Artificial Intelligence (AI) and Unit 1: Dissertation

In this support guide for students, we will present considerations students may take when exploring and critiquing the value of generative artificial intelligence (GAI) tools when creating a dissertation.

Context

GAI is revolutionising many industries, which include academic research and the creation of written articles. This work has historically been the sole preserve of humans with academic qualifications, lived experiences or formal and accredited training, but the recent widespread availability of text-based general purpose GAI tools presents a significant challenge to how we think about identifying research areas, and question the future ways in which we conduct research and analyse information, structure and create written work. It also questions how we draw conclusions and evaluate the impact of research where sources are less rigorously scrutinized or even worse, fictitious. The opportunities and implications of these GAI tools are still in their infancy despite the rapid adoption of generative AI (GAI) already in almost all sectors and industries, despite the potential benefits and drawbacks being largely unclear, undefined, and importantly untested.

AI:EPQ advice: The **sole use** of AI tools **cannot** meet assessment descriptor requirements set out for the extended project qualification. AI tool use can **appear alongside** and influence **evidence** for which the candidate has independently created (i.e. without the use of AI tools) in order to meet the assessment descriptors. Candidates are required to reference each and every instance of AI tool use within their coursework submission, and failure to do so will be considered malpractice.

Introduction

If you are considering carrying out an EPQ in Unit 1: Dissertation and are also interested in critically evaluating GAI tools in the context of your Dissertation assignment, here are some considerations you will need to take when carrying out your project.

1. Developing a working title for a Unit 1: Dissertation

The title for a Unit 1 Dissertation project should be written in the format of a question that is clear and specific, with room for argument or counter-argument.

E.g. "Should young teenagers be banned from social media?"

Whilst you are not permitted to use GAIs to carry out the research for you, in the above title, you could adapt the focus towards exploring the potential impact of GAIs that are already appearing in social media platforms, potentially without the awareness of the users.

E.g. "Does the subtle integration of GAI into social media platforms like Snapchat mean that there should be an age restriction preventing young teenagers from using them?"

In order to arrive at a suitable title for a dissertation, it is important to carry out an initial literature review, which allow you to identify if the topic or area of focus you using for your working title has sufficient existing literature (i.e. there are enough existing academic or published sources of information already), that the title you are interested in exploring has not already been addressed (i.e. an existing academic paper has tackled this exact topic before), but also to identify if there is not too much information available that might indicate your title is far too

broad, and should be narrowed in order to arrive at a justified but achievable conclusion within the time available for completing your EPQ.

Once you have arrived at a suitable working title with your teacher, and have carried out suitable exploration of existing sources, you are ready to begin. By using AI as the topic for your assignment, there will be instances where you will likely want to use a GAI to test what it is capable of doing, to inform your own judgements around what you are researching. It is important to review our guidance on recording AI use within your EPQ evidence, and also to read the issues to consider section of this document.

For more guidance on titles, see our titles support guide [here](#).

2. Documenting when and how you use GAI tools
If you are planning to integrate the critical analysis of any use or output from GAIs as part of your project, you will need to be explicit during the project write up, which includes a requirement to:
- retain a copy of the question(s) and computer generated content
- record a noneditable format (screenshot) of the question and output
- write a brief explanation of how the GAI has been used

These requirements can be recorded in a text document such as word, and referenced to in your project activity log.

Here are some key questions/milestones to consider when documenting your use of GAIs in your project activity log:
- Which GAI(s) are you going to critically review? (Ensure that you reference and evidence your use in a document)
- How are you ensuring that the prompts you use are sufficiently suitable to deliver appropriate outputs, that are less or not inherently biased? (You should aim to prepare for any GAI testing with a thorough and critical literature review that considers different perspectives or sides to a topic, debate or issue, before considering the validity of any prompt outputs)
- How did your use of the GAI(s) evolve during your project, and did change your perception of AI in relation to your title or topic? (Make sure to not only document your prompts, but also your evolving use of prompts, which can include "training" the GAI through a series of prompts over time)
- From your project experience of dissertation writing on the topic of AI, how will the pace of technological advancement in these GAIs impact your own and wider academic writing and research in the future? (e.g. will the role of academics, writers or researcher change in the future?)

