

Generative AI in Higher Education: Graduate Teaching Assistants' Practice and Reflection on ChatGPT for Module Assessment

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SUMMARY

The rapid evolution of Artificial Intelligence (AI) and the launch of ChatGPT and other Generative AI tools have concerned Higher Education Institutions (HEIs), which now need to develop comprehensive pedagogical guidelines and frameworks in this emerging AI era. These advancements have sparked discussions and research on their implications on assessment design and student assessment, with multiple opposing perspectives emerging. Whilst ChatGPT is perceived as an important opportunity for enhancing student learning, it is considered as a significant threat to academic integrity and student skills development. These differing perspectives create the need for teaching staff to reflect on their pedagogical practices on ChatGPT and Generative AI and propose potential paths forward for HEIs. Although research on Generative AI and assessment design is rapidly growing, the perspective of Graduate Teaching Assistants (GTAs) as teaching staff uniquely positioned to bridge the gap between faculty and students, is under-represented. To this end, in this practice paper, GTAs reflect on their dual identities as student and tutor to evaluate differing positions to the role of ChatGPT to support or hinder assessment. By being involved in a ChatGPT project for student assessment for MSc students in Engineering degrees, the authors present their reflections on the impact that ChatGPT and Generative AI technologies may have on HEIs, with a focus on assessment design, as well as on potential paths forward for the sector. This practice paper contributes to the ongoing discussions and research on the development of pedagogical guidelines and frameworks in the Generative AI era.

INTRODUCTION

Artificial intelligence (AI) has garnered attention in higher education since the 1970s, with researchers exploring the emergence of different AI tools in pedagogical practices, including assessment design and student assessment (Rudolph et al. 2023a). The emergence of Generative AI technologies, including ChatGPT, a chatbot which can generate responses on various topics engaging in human-like conversations with users, as a Generative AI and Large Language Model (LLM) technology (Dwivedi et al. 2023), has alarmed Higher Education Institutions (HEIs), requiring them to adapt to this constantly developing AI technology. HEIs need to decide whether to reject or embrace its usage by teaching staff and students, with assessment design and student assessment being a key area of consideration. Assessment design refers to the planning of the assessment while student assessment highlights the actual execution of these designs from the perspective of students' experience during the assessment (Fuentelba, 2011). This differentiation serves as the foundation for comprehending the potential impact of ChatGPT not only on the students' using behaviour during the assessment but also on the assessment design practices that educators need to react to the technology advances.

Multiple differing perspectives have emerged, and no universal consensus has been reached on whether ChatGPT and Generative AI is a threat or opportunity to student development. On the one hand, ChatGPT is viewed as a threat, as it may allow students to complete their assessments with minimal effort. For instance, students can outsource their essay writing to ChatGPT, raising academic misconduct concerns (Perkins, 2023), and negatively impacting learning and skills' development (Rudolph et al. 2023a). On the other hand, ChatGPT and Generative AI technologies are seen as an opportunity for enhancing student teaching and learning (Dwivedi et al. 2023). For example, its usage may promote students' self-regulated learning as well as provide them with constructive feedback on their work, with HEIs needing to teach students on how to use it ethically and critically, and assessment designs structured accordingly (Rudolph et al. 2023a).

It is imperative for teaching staff to reflect on their practices and discuss potential future pathways that can be followed so HEIs develop robust AI policies in their pedagogical frameworks (Chan, 2023). Despite the rapidly growing discussions on this topic, the perspectives of Graduate Teaching Assistants (GTAs) are currently missing. GTAs, as doctoral students with a fresh perspective on pedagogical practices and educational technologies, and by often being in close proximity to students, which allows them to develop approachable and relatable learning environments breaking down communication barriers, can provide valuable perspectives to this discussion. To this end, this practice paper provides the reflections of three GTAs on Generative AI after being involved in a project exploring the potential impact of ChatGPT on assessment design and student assessment on Engineering MSc modules. Reflecting on practice, the authors will offer their

viewpoints in consultation with literature, on key areas around assessment design and student assessment, including how the potential usage of ChatGPT, and other Generative AI tools in general, may be considered when designing module assessment in engineering education.

