

Imperial's Approach to Case-Based Learning: CSI

A Digitally Supercharged Recipe for Successful Future Doctors

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BACKGROUND

CONTEXT:

- Imperial College School of Medicine is undergoing a major curriculum review, focused on digital innovation, patient-orientated integration of content, an interdisciplinary approach and active learning¹
- Launched in 2019 for Year 1 MBBS students, Clinical Science Integration (CSI) is an innovative, flagship module

LITERATURE:

- Case-based learning is a vessel for integration and bridging theory to practice, promoting deep learning²
- Team-based learning (TBL) involves working with colleagues and using active learning to solve authentic problems³
- Today's medical students favour the use of technology⁴ and need preparation for digitalised health care systems

SOLUTION:

- CSI uses a case-based, team-based approach to prepare students for clinical practice from day one.
- CSI draws on science, clinical reasoning and professional values and behaviours to expand and connect understanding
- A task-based format creates a problem-solving environment authentic to a junior doctors', requiring students to assimilate information and supplement existing knowledge with use of teamwork, discussion and digital resources
- Technology underpins CSI; it not only provides input for students, but is a means of extracting responses.

DESIGN PROCESS

IDENTIFY:

Eleven year 1 cases were developed collaboratively, to match learning outcomes related to identifying, describing and managing common presentations to a GP

RESEARCH:

A core team identified key clinical and scientific themes within each case. Proposed content was researched and discussed with subject matter and educational experts

CREATE:

The core team selected supplementary reading, developed active learning tasks for sessions, produced videos (with a filming crew) and finalised assessment processes

EMBED:

Assets, supplementary materials and tasks were embedded into a learning management system. Tutors are provided with detailed teaching instructions

MODULE STRUCTURE:

PRE-SESSION



FACE-TO-FACE



POST-SESSION



ASSESSMENT



1. Introductory video
Module leads introduce the case to stimulate interest and motivation.



2. Patient persona
Students interact with objects to holistically explore the presentation.



3. Case video
A bespoke video portrays a patient's interaction with a doctor. This makes subsequent learning relatable and introduces non-verbal clues.

4. Reading material
Students study relevant resources, which encourage them to prepare for their sessions.

1. Active learning tasks
Teams work on short tasks within audience response tools, using research and discussion and building communication / problem-solving skills.

2. Facilitated discussion
Tutors use responses to facilitate wider discussion. Students receive feedback on their answers and processes, and learn from other teams.

3. Summary
Tutors summarise key learning points, reinforcing the integrative nature of the learning and strengthening the creation of relevant schemata.

1. Recap video
Module leads summarise the case, enhancing retention and encouraging further self-directed consolidation.

2. Task recap
Students get a list of the face-to-face tasks (without answers), providing spaced repetition and encouraging revision through explorative processes.

3. Reading material
Additional case-relevant material helps with consolidation and expansion of understanding, and guides self-directed preparation for assessment.

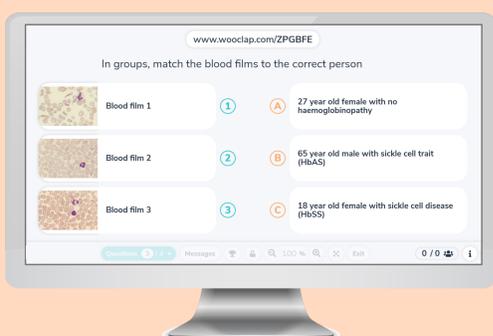
1. Individual Readiness Assurance Test (iRAT): 15 mins, weight 60%
Individuals complete 10 Single Best Answer (SBA) questions based on the case - a large incentive to engage and learn.

2. Team Readiness Assurance Test (tRAT): 30 mins, weight 20%
Teams then complete the same questions together, encouraging peer-to-peer teaching, improving understanding and building communication skills.