GAI Tools

The following non exhaustive list of GAI tools are capable of generating outcomes associated with a Unit 1 Dissertation EPQ.

Text generation:

- ChatGPT
- Claude

Disclaimer. The AI tools and support provided by this document are designed to provide guidance to students interested in AI tools relating to EPQ. Some tools named may require payment or subscription to access full functionality. Pearson Edexcel does not endorse any individual tool, nor take responsibility for content generated from a tools use. Students are not permitted to use AI tools to generate evidence that they subsequently request credit for as their own, and are required to clearly declare any AI generated work within their assignment.

- Paperpal
- Google Bard

Research:

- PDFgear
- Consensus
- Scite
- Elicit
- Trinka

GAI tool issues to consider

The use of GAIs are intrinsically linked to potential issues that are a challenge for this evolving technology. Here are some specific Dissertation related issues that you may wish to consider within your EPQ.

Ethics

A significant issue associated with GAI tools and their ability to be used to generate work, is around ethics. Ethical use of tools, particularly to replicate or replace a human, have wide ranging associated and unanticipated issues, that may be of interest to you in your EPQ, specifically relating to the impact it could have on societal constructs (such as morality, status, cultural norms and behaviours). For example GAI tools can also be used for nefarious purposes, for example, to create seemingly convincing but potentially insensitive and offensive academic papers on topics addressing race or religion.

GAIs have been proven to create fictious references to people and academic papers which do not exist, quotes from people that were never made, and provide answers in instances where there is not suitable scrutiny to the validity of the output. Part of the ethical use of AI is to both acknowledge and challenge these limitations, and remain vigilant and aware of how this technology works and evolves over time.

Copyright

The copyright and ownership of academic writing and research, including intellectual property, are already issues within academia. Many articles are hidden behind paywalls or require subscriptions in order to protect ownership, while others are open access. What a GAI has access to will likely skew its ability to arrive at meaningful answers due to the limitations of the dataset it draws from, and this is an important consideration around AI when writing a suitably balanced academic paper.

Empathy

GAI tools are capable of following text-based prompts. However, in following these prompts, a GAI tool is incapable of judging the potential impact of their output, in the same way that a human is capable. This human capability relates to an important social norm, empathy, which affords reflection, perspective and responsibility to an outcome before committing to it. For example, a GAI might be capable of recognising that it should not advise on how to break into a car if asked. However, if the prompt was worded such that a fictitious scenario were to be less concerning in language terms, such as a person who is locked out of a car where their dog is trapped and overheating, the AI is known to respond with the required information. It is important for the purposes of your research to remember that whilst the GAI can be trained to respond, what it creates may well not be a suitable output.

Another example is where a GAI is instructed to respond as a specific person, for example as an art critique or sports coach, which can change how the tool generates its answer, compared to being simply asked to critique art or provide a coaching plan. Equally, the process of prompting a GAI to answer a question in a certain way, e.g. tell me why trade with the EU is good, vs tell me why trade with the EU is bad, will generate different answers, without account for whether either takes a balanced perspective. There are a wide range of sources to aid better prompt writing available online, which change as AI tools evolve.

Confidence scoring

How can users of AI know the reliability of the outputs they receive from AI tools, if the tool is not aware of what it has or has not been trained on? One answer to this is an indicator known as a confidence score.

A confidence score in the context of GAI responses refers to a numerical value or probability assigned to the system's level of certainty or belief in the correctness of a given response. It can help AI users and developers to gauge the reliability of the information provided by the GAI. When you interact with a GAI system, it generates responses based on its training data and algorithms. These responses may vary in accuracy, and a confidence score provides an indication of how certain the GAI is about a particular answer. A higher confidence score suggests greater certainty, while a lower score indicates more ambiguity or doubt.

