

Physics

Module:

Physics students working on the project focused on foundational undergraduate modules.

Learning outcomes:

Learning outcomes for these modules can include:

- *Solve elementary problems in mechanics and heat*
- *Design and execute experiments to measure mechanical properties*
- *Use conservation principles to constrain the solution of physical systems*
- *Present experimental data clearly in tabular form*

Current Assessment Design:

In physics, as is the case across the sciences, students are assessed by graded **formative assessment** which includes the completion of practical laboratory work, followed by the assemblage of data collected into lab reports. Laboratory work varies in content depending on the theoretical subject matter being covered at the time. This laboratory work can also be classed as **authentic assessment**, given the nature of the experiments conducted.

There is also a **summative assessment** element, in the form of written examinations.

Associated Risk of GenAI:

In general, the hands-on nature of assessment design in the sciences has a low risk of academic misconduct through the use of GenAI.

Assessment Task:

Laboratory reports were focused on for the purpose of this project as the form of assessment most open to the use of GenAI.

After completing the practical laboratory, students are usually instructed to write a laboratory report.

A laboratory report consists of:

- A procedure, where the steps taken to complete the lab are comprehensively detailed
- The results obtained by practical work during the lab.
- A discussion, where the theory behind the lab and all the theoretical information that may be relevant to that lab is provided
- An error analysis section, that includes any errors found in measurements etc.
- A conclusion that sums up the experiment.

Breakdown of Process:

Given the fact that a laboratory report is written based on experiments conducted by students, the only step in the process that is open influence by GenAI, in terms of its assessment, is the discussion section. This is usually the most substantive section of a laboratory report, where students address the theory informing their hands-on laboratory work and discuss their processes and observations.

The laboratory report used for this case study was based on an experiment into the interference of ultrasound light and to determine the wavelength of sodium yellow light.

The student used ChatGPT as a study aid and research tool in the writing of the discussion section of their laboratory report. It was specifically used to help clarify certain theoretical elements concerning sound waves, longitudinal waves, and light waves.

Mitigation:

The nature of laboratory reports requires students to weave in the various theoretical elements covered in class to their practical work laboratory work.

The student noted that, while ChatGPT provided reasonably comprehensive answers to theoretical questions, students would still need to adequately interpret these answers, to appropriately relate them back to their practical laboratory work.

Therefore, ChatGPT can be used as a study aid in science subjects, like physics without undermining the intended learning outcomes, given the need for continued critical engagement with ChatGPT outputs.