

Chatbots for accessing student voices?

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Student feedback not representative

Student Representatives in Student-Staff Liaison Committees (SSLCs) are often not representative of the average student. They are a small subset of students that are:

- Outspoken
- High-achieving
- Engaged
- Confident

Student feedback not representative

When Student Representatives are asked about the lack of feedback engagement from fellow students they report that many students are:

- Too intimidated to speak up during or after class
- Too intimidated to directly contact staff
- Too intimidated to post questions on discussion boards
- Not available for live feedback sessions (e.g. SSLC meetings)

So many student voices are not being heard, which impedes representative student voice initiatives

Accessing a wider student voice

How can we rectify this without putting additional strain on over-extended staff?

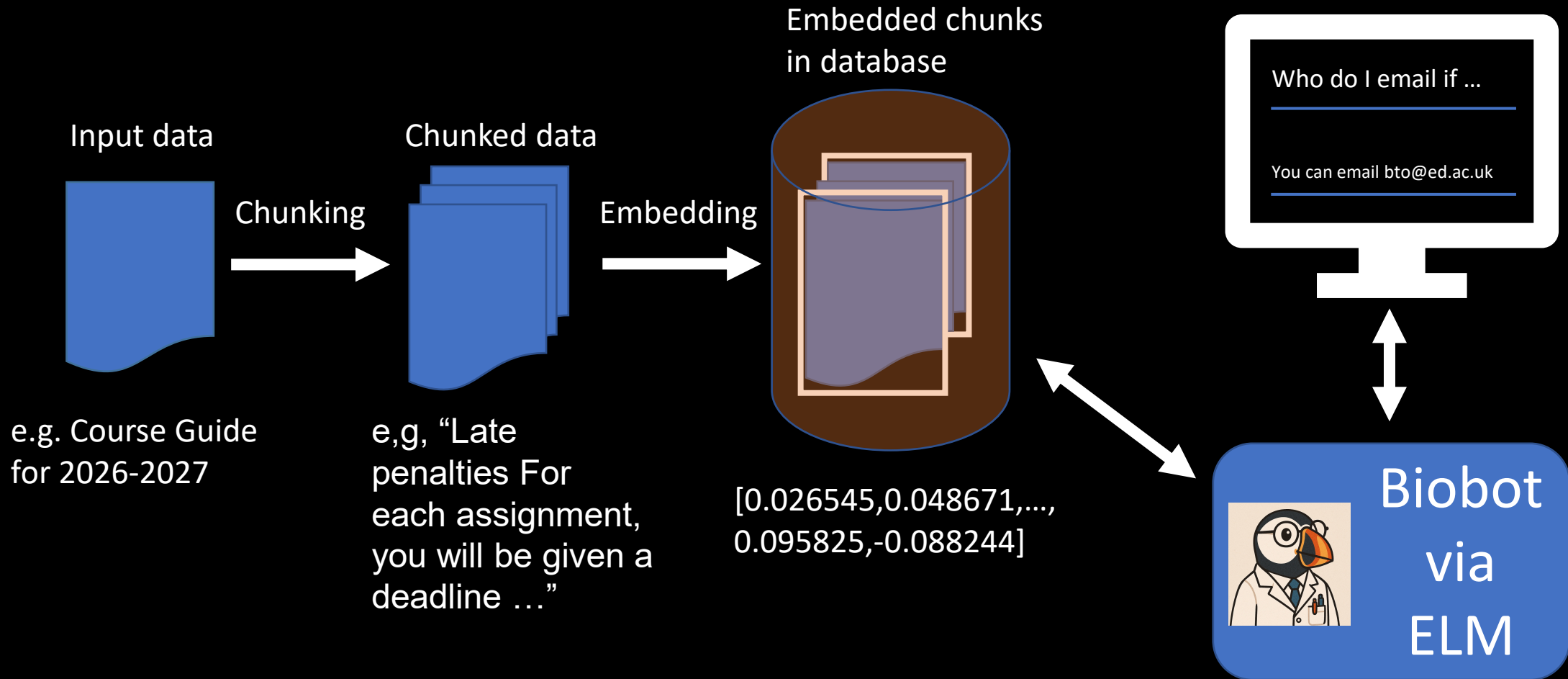
We may be able to tackle this by with course-specific chatbots, which students report are less intimidating to engage with, to capture students that:

