

CASE STUDY

Addressing Generative AI fear and inertia: A three year ongoing journey

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Abstract

This case study examines changes introduced in an undergraduate statistics course following the release of ChatGPT in November 2022. Our primary aim was to support students in making informed and ethical decisions about their personal use of generative AI (GenAI). Survey data collected from students and teaching staff indicate that both groups are more positive about the ethical and practical implications of GenAI compared to peers within the School of Mathematics and Statistics. For students, greater engagement with GenAI appears linked to reduced anxiety and improved confidence in learning statistics, which may contribute to observed reductions in withdrawal rates. Teaching staff reported increased understanding of GenAI's potential and confidence in their role in guiding students toward its responsible use as a learning aid. These findings highlight the ongoing shifts driven by GenAI and the impact of specific actions taken to support students and staff to incorporate GenAI into students' learning strategies.

Keywords: Generative AI, Learning aid, students, change, retention.

1. Introduction and Background

Since the launch of ChatGPT in November 2022, GenAI has provoked mixed reactions across higher education (HE). Student use of GenAI continues to rise (Freeman, 2025) and reliable detection is acknowledged as challenging (Hardie et al., 2024). Since work by Davis (1989) there has been substantial literature on how to encourage students to adopt new technologies, but GenAI introduced a different environment—one requiring both technological and cultural change—which students have often been quicker to embrace than institutions.

Emerging research explores GenAI's role in HE (James & Andrews, 2024; Grove, 2025), but practical accounts of guiding students in its ethical and individual use remain limited. This paper reports on an initiative, over three years, aimed at encouraging students to critically consider their engagement with GenAI. Students may decide to use GenAI as a study support tool, to help them tackle their formative assignments, or choose not to use it at all.

The context is a distance-learning institution delivering a second-year, 30-credit undergraduate statistics course to approximately 600 students per cohort. Students access printed materials, online tutorials, forums, and assessments via a virtual learning environment (VLE). Teaching is provided by around 30 Associate Lecturers (ALs), each supporting a tutor group of approximately 20 students. A central team set assignments, examinations and design and organise any course changes.

2. Methodology

The delivery model for this distance-learning course relies on teaching by ALs, making their engagement critical to influencing student behaviour. Previous research suggests that lecturers' attitudes toward GenAI are shaped by their own usage and views on learning (Caellos et al., 2024; Kaplan Rakowski et al., 2023). Consequently, to understand ALs' views and practices, the central

team constantly engaged with the ALs through surveys and informal discussions via forums and online meetings.

To support ALs, the central team provided guidance and resources, including examples of GenAI outputs for assessment tasks and optional “second opinions” on suspected misuse. A proforma was introduced for all assignments to encourage students to acknowledge GenAI use and facilitate conversations with ALs. A sustained “nudge” approach (Thaler, 2008) was adopted to build AL confidence and acceptance of GenAI. ALs were formally surveyed twice, with the second survey contributing to a broader survey of ALs across the Mathematics and Statistics school in 2025.

Direct communication with students, by the central team, was higher than usual to provide timely and consistent guidance. Student surveys included participation in a multinational survey in 2024–25 which also included students on two other courses at the University. The proformas provided information on student use of GenAI – both in assignments and as a learning aid when studying course materials.

2.1 In course guidance

Written guidance for students, tailored to the course, was first issued in September 2023 preceding most University-wide guidance. This guidance has been updated annually to reflect changes in students’ engagement with GenAI tools, developments in the tools themselves, and the evolving institutional position. From September 2023, the central team provided recorded tutorials on GenAI use, and for the 2024-25 cohort, students also received a short video of ALs outlining potential applications of GenAI.

All assignments are available on the VLE before the course begins. For the 2025 cohort, assignments included tasks requiring students to critically evaluate GenAI-generated outputs. These tasks were designed to encourage reflection on responsible GenAI use and to enable ALs to formally offer feedback on use of GenAI.

