Teaching Research Methods in a Changing World: Responding to Generative Artificial Intelligence

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Abstract: While the tools associated with Generative Artificial Intelligence have evolved over some years, they have become widely used and entered widespread public consciousness since 2022. Generative AI has an immediate impact on Higher Education because of its effect on many of the skills that students need to acquire. Immediate responses to the availability of Generative AI have focused on concerns about student cheating and about the need to design its inappropriate use out of assessments. While the discussion of how it affects learning and teaching has moved on to recognise that students do need to understand how Generative AI can be used there is still limited appreciation of where it fits into the teaching of research methods. Generative AI, used carefully and appropriately, can be applied as a research tool and as it evolves it is likely that new opportunities for its use will emerge. Research typically entails a measure of independent work and scholarly writing by students. Generative AI can create wording which, at least superficially, can appear to a reader as professional and fluent but which is often generic and superficial. For a student encountering the need to carry out research for the first time, typically as part of a taught degree course, it can be difficult to distinguish between the legitimate use of Generative AI, for example to assist with creating ideas, and its inappropriate use to produce text which does not reflect research which has been carried out. A useful starting point for discussing the application of Generative AI is to compare it with the involvement of another person. For a student to pretend that something is their own work when it is not, constitutes plagiarism whether the work in fact is produced by somebody else or it is produced by an AI engine. Conversely it would be reasonable to discuss concepts with another person and similarly to discuss them with AI. Framing this introduces some challenges around how to build AI into teaching about research.

Keywords: Generative AI, Teaching, Research Techniques, Adapting to Change

1. Introduction

Generative Artificial Intelligence (GenAI) has created a considerable amount of interest in recent years, and there are multiple perspectives on it ranging from it being presented as a cause for deskilling across many different roles to it being seen as a fad which could be forgotten within a few years. Among all these it is possible to take a pragmatic perspective that this is something which can enable significant social and economic change, and will have a distinct impact on both research and teaching within universities, without expecting fundamental and even apocalyptic outcomes.

Covering research methods within a taught university course introduces some particular challenges because a number of factors are relevant. GenAI has an immediate impact on the teaching of many different subjects, since it introduces new concerns about plagiarism and also makes it more difficult to encourage students to develop independent writing skills. This is especially relevant to teaching research methods given that it is not easily assessed through invigilated closed-book exams and that writing-up is an integral part of the research process.

When students learn research methods they are typically expected to practise research on at least a modest scale. Typically they are encouraged to choose research questions relevant to contemporary issues and in the current climate this means that the impact of GenAI across a range of sectors is a popular area.

Additionally GenAI has the potential to be a tool for research in the future and students need to have an appreciation of this.

2. Methodology

This paper discusses and reflects on the interplay between these factors and what this means in practice for educators. The methodology is reflective and recognises the constraints associated with a rapidly changing subject. The paper is essentially conceptual including a review of relevant literature spanning both teaching and research, and then draws on the author's experience of adapting to the availability of GenAI across a range of sub-disciplines taught within a business school, and also of teaching research methods and of supervising individual students' research projects. It sets out to identify how this specific area of teaching should adapt to the availability and evolution of GenAI and to provide pointers to next steps.

3. Literature Review

Mollick (2024) introduces GenAI with an account of his own experience in late 2022 when ChatGPT had recently been introduced: he asked it to act as his negotiation tutor and was so entranced with the experience and the effectiveness of the tool that he worked through the night to become familiar with it. He therefore posits 'three sleepless nights' as the effort needed to get to know GenAI. His discussion of how GenAI is likely to impact many aspects of life ranges across creativity, collaboration, and education. He discusses the potential for AI as a tutor and coach and specifically acknowledges what he terms the 'homework apocalypse' caused by a flurry of GenAI-created essays, and the need for educators to consider how GenAI is to be used beyond this stage. While Mollick is bullish about the future potential and importance of GenAI he remains emphatic that this is a tool which complements human intelligence – hence the title of co-intelligence – and not a substitute for it. His work provides a useful framing of the possibilities offered by GenAI although his perspective, informed by his own discovery of the technology, is not necessarily shared by his readers.