- are too intimidated to ask questions
- need access outside of regular work hours
- are not confident in English-language discourse

Confidence in English (example from student query to chatbot)

"I never considered the factor of language, a barrier when someone is studying abroad. I was overconfident of my English communication skills, but when I couldn't find the correct words to share my ideas with my peers, I realized that I lack of this ability. ... Seeing my classmates formulating clear answers and share it with us so fast, made me felt ashamed and stupid. I'd to think the question, translated it to English and then make the sentence valuable. As we mostly run out of time, we tend to be very quickly, and that's makes me nervous and finally I don't participate"

What is a chatbot?



Biobots – SBS course chatbots

Should be able to:

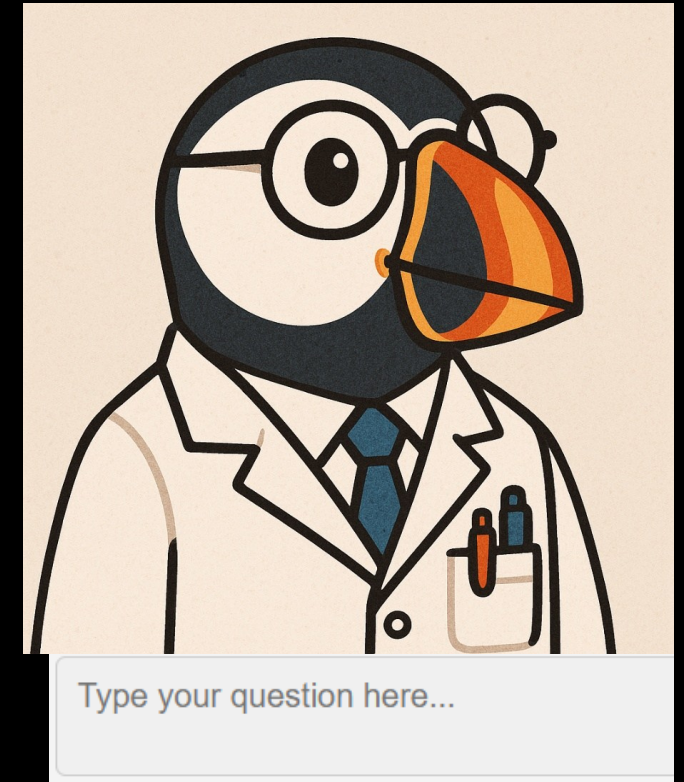
- **Answer Questions:** Provide information on topics covered in the guide such as course details and timetables
- **Offer Guidance:** Help students navigate university procedures, like requesting group changes or understanding assessment regulations
- **Provide Contact Information:** Direct students to relevant contacts for specific queries or support needs
- **Explain Policies:** Clarify university policies on academic misconduct, data protection, etc.
- **Assist with Resources:** Guide students to additional resources, such as mental health support or study skills workshops



Biobots – SBS course chatbots

Biobots:

- Are designed to answer questions based on specific sources (course guidebooks, lecture slides, journal papers)
- There are two different ways in which biobots will act:
 - 1. information-retrieval (for course guides and lecture content) and,
 - 2. tutor (for lecture content)
- Housed on secure machines
- Anonymous with “zero-data-retention” policy
- Provides clickable hyperlinks
- Works in multiple languages



Human Evolutionary Genomics 4 biobot



Hi! I'm HEGbot (BETA)!

I'm a friendly AI assistant that's here to help you with Human Evolutionary Genomics. I will help answer your questions. Select which topic you want information on to get started. Note that your chat will be lost if you navigate away from the page, refresh the page, or click on a different topic, so make sure to copy important parts of our conversation somewhere to save them.