Guidance distributed to students was shared with ALs, alongside additional AL-specific guidance. Confidence and awareness among ALs have grown over time. Currently, the central team provides tutorial materials emphasising the importance of critically verifying GenAI outputs against module content, which ALs use in early tutorials.

2.2 Acknowledging use of GenAI

The October 2023 cohort was permitted to use GenAI in all formative assignments, with an expectation that any use of GenAI would be acknowledged. Acknowledgement proved challenging for students. To address this, a structured proforma was introduced in 2024–25 and refined for the October 2025 cohort (see Appendix one). The proforma now serves to:

- Remind students that GenAI is available and may support their learning in various ways.
- Provide a simple, consistent mechanism for acknowledging GenAI use.
- Offer insight into patterns of student engagement with GenAI.
- Indicate whether ALs are engaging with students about GenAI use.

For the 2024–25 cohort, written feedback based on proforma data was shared with students (Appendix two). For the 2025–26 cohort, similar feedback was presented in graphical form (Figure

1). ALs received comparable information for their tutor groups. This approach aimed to increase transparency, encourage discussion, and reassure students that choosing **not** to use GenAI is entirely acceptable.

2.3 Collection of student and AL views

Asynchronous forums within the VLE are integral for both students and ALs. For students, an additional forum dedicated to GenAI discussions was created for each cohort. For ALs, views on specific aspects of GenAI were gathered through their forum and explored further during live online meetings.

These forums provided informal feedback, complemented by surveys in both the 2023–24 and 2024–25 presentations. Student surveys were anonymous: conducted via the VLE in 2023–24 and as part of a multinational study in 2024–25 (Shaker et al., 2025). This latter survey also included students from a third-year economics course and a large first-year, service-mathematics course, enabling internal comparisons within the university. Additionally, an online focus group with a small group of students allowed deeper exploration of how GenAI supports their study practices.

Tutor surveys were distributed directly to ALs, with results shared and discussed via the AL forum. Subsequent inclusion of some identical questions in an ALs survey across the School of Mathematics and Statistics enabled comparisons of AL perspectives. Other courses in the school, at the time, did not allow the use of GenAI in formative assignments.

3. Results

3.1 Student acknowledgement and differential use of GenAI

Proforma data revealed consistent differences in GenAI usage between qualification groups. In 2024–25, over half of students following an economics qualification reported using GenAI in their fifth assignment, compared with only 20% of students on mathematics/statistics qualifications (Table 1). Across all groups, GenAI use increased as the year progressed, with overall acknowledgement rising from 25% to 35%. For the 2025–26 cohort, even higher levels of GenAI use were reported with 47% reporting use in their first assignments. (Figure 1).

Table 1: Percentage of students indicating GenAI use in assignment: 2024-25 cohort.

	Assignment number				
Qualification group	1	2	3	4	5
Mathematics and Statistics	16%	22%	21%	23%	20%
Data Science	31%	36%	39%	44%	43%
Economics	32%	45%	44%	49%	52%
Open /Other quals.	16%	23%	25%	23%	33%

The proforma was revised for 2025–26 to capture additional detail on how students use GenAI both for assignments and in helping them to understand course materials. Approximately one-third of students reported using GenAI as a study aid (Figure 1) with the highest percentage being amongst

the economics students. Figure 1 also shows that a consistently higher percentage of students, at around half, reported using GenAI in assignments with economics students again being the highest users.

