

Assessment in Bioethics Teaching

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Based on experience with a 10 credit final year module (Social Impacts of Biology, BIO3015) that is compulsory for ~120 students drawn from three degrees: Biology, Applied Biology, Zoology.

- What should we assess?
- How should we teach what we assess?
- How should we assess that?
- Can the assessment be accurate, reproducible and fair?

1. What should we assess?

QAA Biosciences Benchmark implies reasoning
 (“...engage in critical assessment and intellectual
argument...” “...consider viewpoints other than their
own....”).

There is no other feasible way to assess students abilities
in bioethics. [Does testing reasoning test ethics? See
slide at end.]

Wish-list of intended learning outcomes:

- organisation (of thinking and expression)
- analysis
- facts (those essential for the case made)
- value judgments
- reasoning
- clarity, conciseness, coherence.

Do students achieve all this? The best can do this pretty well and the worst at least try.

2. How should we teach what we assess?

Examples and practice.

The most vital step is to persuade students to think self-consciously, analytically and critically.

Also, they should practice in a context where (after appropriate preparation) they learn (in seminars) to find the answer in their head.

Give some basic ideas and instructions, and examples (in interactive lectures) and provide structured practice (in seminars) and feedback.

3. How should we assess?

Set tasks that only focus on ethical reasoning.

Need to give practice.

- Work written in 3 seminars for practice (3 x 10%).
- Answers written in 1.5 h examination:

Section A

Questions relate to particular sessions in the module.

1 question out of 4 (45 min) (35%).

Section B

Questions not deliberately linked to any particular sessions in the module.

1 question out of 3 (45 min) (35%).

Seminars

- 3 x 2 h.
- Prior preparation.
- Discussion in groups (of ~6).
- 2 sides of A4 written in last ~25 min of session.
- Feedback.

Seminar topics

Range from narrow cases to broad, often underlying, issues.

- Saviour sibling
- Golden rice (debate)
- “Consider arguments for and against the idea that the earth would be a better place without humans and draw a clear conclusion one way or the other.”
(This is about “better”.)

Marking notes

There are simple marking notes for the seminar work and both general and question-specific marking notes for the examination questions. The General Marking Notes emphasise the requirement for organised analysis and reasoning. The question-specific marking notes illustrate and comment on points that could be made without specifying any particular approach or answer.

General Marking Notes for the Examination

Key points;

In answers to the section A question, one consideration is the **appropriateness and accuracy of the facts**. However it is equally important that the answer is **well-organised** and clearly explained and that where an **argument** is indicated this is also **clearly explained**.

In Section B the main requirement is for a **well-organised and well-argued case**; the student does not have to know a particular factual area but any facts or surmises relied on should be accurate or reasonable.

In both sections, it is irrelevant whether any conclusion drawn from an argument is one that the marker agrees with or not.

Section A question

Outline the legal requirements of current legislation that controls experiments with animals and identify and comment on the underlying ethical principles. Discuss to what extent this legislation could be a model for how we treat animals outside experiments.

Section B questions

Explain whether or not cultures of human cells, such as stem cells, should be given the same ethical consideration as humans.

Imagine that the tusk of the almost extinct Borneo zebra provides an effective treatment for AIDS. Removal of the tusk is lethal. There are just enough Borneo zebra to cure 10% of people in Africa with AIDS. The Borneo zebra cannot be farmed. There is a strategy to prevent the extinction of the Borneo zebra but it will take ten years to be effective and nobody is sure it will work. Explain what we should do.

[The Borneo zebra is not real, and anyway is not a true zebra.]

Example question-specific marking notes (section B)

Conflicts of interest include: (1) the Borneo zebra, its fate as a whole and as constituent individuals, versus the human desire to help human sufferers of AIDS; (2) whether we help people alive now, versus the possibility of help to future generations if we wait.

Issues that may arise: Do humans have a supervening duty to avoid causing extinctions ? **In what way will the Borneo zebras be harmed if the species becomes extinct by dying of natural causes?** How does one balance ones duties to a finite number of people alive now against a potential benefit to an unknown number in the future?

These will relate to deeper questions possibly including:

- use- and non-use value;
- about existence: whether and **in what way the existence or not of a species (as distinct from its individual constituents) should be an issue**, and that **existence as such is not a benefit** to the individual concerned (human or animal), though avoiding suffering leading up to death, is;
- about **balancing welfare benefits against other types of consideration** (fairness, autonomy).

4. Can the assessment be accurate, reproducible and fair?

Broadly, yes:

- Students do as well in this module, and discrimination is as good, as in others.
- Marks for examination answers are reasonably reproducible when second-marked.
- The overall mark is derived from 5 pieces of work, the first three of which receive feedback.