GenAI has already had a profound effect on university education. It provides tools and ready access to resources which previously would have needed very significant effort on students' part. There are parallels with the advent of widespread online materials around the turn of the current century, which meant that a lot of information, much of it specialist, became very easily available, and which opened new possibilities but also placed fresh obligations on students to cultivate abilities to interpret and navigate that data. However GenAI has been specifically positioned as something capable of writing essays with minimal intervention from a student (Sharples, 2022). So in contrast to access to the Internet, which has given students the ability to process and build on richer datasets than those available to previous generations, GenAI has the potential to 'deskill' one of the key components of university learning. When surveyed a majority, but by no means all, students say that they use GenAI (Freeman, 2024) and generally had thoughtful and nuanced ideas as to what was and was not acceptable. Notably they were comfortable with using GenAI to discover and explain concepts, and indeed suggesting research ideas, but recognised that they should not submit text created by GenAI in assessments. This sort of analysis typifies much of the initial response to GenAI in educational settings with an emphasis on assessments and integrity: it also tacitly assumes that many students are instrumental and will seek to complete assessments with the minimum effort feasible.

Pratschke (2024) introduces the challenges around GenAI in education through a useful reprise of how AI has developed since the term was first adopted as early as the 1950s, a reminder that the potential for GenAI to have a considerable impact on education was predicted before the release of ChatGPT, and a note that different proponents of GenAI often have contrasting views on how best it should be applied. Her approach is valuable from the Higher Education perspective in moving the discussion beyond a focus on only parts of pedagogic activity such as assessment. She discusses the importance of creating a GenAI ecosystem for education in which humans' knowledge and skills complements what can be created using GenAI and argues for an institutional vision which, among other things, depends on staff and students having access to tools, a readiness to embrace rapid change, and considering assessment as an integral part of learning. Sallai et al (2024) take a similar perspective presented in blunter terms, arguing that active engagement with GenAI is key to avoiding a situation where it becomes a reason to reduce student learning.

UNESCO produces a useful introductory guide to GenAI in higher education (Sabzalieva and Valentini, 2023) which through being both comprehensive and accessible has considerable value as a basis for universities to determine how to adapt. Based on ChatGPT3.5 and acknowledging that the technology can be expected to improve rapidly beyond what was available to the guide's authors when written, it takes the reader through some background and some guidance around appropriate prompt engineering for the context. Furthermore it suggests a series of applications of GenAI in university teaching and learning:

- Possibility engine
- Socratic opponent
- Collaboration coach
- Guide on the side
- Personal tutor
- Co-designer
- Exploratorium
- Study buddy
- Motivator
- Dynamic assessor

Newell et al (2024) position GenAI as a 'beneficial disruptor' to higher education, recognising that it can have a profound impact on the way that teaching and learning takes place and, in common with much of the literature that has emerged around the use of this technology, advocating for educators to engage with it. Their approach is particularly valuable as it draws on classic innovation theories, notably diffusion of innovation (Rogers, 2003) and they suggest that most educators (as of 2024) are at a 'persuasion' stage and are still early in their decision-making processes. Miller (2024), taking the perspective of having responsibility for an academic library, and therefore an overview of students' information searching and navigation approaches, proposes a spectrum of red/yellow/green lights to indicate different levels of resistance to use of GenAI – red referring to the most creative and personal processes while green refers to processes which could be seen as laborious and repetitive. A point which is implicit in these perspectives is that this is still a very new technology and the approaches needed to incorporate it into higher education in the longer term may be very different from those needed for a rapid response to its availability. Like Sabzalieva and Valentini (2023) these offer frameworks with the potential to prompt further analysis.