For example, if you ask a GAI chatbot what is the capital of a country, which should equate to a confidence score of 100%, it may draw from a dataset that arrives at the right response but with a confidence score of 90% (i.e. some of its sources did not provide the right answer). This would suggest that the tool is confident in the accuracy of its answer. By comparison, a confidence score of 50% might suggest that the GAI is uncertain due to what it found in its dataset, because it found more contradictory information. Where a GAI tools dataset changes or evolves, it is important to realise that a confidence score could change over time. It is also worth asking the question, "why does this prompts' answer have such a high/low confidence score, and what is it about the prompt or topic that might lead to this".

Language/linguistics

Here are some key language and linguistics issues to consider around GAI use.

Lack of Contextual Understanding: A GAI may struggle to fully grasp the context, subtleties, and nuances of a given topic, leading to potential misinterpretations or inaccuracies in the generated content.

Inability to Interpret Uncommon or Specialised Terminology: GAI tools may struggle with domain-specific or highly specialised terminology that is not prevalent in their training data. This can result in inaccuracies or awkward usage in academic writing.

Difficulty in Grasping Abstract Concepts: A GAI tool may face challenges in understanding and accurately representing abstract or complex theoretical concepts commonly found in dissertations.

Limited Creativity / Originality: GAIs tend to rely on patterns and information from its training data, potentially limiting its ability to provide insights, which are often crucial in academia papers.

Risk of Biased Output: If the training data contains biases -or biases by exclusion - the GAI tool may inadvertently produce biased or skewed content, limiting impartiality and objectivity.

Challenges in Logical Reasoning: While GAI can generate coherent sentences, it may struggle with logical reasoning, potentially leading to flawed arguments or conclusions.

Difficulty in Handling Ambiguity: Ambiguity is inherent in language, and GAI may struggle to handle ambiguous phrases or statements, leading to potential misinterpretations.

Insufficient Handling of Unstructured Data: Dissertations often involve analysing unstructured data or qualitative research, which may be challenging for GAI models primarily trained on structured data.

Data limitations - the GAI output is limited by training data parameters, for example, it may only have data up to 2020 so has missed recent innovations and developments in the associated fields.

An interesting research piece in this field for you to consider:

https://www.sciencedirect.com/science/article/pii/S0169023X23000423

Trustworthy journalism through GAI discusses how recent advances in Artificial Intelligence (GAI), and in Machine Learning (ML) can be harnessed to support efficient production of high-quality journalism. The key issue it identifies is that of "trust".

Referencing
As a requirement for your EPQ assignment, you must create a bibliography of the research and academic sources of information you read, that support any written or performed output. As covered earlier, due to the advancing nature of GAI, you are also required to create evidence of AI use with the following details:
- retain a copy of the question(s) and computer-generated content
- record a noneditable format (screenshot) of the question and output
- write a brief explanation of how the GAI has been used

Web Link (URL):
Title: Andreas L Opdahl, Bjørnar Tessem et al – Trustworthy journalism through GAI
URL: https://www.sciencedirect.com/science/article/pii/S0169023X23000423
Date of access: 18th October 2023

Here is another suitable reference for the Trustworthy journalism through GAI paper
Author: Andreas L Opdahl, Bjørnar Tessem et al
Year: 2023
Title: Trustworthy journalism through GAI
URL: https://doi.org/10.1016/j.datak.2023.102182
Date of access: 18th October 2023

JCQ Guidance on Coursework Assessment
Please review the rules and guidance relating to the use of AI within coursework and assessments here:
AI Use in Assessments: Protecting the Integrity of Qualifications
Information for candidates Coursework assessments

Disclaimer. The AI tools and support provided by this document are designed to provide guidance to students interested in AI tools relating to EPQ. Some tools named may require payment or subscription to access full functionality. Pearson Edexcel does not endorse any individual tool, nor take responsibility for content generated from a tools use. Students are not permitted to use AI tools to generate evidence that they subsequently request credit for as their own, and are required to clearly declare any AI generated work within their assignment.