

Fantastic Learners and Where to Find Them

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1. Formative Assessment: Assessment FOR Learning

The known benefits¹:

- Associated with promising learning gains, when timely, effective and meaningful feedback is provided.
- Guides and shapes educator's practice, in real-time.

My questions:

- Can formative assessment be used to encourage students to engage with their studies regularly and in scheduled hours?
- Can formative assessment help learners becoming **FANTASTIC LEARNERS**, by supporting them in identifying alternative learning strategies that are better matched to their individual learning process?

2. Methods

- Embryo to Organs (DB3504), 30-credit third year course (undergraduate), 10 students.
- A range of formative assessments implemented, including online OMBEA polls, group escape room activities and a model building exercise.
- Formative assessment sessions (with the exception of OMBEA polls) delivered at the end of each block of teaching.
- "Open book", to mimic current exam conditions and to ensure authentic assessment.
- Students always asked to work in groups.
- Given the limited number of students, extensive feedback was provided verbally and in real-time to all students.

3. Model Building Exercise



9 students



90 minutes



Scan the QR code to see models from students

WHY: The study of developmental biology can be very challenging, due to the abstract and ever-evolving nature of developing organisms. Model Building exercises are particularly useful as they encourage students to give a shape to their thoughts.

HOW: Working in groups of three, and using modelling clay, students were asked to build models representing expression of genes driving early Drosophila development. Models were then used by each group to illustrate various morphogenetic events of Drosophila development to the other groups.

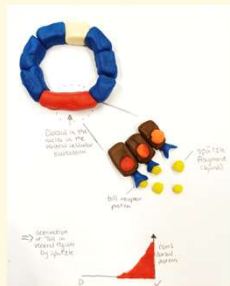


Figure 1. Model illustrating the molecular mechanisms underlying dorso-ventral patterning in Drosophila development.

4. Digital Escape Rooms



9 students



90 minutes



Scan the QR code to see escape rooms

WHY: Digital Educational Escape Rooms have acquired popularity in recent years; as most game-based learning, they create an opportunity for active learning, increasing engagement while enlivening the classroom experience².

HOW: Working in groups of three, students were given a scenario to escape; their final lock was the answer to a question on Drosophila development. To get the passcode to open that lock, students were asked to solve a set of 10 problems, designed not only to test knowledge (factual), but also to test critical thinking and the ability to apply knowledge to solve scientific/research questions. Each lock the students opened provided them with a message. Students were asked to collect the messages, which they would then use to collate an answer to the final lock and escape.

5. What did students think?

" [...] the formative assessments allowed us to **break away** from the monotony of lectures and **really engage** with the content."

" [...] we got to consolidate all the information we had been learning about in **fun and engaging activities** and we had the chance **work with our peers** and help each other out."

"In order to effectively revise the content, I feel getting tested so soon after the content being delivered allows us to really identify where we should focus our studies. It also **helps prepare us for the content still to come.**"

"The formative assessment was creative and extremely rewarding. **It inspired ideas for future study methods**, it got the class to engage effectively with each other and the professors, **it got us thinking, not just mindlessly working** through notes and papers we may not fully understand."

"**It challenged us to apply** what we had learnt and pinpoint what we don't know/don't fully understand."

"I would have liked even **more [formative assessment] sessions**"

6. Conclusions

- Students' feedback confirmed they found the range of activities proposed very useful, challenging and engaging.
- **Students highlighted that the sessions did help them in keeping up with content and understanding how to apply the knowledge gained.**
- **Students also commented they found activities such as the model making exercise "inspiring [...] for future study methods".**
- Overall, students highlighted they would like more regular formative assessment sessions, also in other courses.
- Feedback (not shown) highlighted that students much prefer original assessment methods, that allow them to apply their knowledge, to traditional assessment methods (e.g. OMBEA MCQs).

7. Considerations

- Can this be scaled effectively to larger groups of students? How can feedback be provided effectively to a larger cohort of students? Will multiple educators be required?
- Workload issues, both from the students point of view (extra sessions to attend) and from the educator point of view (significant time needed for preparation).