendly videos to help visual learners better review the tasks/material outside the lab environment. If these are perceived as useful then we will make them available to the whole student population via the VLE.
- Staff feel they have a more detailed understanding of their students' capabilities and graduate attributes, helping them better advise them on their targets, goals and strengths.
- This assessment style allows rapid assessment with large numbers, but we plan to review the scheduling of the OSPE so we match with other degrees. This could allow us to share resources and staff for the OSPE's to further improve our efficiency and the student learning experience.