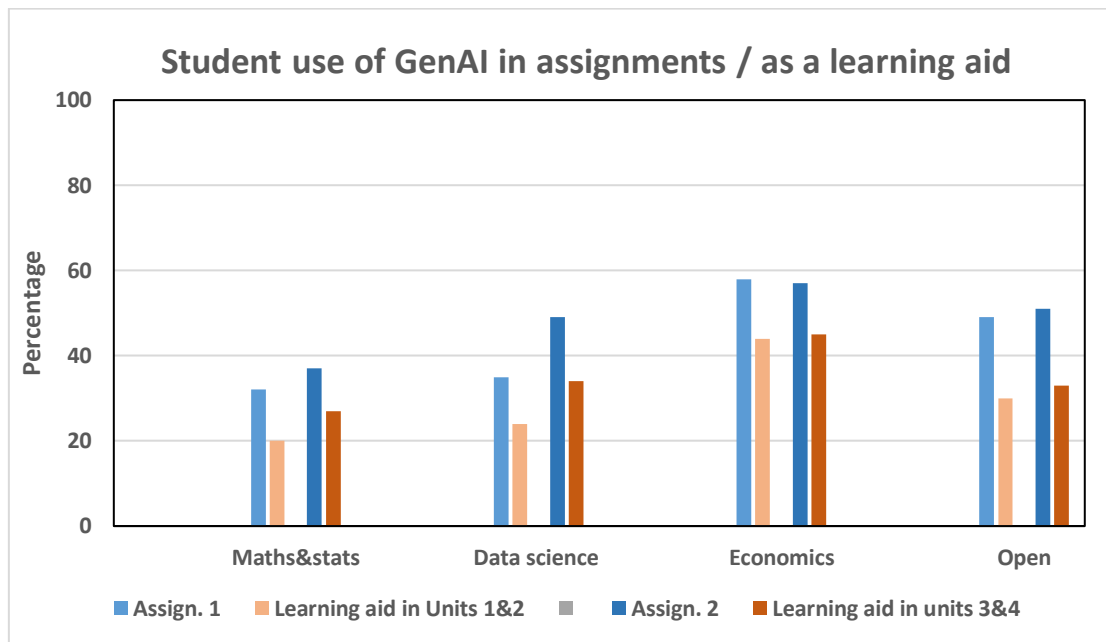


Figure 1: Percentage of students recording use of GenAI in assignments and/or as a learning aid by qualification group: 2025-26 cohort.

3.2 Student increased confidence, decreased anxiety and increased retention

Students on a third-level economics course and first-year mathematics course, as well as those on this course, took part in the multinational survey in 2024-25. This enabled us to compare this course to other similar courses in the university. Students on the other two courses were not permitted to use GenAI in assignments.

Figure 2 shows the higher usage of GenAI on this course and a higher reported increase in confidence as a result of using GenAI. Students on this course also reported a higher decrease in anxiety as a result of using GenAI.

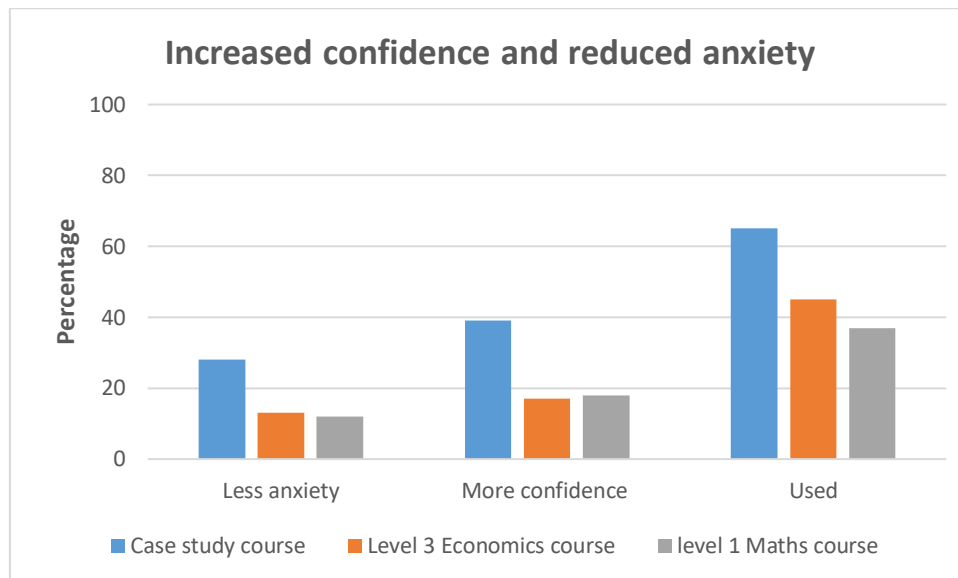


Figure 2: Percentage of students reporting reduced anxiety and increased confidence as a result of using GenAI.

