Best practices for Online Teaching in Evolutionary Biology

On **June 7 2021**, Maurijn van der Zee and Bart Pannebakker organized a roundtable to share best practices for "*online teaching in evolutionary biology*". Ten participants engaged in lively discussions and shared useful teaching formats, online platforms and resources for online teaching. To make these accessible to everyone on the NLSEB website, we here provide a list of recommendations and tools:

Engaging students in online teaching

- It is key to **create a safe environment**, where students are willing to engage in discussions and answer question, and where they know it is okay to "fail" or to not know the answer. For this, it helps to explain the procedures in advance.
- Ask students to keep their **camera on**, and/or to participate in the chat.
- **Open questions and polls** are good to activate students; polls allow for all students to participate, while asking individual students (e.g. randomly by name, or by inviting answers) allows for direct interaction.
- Make **slides that invite interaction**, e.g. with mainly figures and then ask students to explain what they see
- Use **break-out rooms** (e.g. in Zoom / Teams) to encourage discussion in smaller groups, but start and finish with plenary sessions to encourage feeling part of the group

Which platforms are used for online teaching

- Having support for a platform is vital for its successful use in your courses.
- Try to use one platform for consistency, but social interactions sometimes works better through a different platform.
- Teams / zoom / virtual classroom / brightspace / blackboard are used for digital learning environments
- Perusall is a good tool to read texts together: it allows students to markup PDFs and ask questions on the PDF.
- Mentimeter / Poll Everywhere for online polling
- Gather.town / Discord as alternative for breakout rooms and for virtual hang-outs
- Slack / Whatsapp for project communication for teams of students
- ANS / Testvision / Remindo for online examination
- For an additional list of platforms, check: https://educate-it.uu.nl/toolwijzer/

Resources used in teaching Evolutionary Biology

- Shiny: to run R applications online. A nice population genetics app is Allele A1 to simulate population genetic processes. A community-run collection for Shiny apps for population genetics can be found here.
- Labster: (paid) interactive video and quizzes on laboratory techniques (PCR etc).
- Netlogo: agent-based modelling to create and adjust models and have students run them online.
- Populus: evolutionary modelling to teach population biology and evolutionary ecology
- Jupyter notebooks: good for coding instructions in python/R etc; can be used in a web browser while running on a computing cluster.
- YouTube: CrashCourse / SciShow / Amoeba Sisters / Minute Earth / Genomics Boot Camp with the online, free book / online genetics course
- Publishers websites also offer content on the books we use (Sinauer/Wiley-Blackwell)
- University libraries can provide access to some e-books used in your course (e.g.: Freeland – Molecular Ecology).