LITERATURE REVIEW

Despite ChatGPT's robust capabilities, its performance may vary in different disciplines, as found by Lo (2023), which may impact assessment design decisions in the Generative AI era. Whilst Lo (2023) recognises the importance of ChatGPT in enhancing student learning and development, they have pointed out several limitations that need to be accounted for, including low reliability and biased information. Considering the differing perspectives around the technology's limitations and capabilities, Rudolph et al. (2023b) provide various recommendations to HEIs for assessment design and student assessment as to how ChatGPT may be onboarded for student learning or how to educate students for its ethical usage, among others. Multiple perspectives are presented by Dwivedi et al. (2023) with some of them discussing the emergence of ChatGPT as a new opportunity for educators to further develop their pedagogical practices and better improve student learning and skills development, while others point towards the potential risks and concerns of ChatGPT in higher education. Firat (2023) explored the perceptions of various scholars and PhD students on the potential impact of ChatGPT in education, while Chan (2023) adopted a wider perspective on the impact of AI technologies in HEIs towards developing a comprehensive AI policy education framework. While research and practices around Generative AI technologies on assessment design and student assessment are rapidly growing, with differing opinions emerging, perspectives from the standpoint of GTAs are under-represented. By serving multiple roles simultaneously, including teachers, researchers, students, and employees (Muzaka, 2009), GTAs' viewpoints and perceptions can offer valuable insights towards the development of pedagogical guidelines and frameworks in the advent of the Generative AI era.

DESCRIPTION OF PRACTICE

Interest on ChatGPT

Since the release of ChatGPT, higher education institutions, including engineering departments, have been exploring its capabilities in regard to student assessments and outcomes. At the University of Warwick, several initiatives have been launched to better

understand this tool (e.g. University of Warwick, 2023). This paper aims to explore the outcome of one such initiative within the Warwick Manufacturing Group (WMG), a department within the University of Warwick, based on the reflective accounts of three GTAs.

ChatGPT Project

The authors were approached in their capacity as GTAs to input assignment briefs for 10 different Engineering MSc modules into ChatGPT. The assignments were essay based, with students tasked to complete those independently. The main aims of this initiative were to identify signs of potential usage of ChatGPT by students for assignment completion and to explore the capabilities of this AI tool into developing written essays.

Prompts in the form of queries or statements were created by the authors and inputted into ChatGPT with a goal of creating an output that mimicked a written answer to an assignment question. Multiple methods were employed to create prompts, including inputting the whole assignment brief into ChatGPT, then following with multiple, specific prompts in the form of clarifying questions and/or guidelines in order to extract more detailed information, or dividing the key requirements of the assignments into different individual questions in order to retrieve modular responses in an essay format. This allowed to explore the technology's capabilities through the usage of multiple different methods.

ChatGPT's outputs were stored in a Word document. The authors were then asked to draw observations on ChatGPT's outputs, such as signs of potential usage and its capabilities on completing student assessments and outcomes based on this practice.

DISCUSSION

As described, among the main aims of this project was to identify where and how MSc students could, in theory, use ChatGPT to complete their essays. With the GTAs having experience in marking MSc level essays, some important signs were identified. For instance, lack of referencing in long texts, or inaccurate references, is a key sign pointing towards the usage of ChatGPT, reflecting its inability to provide credible references. Additionally, lack of critical thinking can also be considered as a sign. The multiple prompts used during the usage of the tool led to this conclusion, as ChatGPT can produce strong descriptive

paragraphs, with critical thinking elements missing, which is a key requirement for MSc level assignments.

Through this project, it was realised that asking a marking team to manually detect AI generated content may be an inefficient strategy, as it seemed impossible to be able to distinguish with certainty that a paragraph or an essay has been developed by AI. Although some studies propose teacher's training as a potential strategy (Lo, 2023), manual identification may still be highly ineffective with low accuracy levels, leading to false student accusations. The emergence of AI detectors is often seen as a potential promising alternative; however, there is a risk of false positives and false negatives (Dwivedi et al. 2023). These technological limitations could lead to students facing inaccurate charges of academic misconduct significantly damaging student experience. These considerations led to the authors' reflections.

