

Adapting Objective Structured Practical Examinations (OSPE's) to assess laboratory science skills in pharmacology students.



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Background

- Objective Structured Practical Examination (OSPE) assessments of theoretical, practical and problem-solving skills at multiple stations have been adapted to examine practical skills in science disciplines to enhance employability and prepare students for research projects (example provided below in Fig. 1).
- We have recently expanded the range of students formally examined by creating new assessment stations and adapting others to examine pharmacology practical skills.
- This was primarily done in response to student feedback -they had heard positive comments about the OSPE experience from the year ahead's student body.
- Using benchmark statements, student, staff and examiner feedback, stations assessing contextualised skills such as numerical, graphic interpretation, drug mechanisms and targets, pharmacokinetics, and use of physiological data to identify appropriate drug treatments were developed.

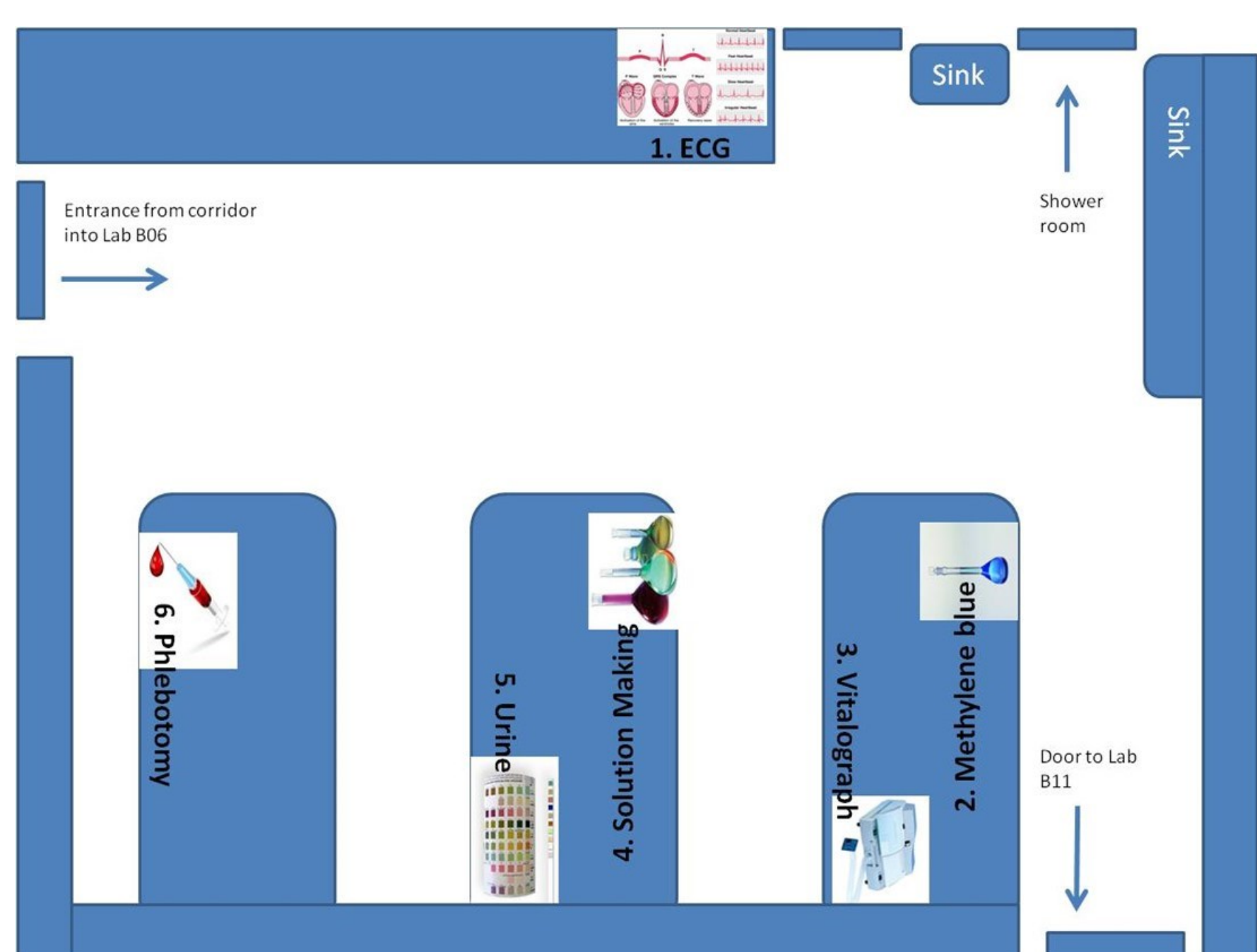


Figure 1. Example of the stations/ lab layout used in previous OSPE's for physiology and anatomy students. Students rotate round six stations in one hour and undertake a variety of tasks demonstrating different skills/attributes. Students report they think about employability skills during this exercise 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 pharmacology students that would provide useful training and feedback regarding a variety of scientific concepts, transferable skills and graduate attributes.

Methods

- Piloted with smaller class to make development easier (n = 22 students).
- 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).

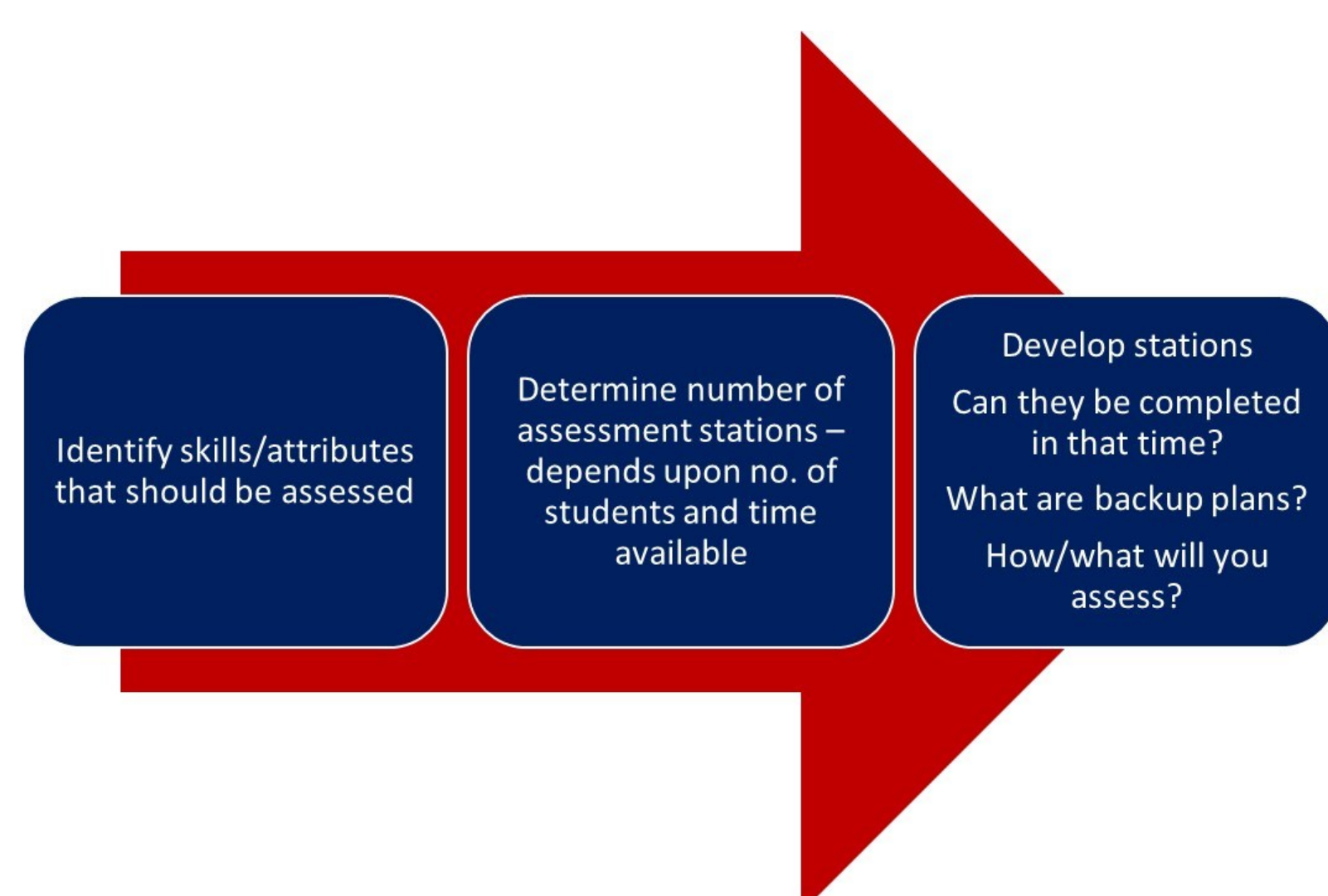


Figure 2. Key issues that staff team considered when developing new OSPE

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.

