Ethical implications of Gen-AI and LLMs in computing education.

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Ethical Implications of Gen-AI and LLMs in Computing Education

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Abstract

The panel convenes five educators to discuss the ethical implications of utilising Generative AI (Gen-AI) and Large Language Models (LLMs) in computing education. Their expertise spans various domains, including organising national workshops on the implications of generative AI tools, conducting surveys on their use within curricula, implementing institutional policies related to technology use, and engaging with students directly in the classroom. They reflect on the evolution of Gen-AI and LLMs from challenging-to-use technologies to indispensable tools for users of all levels. Furthermore, they examine the ethical dilemmas arising from the widespread adoption of these technologies in educational contexts, particularly regarding issues of originality, integrity, and responsible use. In addition, they explore practical strategies for integrating ethics education into computing curriculum design and classroom practices. This includes discussions on the role of educators in guiding students towards ethical technology usage, addressing uncertainties surrounding Gen-AI tools, and fostering a culture of responsible innovation within educational institutions. Through their collective insights and experiences, the panel aims to provide recommendations for navigating the ethical complexities inherent in the integration of Gen-AI technologies into computing education curricula.

CCS Concepts

• **Social and professional topics** → **Computing education programs**; **Codes of ethics**; • **Applied computing** → **Education**.

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Keywords

generative ai, chatgpt, large language models, curriculum design, ethics, responsibility

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1 Summary

Generative AI (Gen-AI) and Large Language Models (LLMs) have been developed and are extensively utilised in numerous online applications. Various iterations and objectives are adjusted to meet user needs; for instance, Colab AI has been integrated to assist in debugging code mistakes. Outdated, imperceptible, challenging-to-use, and inaccurate technology is no longer relevant to describe Gen-AI tools. They have grown more knowledgeable and dependable for practically every user level, from professionals to small children. They are a part of the present global trend that millions of consumers are utilising. Deep learning algorithm advancements increase learning impact and boost the power of Gen-AI products and LLM models. Millions of data points have been used to train this technology, making it inevitable. As long as this technology is readily available, it cannot be turned off. Therefore, it should be investigated, documented, educated, and introduced to bring ethical policy and advice into compliance with contemporary standards to guarantee originality and integrity.

In this proposed panel, we plan to discuss the ethical use of LLMs and Gen-AI tools within the specific context of computing education, leveraging the panelists' diverse experience; including experience of running national workshops around this topic, gathering specific data through surveys, implementing policy within their institutions and/or being student-facing educators. Whilst educational institutions have begun to provide guidance to students amidst the growing popularity of Gen-AI tools, uncertainties remain. Furthermore, we recognise the need to embed the teaching of ethics within our curriculum, to better equip students with an

understanding of not only why, but also how they should be using Gen-AI. This panel will offer practical insights and strategies for integrating ethical considerations into curriculum design and classroom practices.

In conclusion, the proposed panel seeks to address the ethical implications of utilising Gen-AI technologies in education, providing a platform for dialogue and collaboration among educators, researchers, and policymakers. Through shared insights and collaborative efforts, we aspire to navigate the ethical complexities inherent in the integration of these cutting-edge technologies into educational settings.

2 Panel Structure

The panel will consist of a moderator, Mark Zarb, and four other panelists: John N.A. Brown, Martin Goodfellow, Konstantinos Liaskos, and Tiffany Young, all of whom have experienced the rapid shift into generative AI across various roles in academia, from instructor to policy maker.

The subsequent presenter bios provide insights into the expertise and perspectives that each panelist brings to the discussion, ensuring a rich and diverse exploration of this critical topic.

The itinerary will commence with the moderator introducing the panel and providing a brief background on recent concerns raised in the literature (6 minutes). After, all will give one case example of how they embedded ethics and generative AI within their classrooms and curricula (20 minutes, 5 minutes each). The differing position statements are briefly outlined with reference to the challenges, their perspective, and case example (5 minutes, 1 minute each). The panel then responds to questions from the audience (30 minutes). It is anticipated that questions will primarily be asked verbally by the in-person audience, but the panel is happy to accept questions fed to the moderator digitally through the use of a Padlet (or similar), which will be made available to conference attendees prior to the panel, and consulted during it.

2.1 John N.A. Brown

John N.A. Brown is a lecturer, research group leader, and pedagogic research champion for the School of Computing, Engineering and Technology at Robert Gordon University, and a Tandem Fellow of the Aarhus Institute of Advanced Studies. Previously, as a consulting researcher in Silicon Valley, he solved problems for Google, Facebook, LinkedIn, and Amazon. He is currently teaching undergraduate courses in Human-Computer Interaction and User-Centred Design, a graduate seminar in Quantitative Research Methods, and staff workshops on the pareidolia inherent in ChatGPT. Dr Brown is the founder of Anthropology-Based Computing and of a new international interdisciplinary challenge to help humanity to live better in a world that includes AI.

2.2 Martin Goodfellow

Dr Martin Goodfellow is a Senior Teaching Fellow in the Department of Computer and Information Sciences (CIS) at the University of Strathclyde. He is also the department's Director of Undergraduate Teaching and Deputy Lead of the Computer Science Education Research Group. His research interests include automated marking, blended learning and programming education, with his work being presented at conferences such as ITiCSE and CEP. Within programming education he is particularly interested in how the area will be affected by Gen AI and how we can adapt to handle this. He has given talks and ran workshops on these topics. He is also a Fellow of Advance HE and was a mentor for the Data Science and AI Educators' Programme at the Alan Turing Institute.

2.3 Kostas Liaskos

Dr Kostantinos Liaskos is a Teaching Fellow in the Department of Computer and Information Sciences (CIS) at the University of Strathclyde. He is a Fellow of Advance Higher Education. He is the Department's Deputy Postgraduate Director, and Director of the Department's MSc in Software Development conversion programme. He is also the lead of the Department's Computer Science Education Research Group, and has contributed to conferences such as Innovation and Technology in Computer Science Education (ITiCSE), Technical Symposium on Computer Science Education (SIGCSE TS), and Computing Education Practice (CEP). He is currently the Faculty of Science representative to the University's Working Group on Generative AI in Learning, Teaching and Assessment, and leads the sub-theme on developing mechanisms for gathering and sharing reviews of Gen-AI tools and services. He is currently leading an investigation of the impact of LLMs and the training requirements/needs of non-academic/non-expert staff in UK Universities.

2.4 Tiffany Young

Tiffany Young is a Lecturer within the School of Computing School of Computing, Engineering and Technology at Robert Gordon University (RGU), where she dedicates her efforts to advancing research in pedagogy and computing education. With a focus on integrating Generative AI (GenAI) into educational practices, she strives to harness its potential to enhance learning outcomes. Her work underscores a passion for innovation in teaching methodologies and the transformative impact of technology in education.

2.5 Mark Zarb

Dr Mark Zarb is an Associate Professor based within the School of Computing, Engineering and Technology at RGU, where he leads the Applied Computing Education (ACE) research group, with a research focus on computing education and pedagogy, particularly on student experience, grading schemas and, recently, the impact of generative AI. He has led three working groups at ITiCSE on a range of topics, from the concern of students transitioning into higher education, to the impact of the coronavirus pandemic on the subject area. Furthermore, Mark has a proven track record of leading workshops that convene stakeholders to delve into the profound implications of generative AI, fostering interdisciplinary discussions both within and across various institutions. He firmly believes that students should be taught to use AI tools ethically and responsibly where appropriate.