Anxiety and confidence may be linked to performance (Paechter et al., 2017) and this may be a factor in the increased retention observed on this course. The school offers one other 30-credit, second-level statistics module, and one 30-credit applied mathematics course (other courses are 60 credits). Figure 3 shows that retention on this course, compared to the others, was higher in 2023 and 2024. These are the first two cohorts allowed to use GenAI on this course whereas the other courses did not permit GenAI use in their assignments.

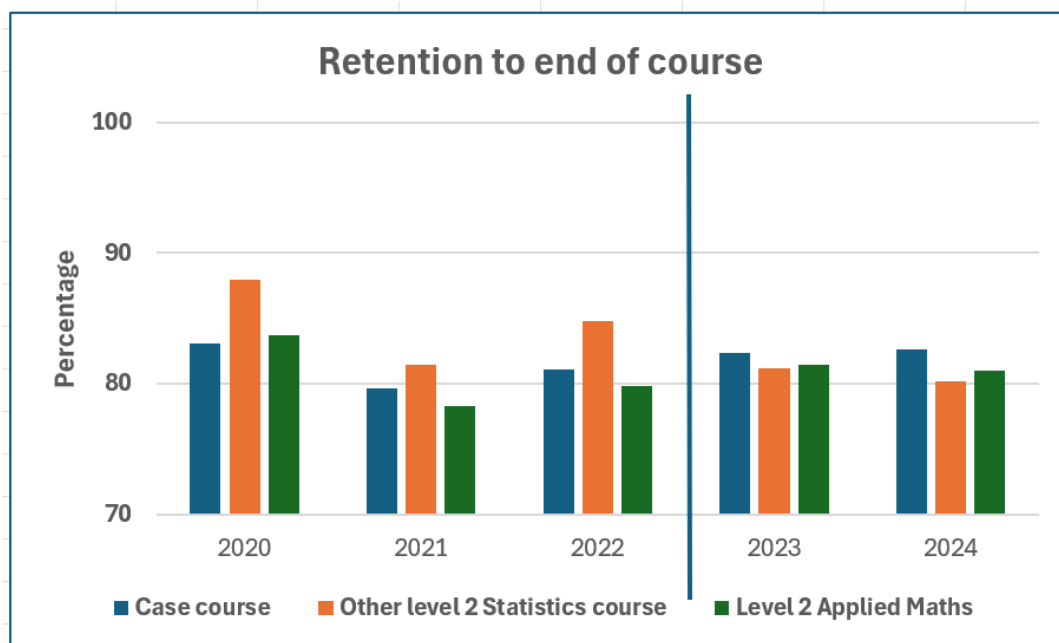


Figure 3: Percentage of students retained on Level 2 courses.

3.3 Students' concerns

Initially, as with the acknowledgement of use of GenAI, students were reluctant to answer an anonymous questionnaire or offer their views. This apprehension has been decreasing and this is apparent when looking at results from the multinational survey. The students on this course were higher users of GenAI (Figure 1) than those on the other two courses and as Table 2 shows, they expressed less anxiety about the impact on their learning. Across all the students, though, uncertainty about permissible boundaries was evident, with most students worried that GenAI use could lead to accusations of academic misconduct.

Table 2: Percentage of students who agree/ strongly agree that they are concerned about aspects of using GenAI.