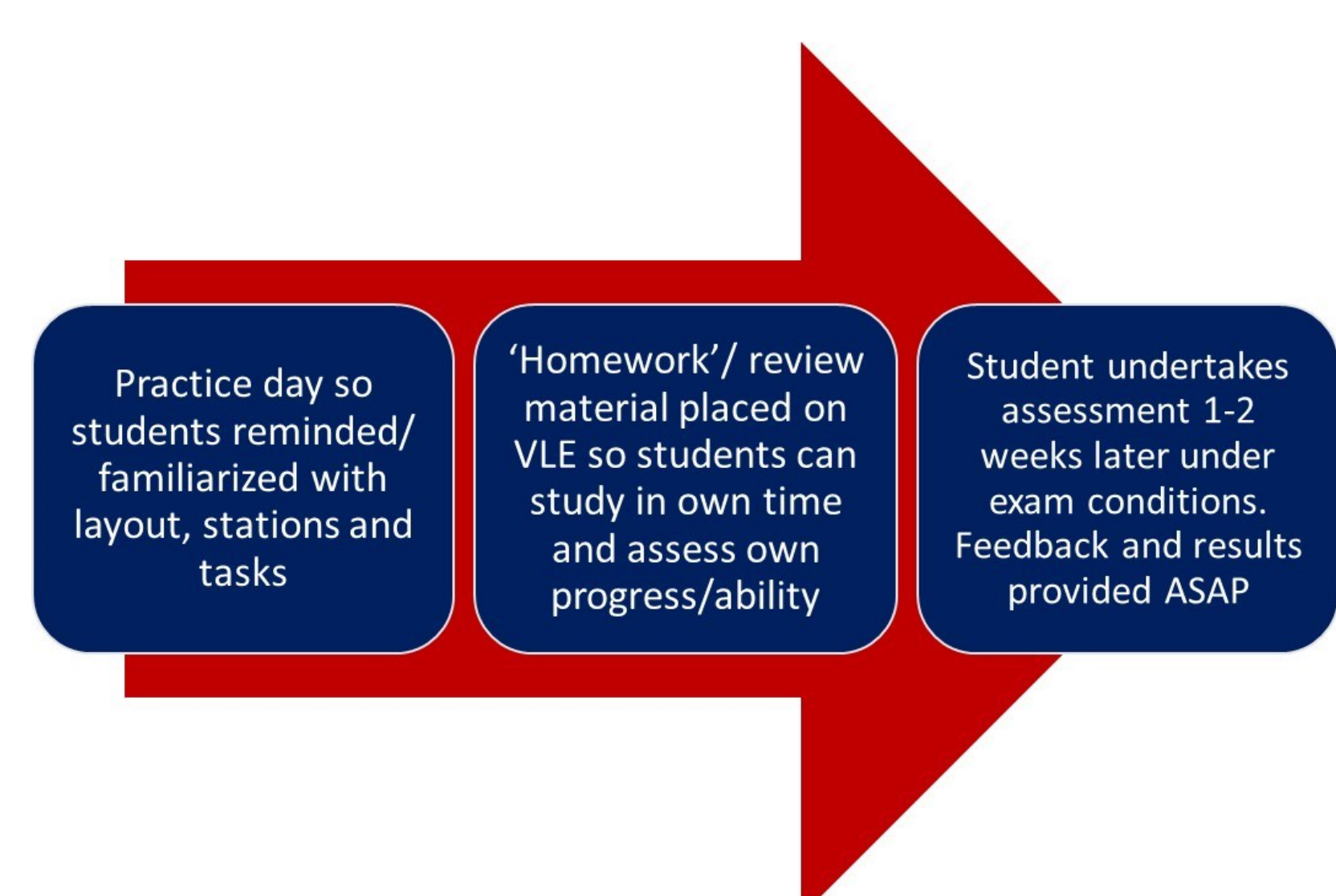


Figure 3. Process/events that students experienced when undertaking OSPE

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 Pharmacologists

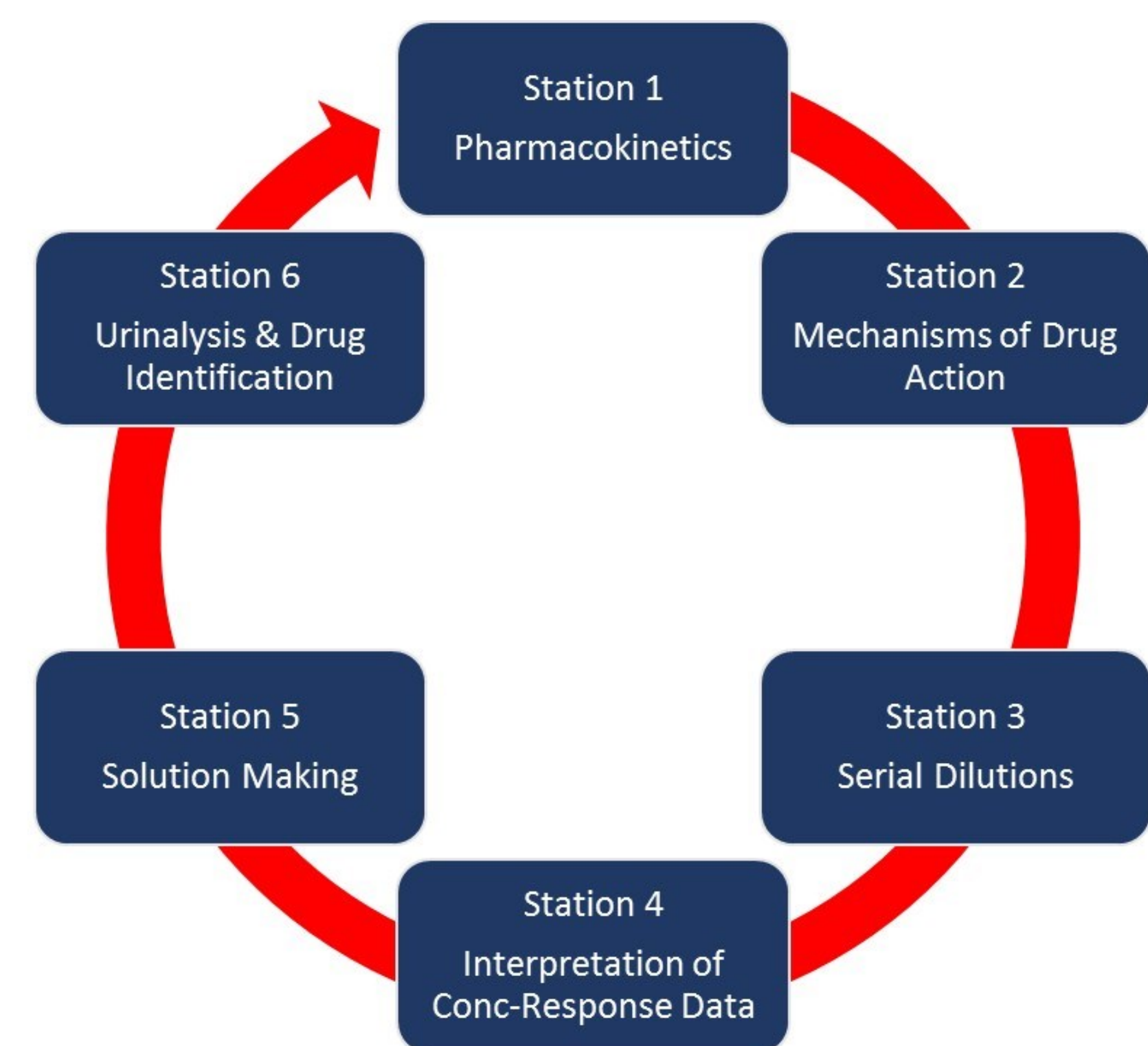
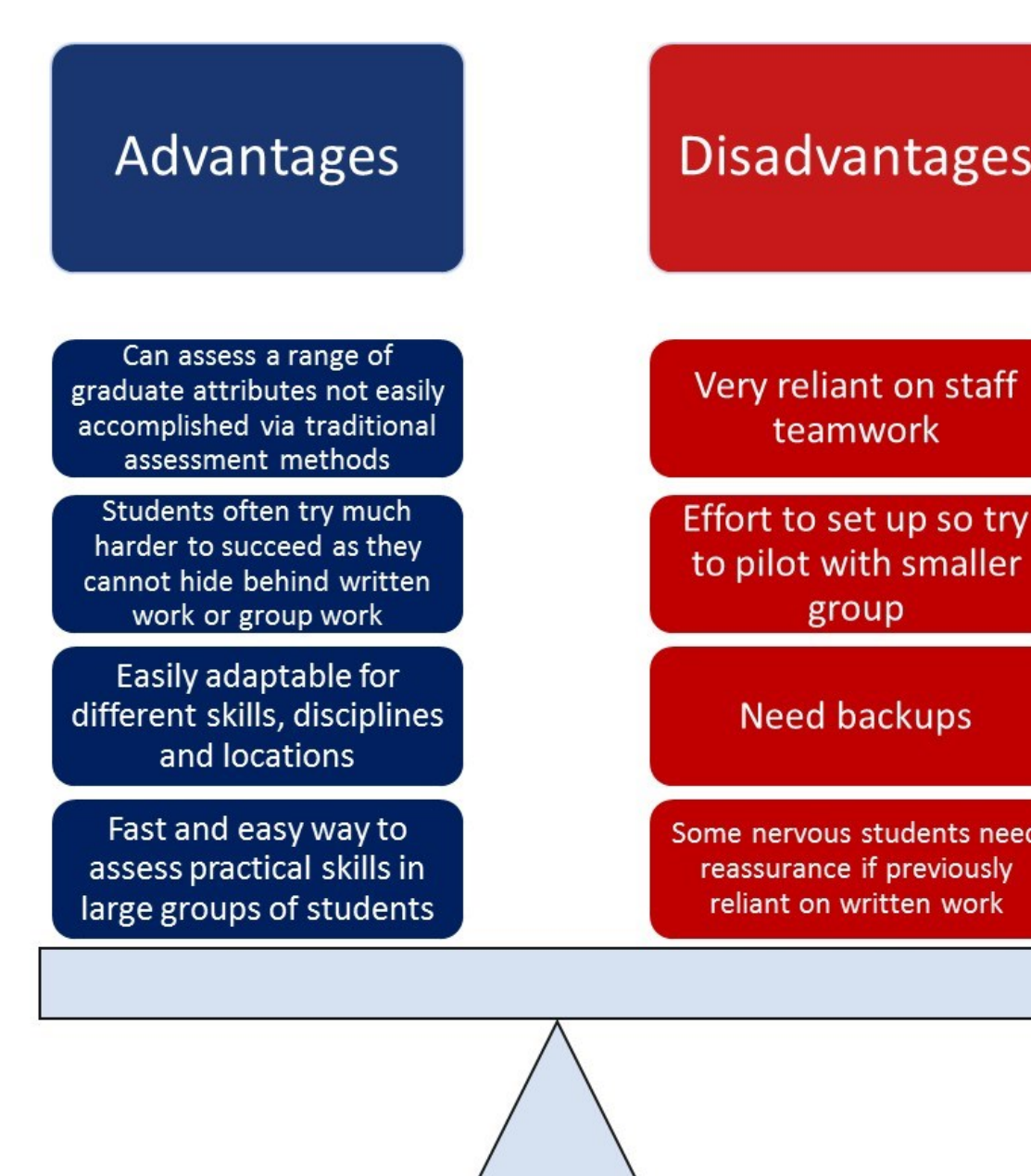


Figure 3. Final choice of OSPE stations for pharmacology students.

Some of these stations involved generic that had already been trialed 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'.
- 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.
- No student failed the assessment. Three academic staff were involved in grading the OSPE.
- Comments from the anonymous student feedback survey and the staff-student liaison committee showed that students were all extremely supportive of this type of exercise.
- Despite some stations being stereotypically perceived to be harder for the students (e.g. pharmacokinetics), 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. The greatest range of grades was achieved during the interpretation of concentration-response data station.



- 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 in 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 could speed up grading/delivery of feedback for larger classes—this is already partially used for the anatomy and physiology OSPE's.
- 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.
- We are developing a new station that will use IV infusion as a scenario for assessing students' communications skills, as well as their understanding of concepts such as health and safety, informed consent, ethics and 'normal' biomedical data.
- 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.