Discrimination

Overall mark in the bioethical and cellular modules in 2007/8

	mean	SD	med	Mini#	Max	n
Bioethical	60.3	6.0	61.0	45	80	107
Cellular	60.7	7.7	62.0	50	83	35

Fails excluded

Marks for individual questions in 2007/8.

	mean	SD	med	min	max	n
Bioethical module						
Section A questions	60.2	8.6	61.0	30	85	108#
Section B questions	60.7	10.3	60.0	29	90	108#
Cellular module						
Data interpretation	58.9	14.0	59.5	20	80	36
Essay questions	57.8	12.3	56.5	25	90	70#

Pooled from several questions.

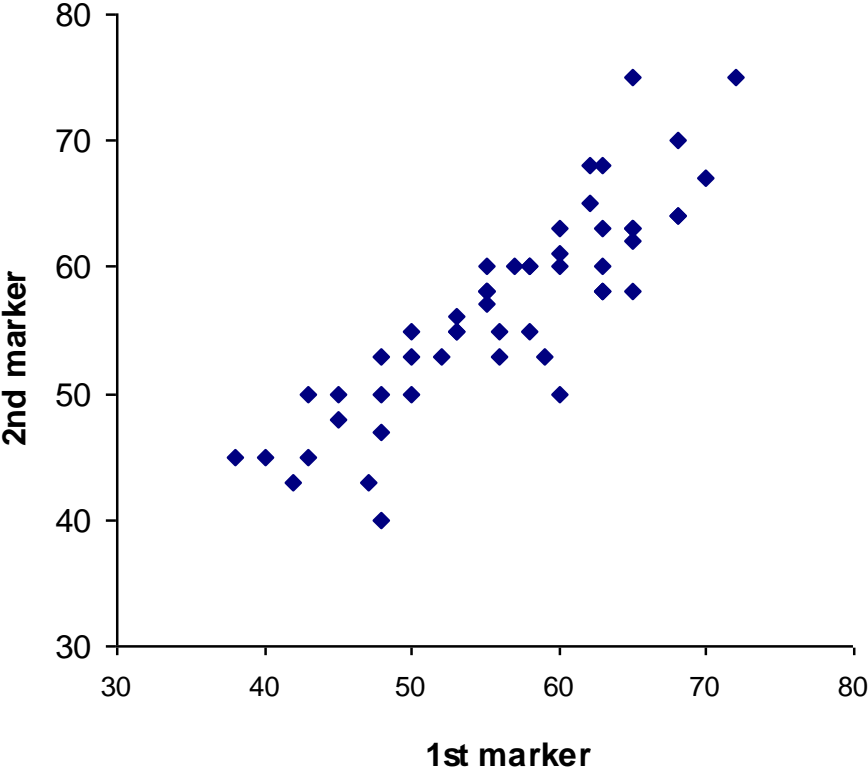
Percentage class distributions in 2007/8

	F	3	2ii	2i	1	Min (%)	Max (%)	n
Bioethical module								
Seminar work	0.0	6.4	32.9	47.3	13.4	40	85	313
Exam Section A	0.9	9.3	31.5	49.1	9.3	30	85	108
Exam Section B	2.3	9.3	27.8	46.3	13.9	29	90	108
Cellular module								
Data interpretation question	5.6	16.7	27.8	22.2	27.8	20	80	36
Essay questions	4.2	14.1	40.8	26.8	14.1	25	90	71
Whole module marks								
Bioethical module	0.9	9.3	34.3	55.6	4.6	34	80	108
Cellular module	2.8	11.1	36.1	41.7	8.3	25	83	36
Biotechnology module	0	6.5	51.6	29.0	12.9	40	81	31

Are the marks less accurate in this subject than in others?