Percentage who agree/strongly agree	This course (n=74)	Level 3 economics (n=47)	Level 1 mathematics (n=79)
Using GenAI for assessments undermines the value of a university education	41%	43%	37%
I am concerned that GenAI might limit my ability to learn my subjects.	41%	55%	44%
I am anxious about using GenAI for fear of being accused of academic misconduct.	50%	68%	65%

3.4 Associate Lecturers' views

ALs were initially very concerned that any potential use of GenAI was open to abuse, they considered that its use should be banned, and training should be provided to detect its use. An early study (Hardie et al., 2024) established that, in mathematics, training actually resulted in an increase in false positive rates and hence was counterproductive. This helped us adopt a position that, as GenAI use was not detectable and as assignments were formative, we should proactively explore the positive advantages of GenAI.

ALs, whilst largely committed to promoting a position where students use GenAI as a learning aid, remain concerned about the wider associated issues. All thirty ALs on this course took part in a survey in March 2025 and 40% then took part in a similar survey across all ALs in the school in August.

Table 3: Percentage of ALs expressing concerns about student use of GenAI: August 2025.

Percentage very concerned that	ALs on this case study (n=29)	Other ALs in school (n=87)

Using GenAI for formative assessments undermines the value of a university education	17%	44%
Using GenAI for summative assessments undermines the value of a university education	38%	79%
Will limit student ability to understand materials	34%	47%

4. Discussion and Conclusions

The emergence of GenAI has been at a pace far exceeding that of previous technological shifts. HE institutions are responding but students have generally adapted far more quickly than their universities. For the institution, the central team, the ALs, and the students, this period has required considerable adjustment, and early reactions to GenAI were not universally positive.

Gaining an understanding of AL and student perspectives—through surveys, forum interactions, and online synchronous discussions—has been essential in developing a shared sense of direction. The principle of supporting students to make informed, autonomous decisions about their learning aligns well with the University's broader approach. Like ALs, many students initially expressed concerns about how GenAI might affect their learning or the perceived credibility of a university qualification. Acknowledging these concerns allowed us to shift away from warnings and restrictions, and towards encouraging students to critically assess whether GenAI could offer benefits for their own learning.

The introduction of a straightforward proforma for students to acknowledge their use of GenAI in assignments provided valuable insight into differing patterns of engagement. In broad terms, GenAI usage was higher by students without strong backgrounds in mathematics or statistics. Students studying subjects such as economics, combined STEM, or the Open degree—groups that historically often encountered challenges with mathematical content—appeared to gain confidence from using GenAI as a learning aid or “study buddy”. These observed differences in use reinforced the view that many students will make their own informed choices about how and when to engage with GenAI.

Notably, our retention rates increased over the case study period, particularly when compared with other mathematics and statistics modules. While assessment and examination scores did not show significant changes, the slight reduction in withdrawals suggests that some students who might previously have disengaged now felt able to continue. This supports a longstanding but previously anecdotal impression that a few students were leaving, not due to inability, but due to declining confidence in managing the course demands. GenAI may have helped reduce this loss of confidence for some learners.

Students on this course report a higher usage of GenAI and an increase in confidence due to their use of GenAI. ALs are more positively inclined towards GenAI than their peers are now willing to engage with students around the appropriate use of GenAI. A small minority—approximately 10%—continue to feel that supporting students in the effective use of GenAI does not fall within their remit.

Sustained communication and a flexible, collaborative approach have been central to bringing ALs and students to a broadly shared position. However, the changing nature of GenAI, its evolving accepted areas of use across HE and within employment, mean we will have further still to travel.

5. Future work

In 2026, we will launch a student-led project, recruiting two students to design and produce resources that demonstrate how GenAI can be used as a study-support tool in mathematics and statistics. The central team will continue to produce resources and additional student communications, designed by their peers, will further help students to make their own informed choices about use of GenAI.

Currently all course assignments are formative followed by an examination. In 2027, the final assignment is planned to become summative. GenAI would be allowed in that summative assignment but would still not be allowed in the final examination.

