

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, 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 (see example in **Figure 1**) were then used by each group to illustrate various morphogenetic events of Drosophila development to the other groups.

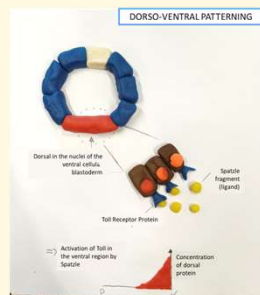


Figure 1. Model illustrating the molecular mechanisms underlying dorso-ventral patterning in Drosophila development.

4. Digital Escape Rooms



9 students



60 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).