Select Topic

Please choose a topic

Please choose a topic

Course Guidebook

PopGen Tutor

Week 1: Paleo-Omics

Week 1: Neanderthals

Week 1: Denisovans

Week 3: Biased gene conversion (Duret 2009)

Week 3: Mutation rate and age (Kong 2012)

Week 3: Selection strength and pop size (Nam 2017)

Weeks 4, 5 and 7: Inferring archaic admixture, population structure and history

Weeks 6: Advanced_methods_and_New_Insights

Weeks 6: High_Coverage_Genomes

Weeks 6: Who_really_were_the_Denisovans

Weeks 6: Genealogy_of_modern_human_populations

Weeks 6: Early_out_of_Africa_events

Weeks 7: Did novel genes make modern humans

Weeks 7: Did protein evolution make modern humans

Weeks 7: Ancient sweeps in the modern human lineage

Weeks 8: Selective sweeps

Weeks 8: Soft sweeps and recent selection

Type your question

Please be aware that due to the nature of this technology, responses may include inaccurate, fictitious or completely wrong information. Anonymised messages and responses may be used to monitor performance of this application. By using this application you agree to use of this conversation for performance monitoring.

Biobots – course overview (7 of 38 SBS courses)

Bot	Course	Year of Study	Number of students	Type of chatbot	Queries (Total: 2645)
BioBot	BTO Essential student guide	All years	~1100	Information retrieval	11
bio1aBot	Bio1a: Variation (BILG08020)	1	~250	Information retrieval	552
bio1bBot	Bio1b: Life (BILG08021)	1	~250	Information retrieval	481
ge2bot	Bio2b: Genetics and Evolution (BILG08025)	2	~374	Information retrieval	785
eeg3rbot	Evolutionary and Ecological Genetics 3 (BILG09004)	3	~66	Information retrieval and tutor	218
pabio3bot	Pathogen Biology (BILG09022)	3	~40	Information retrieval	43
hegbot	Human Evolutionary Genomics (EVBI10010)	4	~14	Information retrieval and tutor	292
eccbot	Evolution and Climate Change (ZLGY10023)	4	~28	Tutor (single journal article)	263

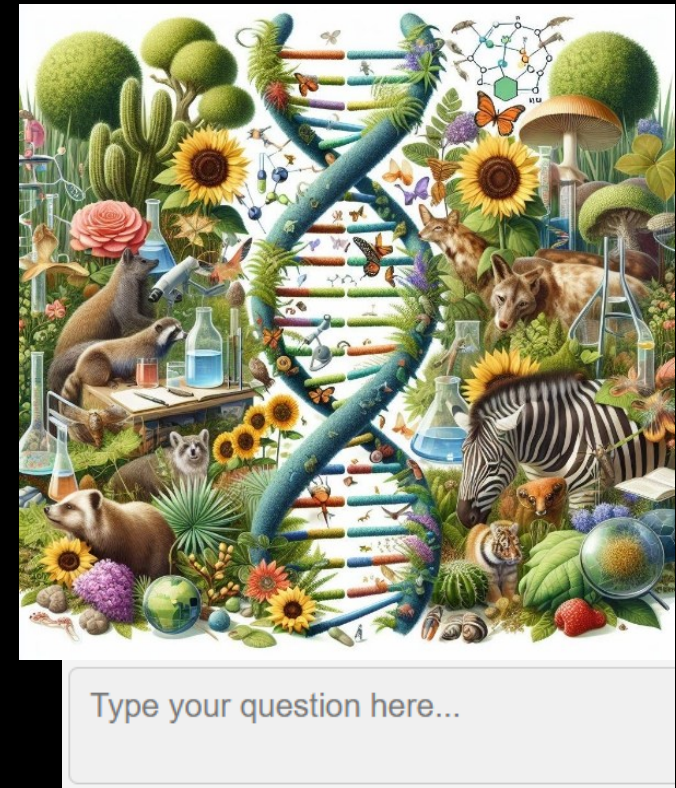
Bio2bot analysis (785 queries)

