Student-authored computer-assisted learning (CAL) on the Edinburgh MBChB – lessons learned

Christopher J Graham[1] (christophergraham@doctors.org.uk), Rhianna McIntyre-McClure[1], Sophie Vennard[1], Michael Buckton[1], Rebecca M Reynolds[1,2], Ruth Andrew[2], Steven D Morley[1,2]

1 = Edinburgh Medical School, UoE; 2 = Deanery of Clinical Sciences, UoE

THE UNIVERSITY of EDINBURGH

Background

Computer-assisted learning (CAL)

Pedagogical research suggests that CAL empowers students by giving control of learning and simplifying visually intensive subjects [1], whilst providing an additional route to achieving curriculum-defined learning outcomes (*LOs*) [2].

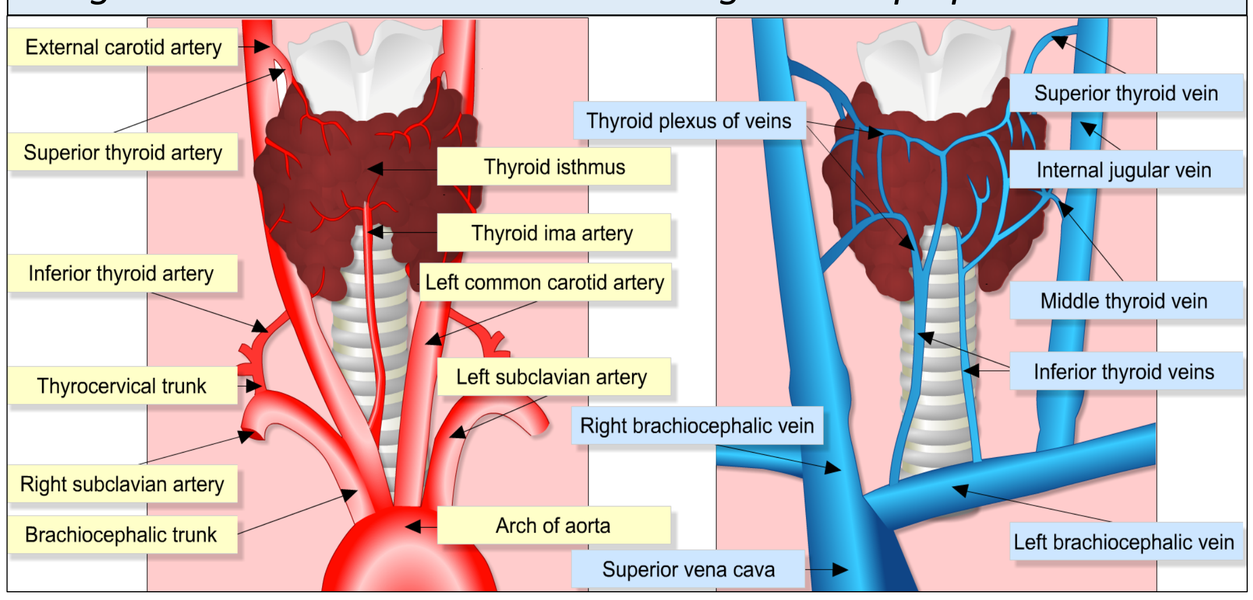
Endocrinology & Diabetes (E&D) CAL in Edinburgh's MBChB

A suite of staff-authored E&D CAL packages has been well received by University of Edinburgh (*UoE*) medical students. A new CAL package was created by a *UoE* medical student (*CJG*), supervised by faculty staff, to promote understanding of the thyroid gland in health and disease during the MBChB2 E&D module. The thyroid CAL package has since acted as a template to create new student-authored calcium CAL (*RM-M*, *SV, MB*).

Student evaluation of E&D CAL and lessons learned

Student evaluation of the E&D CAL suite, including the thyroid CAL package, was sought via on-line questionnaires (in 2015, 2016, and 2018) comprising Likert scale questions and free text responses. The experience of the student and staff CAL co-creators will also be discussed.

***Figure 1*:** Example of graphic-design image
Image later animated and used in 'drag and drop' question



Methods

CAL Production

- **Content:** Synthesised from MBChB2 E&D module core materials, following *UoE* MBChB [3] and UK Society for Endocrinology [4] *LOs* with student and staff peer review
- **Questions:** Integrated throughout the CAL to stimulate user attention and promote self-assessment
- **Animations:** Student-designed anatomical and biochemical animations and graphic design images (e.g. ***Figure 1***) were implemented by the *UoE* Interactive Content team
- **CAL Software**: Edinburgh Reusable Object Sequencer (EROS) [5] software was used to create each CAL tutorial, hosted on Edinburgh Medical School's (historical) intranet, EEMeC [6]

Assessment of the CAL suite

- Ethical approval for audit was granted by the *UoE* MVMSEC Educational REC: 2015/4 and 2016/10
- Questionnaires were hosted on Online Surveys [7] (formerly Bristol Online Survey) in 2015 and 2018; and EEMeC in 2016

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Results

The cumulative results of the audits in 2015 (*n*=22), 2016 (*n*=45) [8] and 2018 (*n*=21) regarding thyroid CAL are presented here:

- All student user respondents (*N*=88) rated the thyroid CAL package as '*Good*' or '*Very Good*'
- Students reported that the CAL package is interesting, logically organised, user-friendly, and helpful for reinforcing key *LOs*
- Since 2017, the Edinburgh MBChB has included a clinical E&D attachment in Year 4. Year 4 students support the use of MBChB2 E&D CAL for revision of basic biomedical sciences material on clinical rotation (*n*=4, 2018 audit)

In addition to high student user satisfaction, student CAL authors and staff supervisors benefit from CAL co-creation (***Figure 2***).

***Figure 2*:** *Student* and staff comments regarding CAL co-creation

"My involvement has made me appreciate the value of teaching as an effective method of learning" (SV)

"Making information more accessible is at the heart of CAL. I believe student-led CAL is vital in achieving this" (RM-M)

"Mentoring junior students not only allows me to update my understanding of key biomedical topics, but also prepares me to teach and support others – vital skills I will use from August as a doctor" (CJG)

"Working with students to create CAL has been very rewarding, and I've learnt a lot from them! Student users appreciate the student insight, and faculty review ensures high standards" (SDM)

Conclusion

- The student-authored thyroid CAL package was equally well-received as its faculty-authored counterparts
- Students benefit from both using and creating CAL content
- Staff enhance their teaching skills in CAL co-creation, and learn which taught areas require extra focus and clarification
- Although our student-authored CAL is firmly rooted within the Edinburgh MBChB, the integral CAL principles of breaking down complex subject material, allowing student control of the pace of learning, and providing additional routes to achieving core *LOs* are likely to be applicable across the *UoE*

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