Graduate Teaching Assistant's Reflections

Reflections of GTA 1 – PhD in Logistics and Supply Chain Management

Through this project and my interactions with students as part of my GTA role, I have started to question whether it is an effective practice for HEIs to significantly rely on developing methods and strategies towards identifying AI generated content. While AI detectors may advance and achieve high accuracy levels, there is the potential that students will strategically, and constructively, use Generative AI technologies in ways undetectable by both humans and detectors. They might employ these tools for initial idea generation or draft assignments which they would subsequently develop through their own research, writing, and critical thinking skills. In such cases, students will have internalised this process and will have used Generative AI as a constructive tool to assignment completion in ways that AI detectors may not be able to detect. A potential path forward could be for these tools to be openly embraced and used as a companion for students' academic journey, supporting learning and skills development, with HEIs encouraging their constructive and ethical usage. Marking rubrics may be adjusted accordingly, while the ethical and efficient usage of Generative AI may be considered a valuable hard skill in the future workplace, which HEIs can help students develop and master. There seems to be a dual responsibility here, where, on the one hand, HEIs develop robust AI pedagogical frameworks enhancing student knowledge and skills development, and, on the other hand, students use these tools ethically and constructively while adhering to the academic integrity guidelines of their institution.

Reflections of GTA 2 – PhD in Engineering Education

While acknowledging the prevalent caution among higher education institutions, particularly concerning skills development and academic integrity in student assessments, it is crucial to recognize the inherent scepticism accompanying any new technology. As technology advances, our perspective and teaching pedagogy will also evolve over time. GTAs uniquely involved in this landscape, embodying a student-centric approach that emphasizes neutrality, openness to innovation, sensitivity to change, and a swift response to technological changes. This amalgamation of empathy towards students, openness to technological advancements, and prudence in teaching, positions GTAs as influential collaborators with teaching staff in developing guidelines, updating assessment designs and guiding students towards responsible utilization of Generative AI for learning. It can be worth in the following teaching sessions related to Academic Integrity or assignment briefs to conduct informal surveys with students regarding the patterns and trends of Generative AI using behaviour to foster open communication and create a shared understanding. Students are also encouraged to reflect on their role in academic integrity and responsible use of technology within the learning environment. Simultaneously, we advocate for adaptable assessment strategies, including diversified formats and fortified formative assessments, to enhance the overall student assessment experience and mitigate the risk of inappropriate ChatGPT use.

Reflections of GTA 3 – PhD in Educational Evaluation

Being involved in a task such as this made me realise that there are new avenues for module leaders to evaluate and scrutinise their own assessments. The possibility of adjusting assessments to counteract AI advancements should be the norm from now on. Academic integrity tends to be a reactive process post assessment but perhaps there needs to be a shift in mindset to be proactive as now the assessment itself may not be 'fair' within a cohort. 'Fair' is subjective though as should we expect students to be able to use AI tools or is that beyond the scope of their curriculum? Whichever direction we move into the next couple of years, AI tools will become more and more prominent, and it is up to the whole higher education community to figure a way forward.

Limitations

It is important to mention the two main limitations of this practice paper, prior the conclusions. Firstly, the number of module assignment samples explored was limited to 10, with the potential that a higher number of samples could lead to additional reflections. Secondly, the presented reflections are constrained to the current capabilities that these technologies have. With their rapid development, greater capabilities may soon be emerging, which may alter current reflections.

CONCLUSIONS

It is certain that the emergence and further development of ChatGPT and Generative AI technologies will bring revolutionary changes to HEIs, with assessment design and student assessment being significantly affected. Multiple paths forward can be adopted, and it is important for teaching staff to reflect on their pedagogical practices advancing current discussions. Whilst multiple, often opposing, viewpoints are presented in literature, perspectives from the standpoint of GTAs have been neglected, creating a gap which this paper aimed to address. With teaching staff advancing their knowledge and experience on Generative AI, future research should build on current pedagogical practices and reflections, in order to contribute towards the development of advanced pedagogical frameworks and policies in the advent of Generative AI in engineering education.

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