Top chatbot questions:

- can i have a cheat sheet for the exam?
 - **Biobot response:** course guide does not specify
- do i need to attend the workshops/practicals?
 - **Biobot response:** the course guide indicates that the workshops/practicals are an important part of the Bio2B course
- can you give me a list of assignment deadlines?
 - **Biobot response** includes the list with dates and weightings
- should i be doing weekly reflection tasks on the portfolio?
 - **Biobot response:** portfolio in Bio2B involves submitting a welfare check and a draft, as well as a final submission.

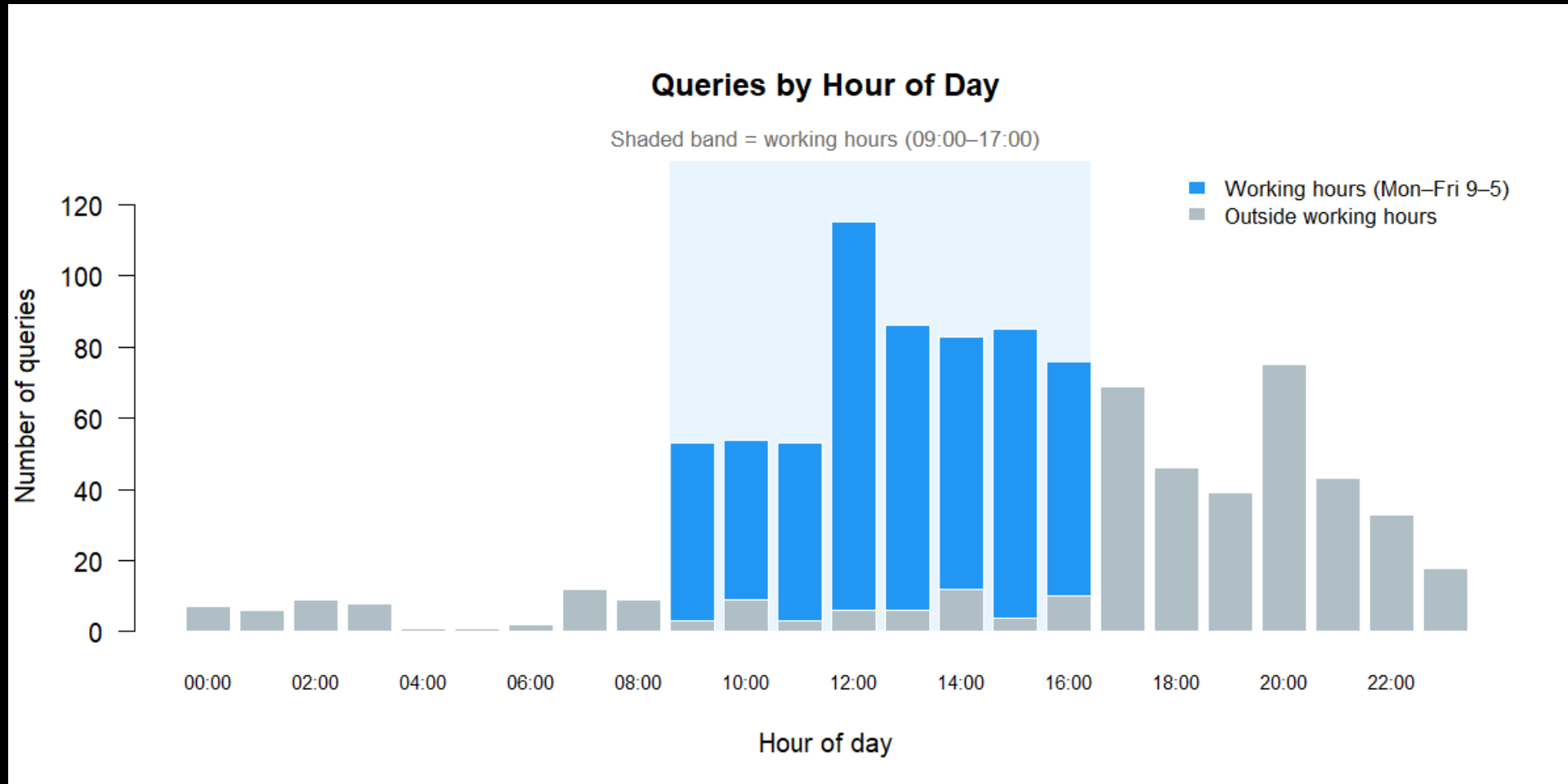
Suggestions for improving guide / chatbot