In 2023-24 the central team shared GenAI produced assignment solutions with ALs, to help them judge whether a student's work might rely on unacknowledged GenAI. In 2025-26 this approach has been recommended by the department's Academic Integrity lead, to increase consistency in Academic Conduct referrals. Additionally the guidance provided for this course, with modification, will be incorporated into wider guidance for the school as more courses allow the use of GenAI.

6. Ethics statement

The student surveys had full Student Research Project Panel and ethics approvals. The tutor survey had Staff Survey Project Panel approval.

7. Acknowledgments and disclosure

To the School of Mathematics and Statistics for enabling the course to be a pilot in 2023-24 and hence trial the use of GenAI with students.

To eSTEE M (internal) for funding of continuing work in 2025-2026.

GenAI (CoPilot) has been used to improve clarity of expression in preparation of this paper.

8. Appendix One

M248 25J: TMA proforma for generative AI use

Please use this proforma at the beginning of your TMA to indicate how/if you have used generative AI.

I have used Generative AI in this TMA (such as Copilot, Gemini or ChatGPT) to help with the following:

[please tick all that apply]

☐ As a starting point or inspiration with a part of the TMA
e.g. to understand wording in the TMA.

☐ To improve my own work
e.g. with style and phrasing.

☐ As a learning aid when studying the materials for this TMA
e.g. when working through examples.

☐ I did not use generative AI to help me with my TMA answers

9. Appendix Two: Feedback to students and ALs

Feedback for 2024-25 cohort placed on student forum re use of Gen Ai

Hi all

Many thanks for the proformas that you include with your TMAs. Please continue to do so for TMA05, TMA05 and TMA06.

At many Universities you would have the opportunity to directly discuss with other students how, if at all, you were using Gen AI as an study aid. We have a forum on "Tips and tricks: Using Gen AI on M248" which is for to post anything you want. But the module team and tutors wanted to let you know that

-around 90% of you are now including the proforma automatically with your TMA. Thank you. Please continue to do so and your tutor might continue to remind you before TMAs are due

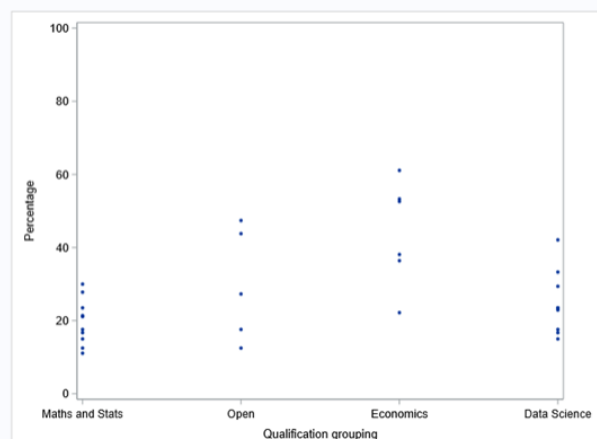
*- around 30% of you are using Gen AI in **some** way and this varies by qualification group. The lowest percentage of usage is amongst the Maths and Stats students at 19% and the highest at 44% amongst the Economics students, 39% of data science students and 28% of those of you on Open degree/Stem Open/other and or no stated qualification, say in the proformas you have used Gen AI*

- 15% of you have said you used GenAI as a starting point /inspiration for the TMA and just slightly more at 18% said you used it to improve your own work.

Feedback for 2025-26 cohort placed on student forum re use of GenAI

After first assignment

Percentage of proformas recording use of GenAi as a learning aid by tutor group



You might be interested in some feedback on how your peers, as a group of M248 students, are using GenAi .

On M248 you do not **need** to use GenAI but can if you want. It can potentially both help you understand the materials and get started/ improve your TMAs. You cannot use GenAi in the M248 exam and you cannot use GenAi in TMAs or the exams on most other Maths&Statistics modules.