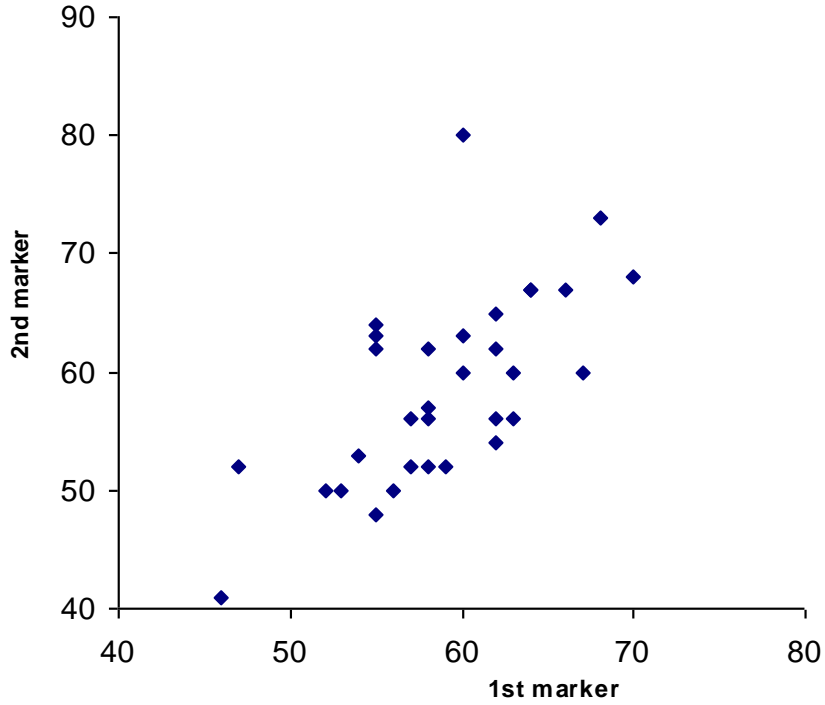
Pre-moderation double-marking data from 1997.

Bioethics examination questions

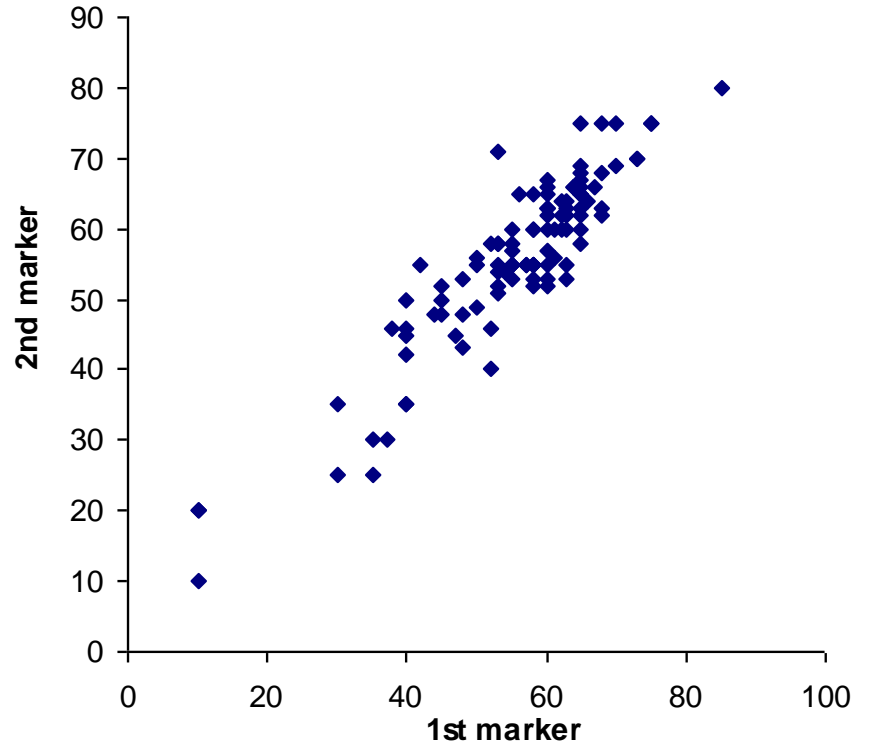


General Paper (essay questions)

Pre-moderation double-marking data from 1997/8.



Pooled plant & animal modules



On the other hand, we have a problem of reproducibility in the marking of the seminar work (based on samples).

- It is vital to give students useful feedback.
- The seminar marking is split between 5 markers. Markers agree on the good and bad points but weigh the components differently in coming to an overall mark. It is not possible to write marking notes to conclusively overcome this.
- We realise that the markers must communicate and discuss examples regularly.

Summary

We should foster and assess reasoning.

Ideally, this should include practice under conditions where students write from the ideas and knowledge in their heads (informed by preparation), and galvanised by the promise of a mark.

The assessment discriminates between students of different ability, is fair, and examination marks are reproducible.

Does testing reasoning test ethics?

It's the only bit we can foster and test:

- I cannot tell for certain if someone will make the right decision in a real-life situation.
- Nor if their expressed intention is made in good faith.
- In any case none of us claim to know all the answers.

On the other hand:

- No ethical judgement is possible without reasoning.*
- We can give guidance and practice in ethical reasoning and we can assess it.
- The key component is a value judgement. These are essential in ethical reasoning. In good ethical reasoning the value judgement is explicit and a good case is made for it. Facts are also involved.

[*In a hurry we make a judgement as best we can and worry later if it was right.]