In contrast to many other authors, de fine Licht (2024) makes the case for prohibiting the use of GenAI in certain circumstances, arguing that it is not feasible for either students or faculty members to gain the understanding of GenAI necessary to foster its constructive educational use within a university. He suggests that students are liable only to engage superficially with AI in learning and that they may be unaware of the privacy and data integrity issues associated with its use. He also brings in concerns about energy consumption, and exploitative practices among the creators of GenAI tools, though these are broader issues about the widespread use of these tools and it could be argued that forbidding students from using these tools at university means that they do not confront the issues. Nevertheless, he acknowledges that there are arguments in favour of GenAI being used and students being encouraged to engage with it, especially in a potentially changed landscape in future.

Pallai et al (2024) address the concern that students might adopt GenAI in a way that its becomes a substitute for learning. Their key recommendations include that educators should assume that students are using GenAI, that it is essential to recognise that GenAI is evolving and that the limitations of the current tools are likely not to apply in the fairly near future, and that teachers within universities need to have a good level of understanding of GenAI.

Crompton and Burke (2023) base their findings on a systematic review of literature on AI in higher education published from 2016-2022, so in general just before the advent of GenAI. Nevertheless their findings are instructive with a notable insight that the literature on AI in higher education focused on its use by students in contrast with the equivalent literature for earlier stages in education which focused on its use by teachers. They identify assessment as the most widespread use of AI but also presage the emergence of some GenAI applications notably by mentioning intelligent tutoring systems.

Unsurprisingly, the UNESCO report (Sabzalieva and Valentini, 2023) addresses the potential contribution of GenAI to research as well as to education. Its authors note that a complete research paper could in principle be written by GenAI and that the ethical implications of this remain unresolved. They identify within each of four stages where GenAI could be applied in research:

- Research design
- Data collection
- Data analysis
- Writing up

Notably in the data analysis stage they envisage potential for GenAI to code data and suggest themes, and in the writing up stage they mention including writing quality as well as translation and correct formatting of references and citations.

Burger et al (2023) build an optimistic picture of the use of GenAI in research, focusing on the data analysis stage. It is a useful counterweight to the temptation to see GenAI more broadly as a way of deskilling activities. Notably they posit that GenAI should be able to read source papers more comprehensively and accurately than a human. As scholars of entrepreneurship, and writing at a time when usable ChatGPT had recently become available, they identify the creation of new tools focused on research as an opportunity for new businesses. Among the instances of data analysis where they see possibilities is the creation of systematic literature reviews where the use of correct search terms is crucial and AI can analyse data rapidly and thoroughly. Ngwenyama and Rowe (2024) focus specifically on the literature review process and emphasise the need for researchers to be aware of the limitations of AI and to bring their own understanding and critical abilities to the process. Mollen (2025)

highlights the ethical issues arising from the use of GenAI and argues that approaches to research governance will need to evolve to address these.

4. Bringing GenAI Into Student Research Projects

The impact of Artificial Intelligence – not necessarily GenAI – has been a significant source of ideas for students' individual research projects since 2021. Among the first uses of any form of GPT by a student seeking guidance from the author, was one researching ethical investment. The student experimented with whether an earlier version of GPT (not one which could be considered as GenAI) could provide a more effective balance between financial yield and ethical considerations than a human. From a practical and ethical viewpoint this was little different to any other student project evaluating the use of a new technological tool and in terms of the uses identified for GenAI in research this would count as data analysis.

To provide some background the author teaches in a business school where both undergraduate and taught postgraduate students have some material on research methods built into their course. Typically students are expected to work in small, usually self-selected, teams to carry out a small-scale research project. As this entails a significant element of independent inquiry, the use of GenAI as a guide on the side or as a co-designer of research would be appropriate so long as the completed work reflects the students' own efforts.

Most of these students go on to do some sort of individual project as a capstone for their studies: in a school with multiple courses at each level and various pathways and options there is considerable variation in the way that individual projects run, and not all students do such a project. A principle underlying all of this is that an element of research skill is essential for any sort of business or management career.