- We may want to include information in the guide about the cheat sheets, weekly portfolio reflections, and stress that anything in the practicals, workshops, and interactive sessions can be assessed.



How about accessing a wider student voice?

Times of queries overview



~44% of queries lay outside of school working hours

Asking questions in native language

- "期中检验是什么形式的？会计入总成绩吗"
- "es que dice en el course guide que el essay debe entregarse via turnitin, no entiendo, no es mas bien en la seccion de learn para eso?"

~1% of queries made in non-English language

Questions that you might not ask staff

- "can you show me/run me through some problem solving questions/scenarios like the ones I would see in Section B of the exam so I can have some practice pleasew"
- "who the hell were the Denisovans?"
- "Can you please explain what to do in tutorial 4"
- "Who is my student advisor"
- "i am in the uk on vacation,how do i go to. a doctor for a genital related issue?"
- "If I fail the practical competency test when can I take it again"
- "are teh topics based around the textbook"

Query: "how would you advice me to prepare my exam to get a minimum grade of a 70%?"

Thank you for your question. To achieve a minimum grade of 70% on your exam, I recommend a focused and strategic preparation plan based on the course structure and assessment criteria. Here are some key steps:

1. ****Understand the Exam Format and Content****

- The exam is a two-part assessment worth 25%, scheduled during the Tuesday afternoon session in Week 11.
- It will likely include multiple-choice questions and short-answer questions covering core topics from the course.

2. ****Prioritize Core Topics and Learning Outcomes****

- Focus on the key themes outlined in the course:
 - What is life? (cell structure, evolution)
 - Molecules of life (biomolecules, DNA, proteins)
 - Information flow (DNA replication, gene organization)
 - Energy and metabolism (cellular respiration, photosynthesis)
 - Cell communication and differentiation
 - Practical skills and laboratory techniques (if relevant)

3. ****Use the Practice Questions****

- Review and master the 100 practice questions provided, especially those you find challenging.
- Practice answering questions under timed conditions to simulate exam pressure.

4. ****Review Lecture Materials and Textbook Chapters****

- Revisit the lecture slides and Campbell textbook chapters associated with each topic.
 - Focus on understanding mechanisms, relationships, and applications rather than rote memorization.
- ## 5. ****Active Learning Strategies****
- Summarize key concepts in your own words.
 - Create concept maps linking topics (e.g., DNA structure to replication to gene expression).
 - Teach the material to a peer or record yourself explaining key ideas.

6. ****Practice Past or Mock Tests****

- If available, attempt past exam papers or mock tests to familiarize yourself with question styles and timing.

7. ****Identify and Address Weak Areas****

- Use your practice questions and mock exams to identify topics where your understanding is weaker.
- Review those areas intensively, using additional resources if needed.

8. ****Plan Your Study Time Effectively****

- Break down your revision into manageable sessions, focusing on different topics each day.
- Allocate more time to topics with higher weightings or those you find difficult.

9. ****Prepare Logistically****

- Ensure you know the exam logistics, what to bring, and the rules (e.g., no open book).
- Rest well before the exam day and stay hydrated.