This chart has one dot for each tutor group of which there are just over 30. The tutor groups are arranged into the four broad categories that we also use for tutorials. The groups are of students taking qualifications in Data Science; :Economics ; Maths/Statistics and Open/combinedSTEM/ other/ no qualifications. The chart shows Economics students tend to use GenAi as a learning aid more than Maths and Stats students.

10. Appendix three: Examples from the 12 pages of guidance to the cohort 2025-2026 cohort of students on M248.

How might Generative AI be helpful to me on M248?

September 2025

We want to help and encourage you to use Generative AI (GenAI) responsibly as an aid to your studies on M248.

- GenAI, like Co-pilot, ChatGPT and Gemini, can be a great tool to help you study and complete your M248 assignments.
- Use GenAI alongside asking your tutor for help.
- You can use GenAI to improve your writing when you are placing your answers back in context, or explain ideas you might be struggling to understand, or perhaps to generate examples where you feel a little more practice would help you grasp an idea. It can help you check your work and to make revision more productive.

BUT

- You need to use it responsibly and within the University guidelines at [GenAI for students](#)
- You are responsible for your work, and you need to check anything that GenAI suggests. It is true it gets things wrong sometimes so you need to critically check. Critical thinking is one of the highly rated skills of University graduates.
- Don't be overly reliant on using GenAI.

BECAUSE

- You cannot use GenAI in the final M248 exam.

1 How do I access GenAI?

There are lots of free GenAI tools available. In this guidance document, we show examples that use Copilot or ChatGPT.

ChatGPT is free. Search for “ChatGPT” and register.

Copilot comes with Microsoft 365 to which you have free access as a student. On studenthome look under the heading LINKS on the right hand side to get a free Microsoft 365 account. If you use the Microsoft Edge browser, and are logged in to your student account, you will see the Copilot icon at the top of your student home page - click on it



and Copilot opens.

Another GenAI tool that you may come across is Gemini. Gemini output often appears at the top of a Google search results page.

2 When can I use GenAI in my M248 studies?

The University policy for [GenAI for students](#) explains the different categories of GenAI use in assessment.

The M248 TMAs are Category 2 - this means you may use GenAI to help you complete the TMAs.

The M248 exam is Category 1 - this means the use of GenAI is not allowed in the exam.

4 Do I have to use GenAI?

No! You don't need to use GenAI. All the knowledge you need for M248 is contained within the module materials. There are examples and exercises throughout the module books, practice quizzes available on the module website, as well as screencasts (videos) and a full tutorial timetable.

However, GenAI does present opportunities to enhance your study and learning:

- If you're struggling with a particular topic, GenAI could help you master it.
- If you want to explore outside of the module materials, GenAI can help with this.
- It can help you to develop skills in critically evaluating the output (this is a very important skill for study - and employability).

5 Using GenAI for study support

GenAI can act as a study buddy. It can write for any type of audience you want - for example, as bullet points, or technically, or chatty and friendly. You can keep asking to explain something until you are happy you have got the idea, and you can ask it to generate examples if you want more practice on a topic that you are finding tricky. For example, you can ask it to take on the role of an undergraduate science student and ask it to help you explain a concept. One of the roles it can take on is the Socratic method which is explained in section 5.2.

6 A final note about using the module materials vs GenAI

GenAI tools, like Co-pilot, ChatGPT and Gemini, present an opportunity to explore the world of statistics, and it can be a great tool to help you learn and study statistics. On M248, you **may** use it to help you prepare your TMAs.

However, please note that all the knowledge and skills that you need to complete M248 successfully are contained within the the M248 module materials. You have the textbooks, the handbook (containing useful summaries of each unit, probability tables and other summarised information from the course), and the module website which has practice quizzes, screencasts, and the forums. There is also a comprehensive timetable of regular tutorials covering all topics.

Remember that your TMAs on this module are assessing what you know about the statistical techniques covered within the module materials. Always refer to the module materials to check GenAI output. If you aren't sure, you can also ask your tutor or post on the module forums.

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