A typical research methods module covers how to define a research question, what is needed for a literature review, fundamentals of qualitative and quantitative research, data collection, use of case studies, and coding. In recent years a significant element of using analytics has been added to these modules so students have some understanding of how to analyse very large sets of quantitative data. There is some discussion of research ethics. Team coursework within the module is covered by a general ethics approval for the whole cohort so long as they avoid certain risks. Individual projects do require ethics approval if the students are collecting primary data through interviews or surveys, and a lightweight process is available again so long as they avoid the same set of risks. For example a student proposing to survey people working in casual jobs in hospitality initially suggested including participants as young as 16 to encompass those at school and working during their holidays. By setting a minimum age of 18 the student was able to exclude a category classed as vulnerable and be eligible for the lightweight process.

GenAI initially became a factor in these projects as a topical area for students to study, as with the ethical investment example above. Creative domains such as fashion and the arts are consistently popular with a significant number of students. As part of the training to define research questions, students are encouraged to look for a distinctive perspective or problem affecting a domain which interests them. In an environment where GenAI was getting a lot of coverage in non-specialist outlets and was also promoted as something about which students should need to know, the impact of GenAI on a particular sector became a popular research topic.

Superficially, to a supervisor, the first wave of projects around GenAI seemed very similar to others involving technology adoption over the years. Typically a student would frame their enquiry around a model for change or innovation – diffusion of innovation (Rogers, 2003) being a popular example – use one or more of interviews, surveys, and background reading to learn more about where the technology was being used, and in some cases construct a case study based on what they had discovered. While it was always stressed in briefings that students were not expected to carry out truly original research at this stage, an attraction of using primary data and contemporary issues was that they would produce a distinctive and usually analytical piece of work.

Once these projects were underway it became apparent from supervision meetings that students were engaging more deeply with GenAI than simply writing about it. A few students even qualified the standard wording about the originality of their work, saying that they had sought assistance from ChatGPT or other comparable tools, such as Claude or Microsoft's Copilot (now integrated into the Office software that they used in writing their projects) and stressing that all the wording itself was their own. This formulation would be familiar to most supervisors: it is very similar to the sort of statement included along with an acknowledgement section to qualify thanks being given to peer students or to family members. In principle this is an eminently reasonable use of GenAI – in Sabzalieva and Valentini's (2023) terms it is being used as the guide on the side.

The table below summarises the connection between issues raised in the literature and issues around applying GenAI to teaching students how to research:

	Initial Response to GenAI	**Students Researching GenAI**	**Students Using GenAI in Their Research**
Concerns about whether use of GenAI should be permitted	Introduction of clear guidelines and policies for students	Identifying GenAI as an emergent area for research	Guidelines and restrictions on its use
Changes in types of assessment which are feasible and robust	Moving away from conventional essay-type assignments	Developing assignments which allow students to evaluate critically applications of GenAI	Including GenAI among the tools and methods available to students
Use of GenAI constructively as a study tool	Concern about hallucinations especially false references	Encouraging students to explore possibilities	Providing scaffolding for use in categories such as study buddy
Use of GenAI as an aid to research	Concern about its use for writing superficial and inaccurate accounts	Developing awareness of GenAI's potential and limitations	Use in data collection and analysis including in literature reviews

5. Further Discussion

Pratschke (2024) in discussing assessment observes that the important aspect of using an essay for assessment is the process of writing it: without the process there is no learning and this is one of the foundations of her call to integrate assessment ever closer with learning. In the research methods teaching discussed here there is a strand covering the extent to which a research project is distinct from an essay, and even a polished and well-referenced essay would be at best a weak effort if submitted in place of a piece of research.

So an in-depth and closely supervised student project would remain a useful assessment tool because of the intensity of the process and the element of continuous individual learning. Conversely a systematic literature review with limited scope, which historically might have been an appropriate choice for a students looking for a smaller project with an element of research, has become something which GenAI could produce. To make matters worse, a problem with weaker students and large-scale individual independent assignments is that they tend to put together work rapidly at the last minute rather than learning gradually, and relying on GenAI for most of this task would exacerbate that effect.