10. ****Stay Positive and Confident****

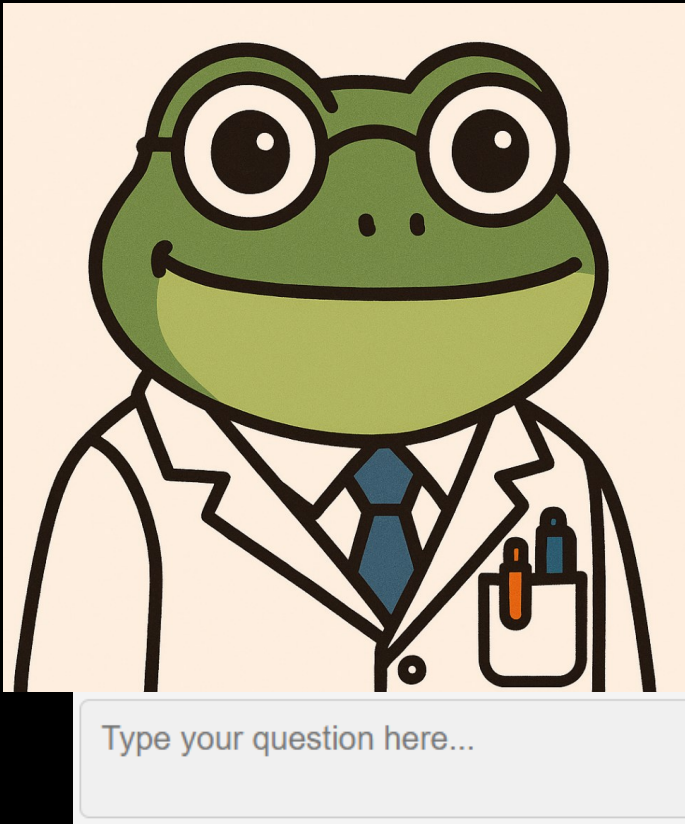
- Confidence can improve performance. Trust your preparation and approach the exam calmly.

Future of chatbots for accessing student voice

Develop chatbots that are (just) designed to gather student feedback, which may:

- Reduce administrative burden
- Capture students that are too intimidated to ask questions (e.g. are anxious / lack confidence in English)
- Capture students that are more capable of engaging outside of school working hours (i.e. not during SSLCs or End-of-course feedback sessions)

Is it worth it?



Costs to School:

- Biobots query total cost = £2.46

Costs to students:

- Promotes cognitive offloading / Gen AI dependence
- May distance them from needed support

Costs to society:

- Contributes to environmental destruction
- Supports unethical corporations / practices

Thanks for listening!



Sign the Open Letter to
End the University of
Edinburgh's Contract
with OpenAI

ECCbot: Paper discussion

In this week's paper discussion we are going to interrogate a paper on genomic signatures of adaptation using a custom built chatbot and critically analyse the responses. The main objectives of this exercise are to:

1. Understand how genomic signatures of adaptation can be discovered in practice, and
2. Understand the utility and limitations of Gen AI in interrogating a scientific paper.

nature ecology & evolution

Article

<https://doi.org/10.1038/s41559-024-02514-5>

The genetic architecture of repeated local adaptation to climate in distantly related plants

Type your question here...

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Below are the questions for interrogating Whiting et al. 2024. It is important that you (in small groups of 2 or 3) record your answers to these questions and as well as to your own follow-up questions. We will **attempt to verify or falsify the responses** together during our live session.