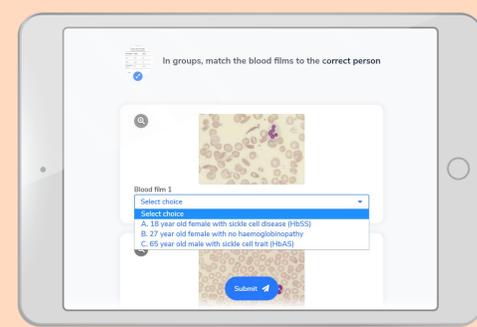
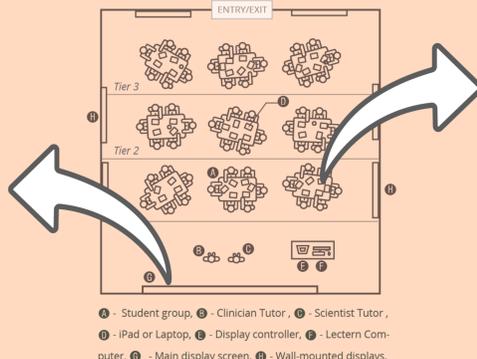
3. Team Application Exercise (tAPP): 75 mins, weight 20%
These challenging tasks require effective teamwork application and consolidation of knowledge.

ROOM SETUP

Projector Display



One example of a 'task': Tutors contextualise the task before introducing it to the class using an audience response tool



Students work in groups to respond to the task within the time allocated (usually <5 mins). A group leader submits the response

Student's iPad

FINDINGS AND CONCLUSIONS

Online student feedback is collected after each case, to evaluate case-specifics and monitor attitudes / skills. One term in, data is yet to show trends however the module is very well-received. Verbal feedback describes CSI as a 'favourite module'. Engagement with the sessions is supported by attendance rates that remain >90%.

The graph opposite shows survey responses following case 1, with resoundingly positive feedback on content, process and knowledge acquisition.

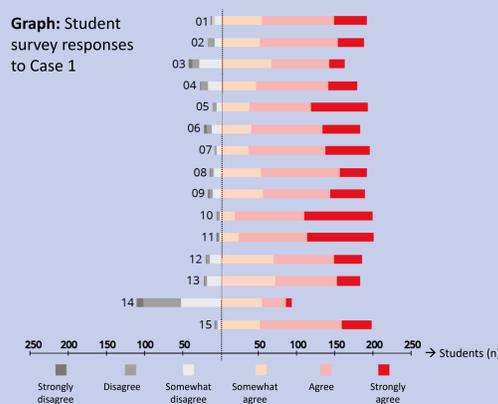
"CSI is immersive and stimulating. Tasks and discussions make me think and engage with the content and allow us to learn by experiencing instead of studying." - Year one student

"This is so different to how I was taught. It's dynamic, it's interactive. It gets students to challenge and reinforce their understanding. The case-based focus and technological platforms keep them engaged and get them thinking like doctors." - Clinical tutor

Challenges related to technology have included:

- Some tutors struggle to effectively operate digital platforms, which could impact learning experiences.
- Students have expressed frustration at the lack of availability of audience response tool slides after their session (digital tasks are wiped to refresh them for the next group and to limit supply of answers to subsequent students).
- Problems during summative assessments; e.g. log-in issues, wifi bandwidth issues, and logistical issues (such as the requirement for working devices).

Graph: Student survey responses to Case 1



- The pre-session reading provided enough background to prepare me for the session
- The content and tasks for the face-to-face session were pitched at the right level of difficulty
- This case was beneficial for integrating old and new knowledge from different sources
- The face-to-face session allowed enough time to cover the key material in the defined tasks
- The post-session reading was relevant and built on material covered in the session
- The iRAT/tRAT questions for the team-based learning assessment were pitched at the right level of difficulty
- The iRAT/tRAT questions checked understanding of the key themes introduced in the session and reading material
- The tAPP for the team-based learning assessment was pitched at the right level of difficulty
- The tAPP exercise was stimulating and interesting
- I was able to participate and make my voice heard in the group activities
- The process of discussing an answer in a team had a positive impact on my learning
- This case motivated me to explore and learn more about this topic
- At this point in time, I feel confident that I can produce an answer, using the CSI process of combining existing knowledge with other tools
- I feel stressed if faced with a question or task to which I don't immediately know the solution
- At the completion of this case, I feel confident in the knowledge I have gained

NEXT STEPS

DELIVERY

- Improved tutor notes incorporating screen shots of audience response tools and tutor aid slides
- Tutor training with use of digital tools
- Distribute screen shots to students after sessions

EVALUATION

- Interrogate learning management system for data on student engagement
- End of year survey analysis including evaluation of self-efficacy themes and perceived benefits of methodology
- Focus group studies

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