One response to the limitations of the conventional essay is to develop the concept of a reflective account based on a student's own experience. Creating a narrative account is a valuable research skill and it would be valuable to build instruction in how to do this explicitly into research methods training.

An element of research methods teaching is to explain how to build on existing work and add something which makes it distinctive and reflects the student's contribution. Many business and management students – even those taking post-experience masters degrees – struggle with this in practice and take time to internalise it. A potential approach to adapting to GenAI is to expand this part of the teaching and argue that the same factors that apply when building on work done by another person – paraphrasing, avoiding plagiarism, acknowledging their contribution, applies when building on work done by GenAI. Potentially GenAI could become a co-designer of the student's output so long as the student's intellectual contribution is made clear.

Moving on to discussion of the use of GenAI in research, there are already multiple indications that the range of research methods to which students should be introduced is changing as a result. The incorporation of analytics in research methods teaching is evidence that it is already possible to develop and enhance course content to accommodate new techniques. Within the coverage of quantitative research in particular students are encouraged to learn about analysis software for which enhanced versions are regularly released, and it is important that teaching material is adapted to encompass such updates. Prompt engineering is increasingly a valuable skill for students setting up research activities: building appropriate prompts should be part of research methods training although there is a danger that as universities move to build GenAI awareness into different parts of a course duplication could arise, for example with modules devoted to understanding AI and technological innovation as a whole.

Incorporating GenAI into defining a research question and choosing appropriate methodologies would be in line with Sabzalieva and Valentini's (2023) category of a possibility engine.

Given that the process of writing and researching a project is essential for learning, and usually involves a student working as an individual or small group with a supervisor, then it is essential that supervisors also gain a clear understanding of GenAI. Sabzalieva and Valentini's (2023) categories also offers scope for GenAI to assist some of the supervisor's role notably as a Socratic opponent and as a dynamic assessor. A theme is that GenAI potentially redefines what humans can do and what can be automated and therefore how humans and machines can work together.

6. Conclusion and Recommendations

GenAI is evolving rapidly and many of the current limitations on its utility are likely to disappear. Its effects reach many different aspects of higher education and the teaching of research methods is no exception. Based on the points above the following should be key considerations in teaching research methods:

- GenAI cannot be ignored: it is better to recognise its potential and provide guidance on its use than to prohibit its use by students entirely
- Students should not create work using GenAI and claim it as original: however there are many ways in which GenAI can contribute to their work and they should be encouraged to be honest and transparent about how they have used GenAI and what their original contribution has been
- Educators need a clear understanding of GenAI and need to keep their own knowledge up to date, as should be the case with any emerging technology used by students
- GenAI has the potential both to automate parts of research processes, such as compiling systematic literature reviews, and to enhance the human contribution to other parts, such as coding and data analysis. Assessment and students' individual research projects should be structured and defined in a way that reflects this
- Pedagogic uses of GenAI include providing guidance and managing Socratic dialogues, activities which fit well with what a tutor should do when supervising and providing guidance for research activities. Educators should explore possibilities for this
- While the availability of GenAI changes the way that humans interact with machines, it does not remove the potential for humans to provide distinctive thought and analysis and students should be encouraged to make their own intellectual contribution in this new environment

Here are some practical recommendations for educators leading research methods modules:

- Build consideration of GenAI tools into the teaching. Add them to the portfolio of methods available and discuss their benefits and limitations
- Consider where GenAI can be used effectively to summarise large volumes of data
- Emphasise where human intervention and supervision is key to effective and accurate use of GenAI
- Address the ethical issues around using GenAI for research

Practical recommendations when supervising student research projects:

- Engage in continuing dialogue with students about whether and how they are using GenAI
- Foster critical discussion of material produced with the assistance of GenAI
- Encourage research projects which depend on students' intellectual contributions and cannot be carried out purely using GenAI

Ethical Declaration

No ethical approval is needed for this paper.

AI Declaration

No AI was used to write the paper.

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