1. What is the aim of the Whiting et al. 2024 study?
 - a. Follow-up question: what are gene families?

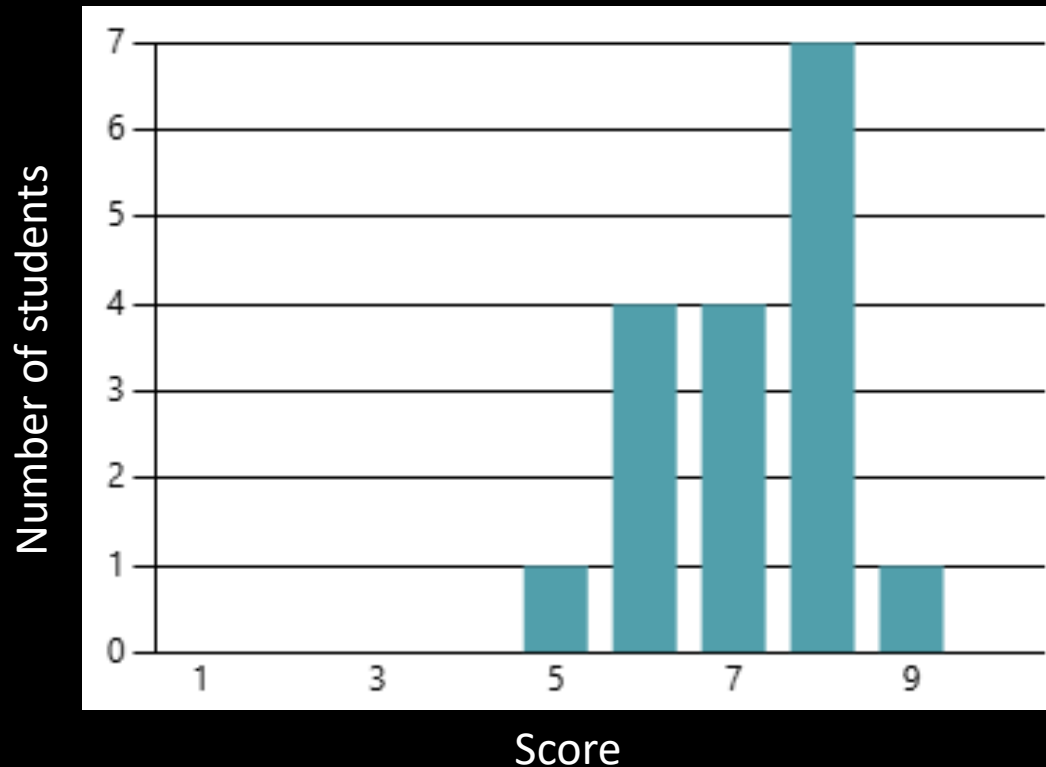


Developing critical
analysis of Gen AI

ECCbot: Paper discussion

On a scale of 1 to 10 (where 10 is the most helpful), how useful do you think this exercise was in helping you understand this paper?

Average score: 7.18



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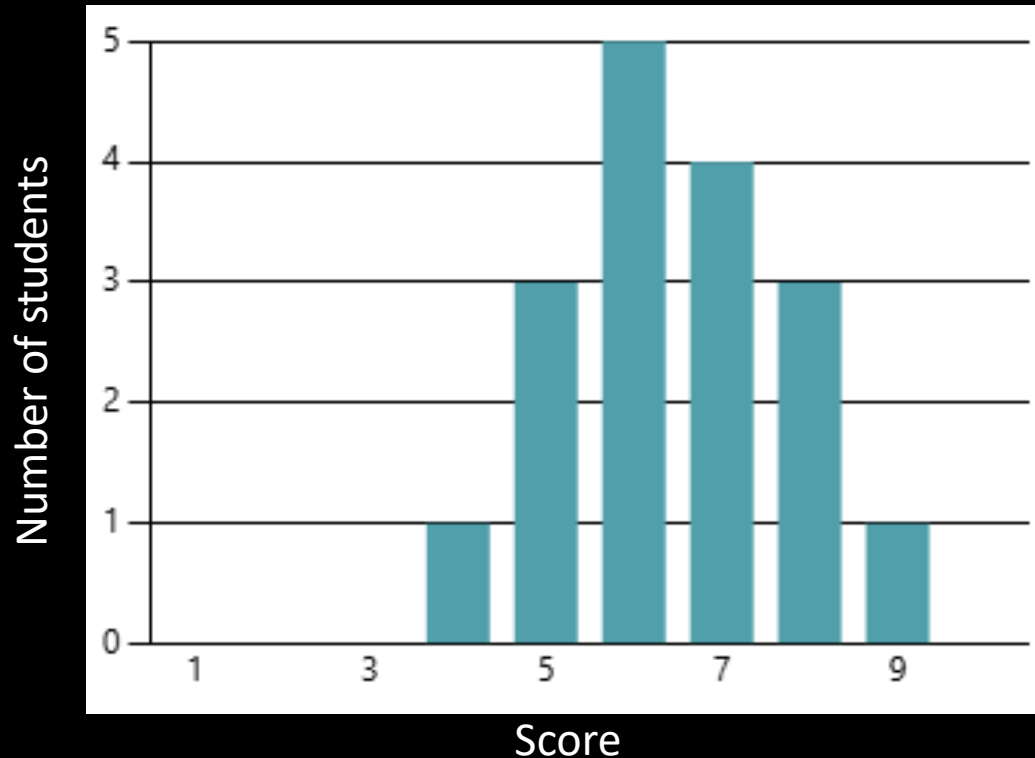
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ECCbot: Paper discussion

On a scale of 1 to 10 (where 10 is the most useful), how useful do you feel ECCbot was in helping you understand genomic signatures of adaptation?

Average score: 6.47



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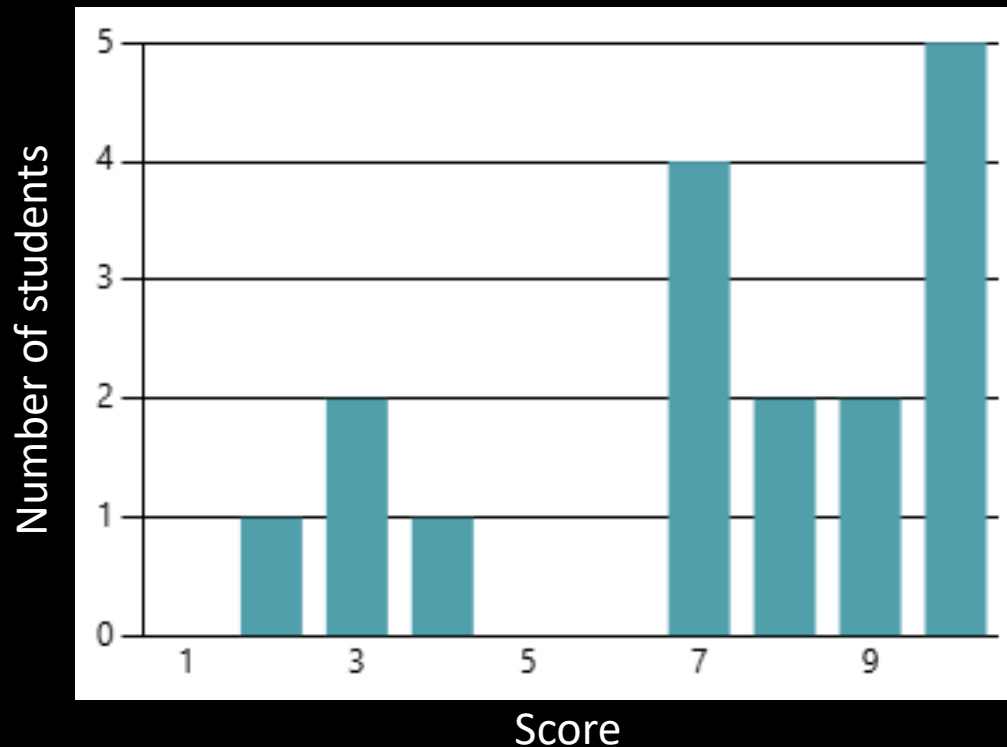
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ECCbot: Paper discussion

On a scale of 1 to 10 (where 10 is the most interested), how interested would you be in using more specialised chatbots (like ECCbot) to investigate papers?

Average score: 7.29



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