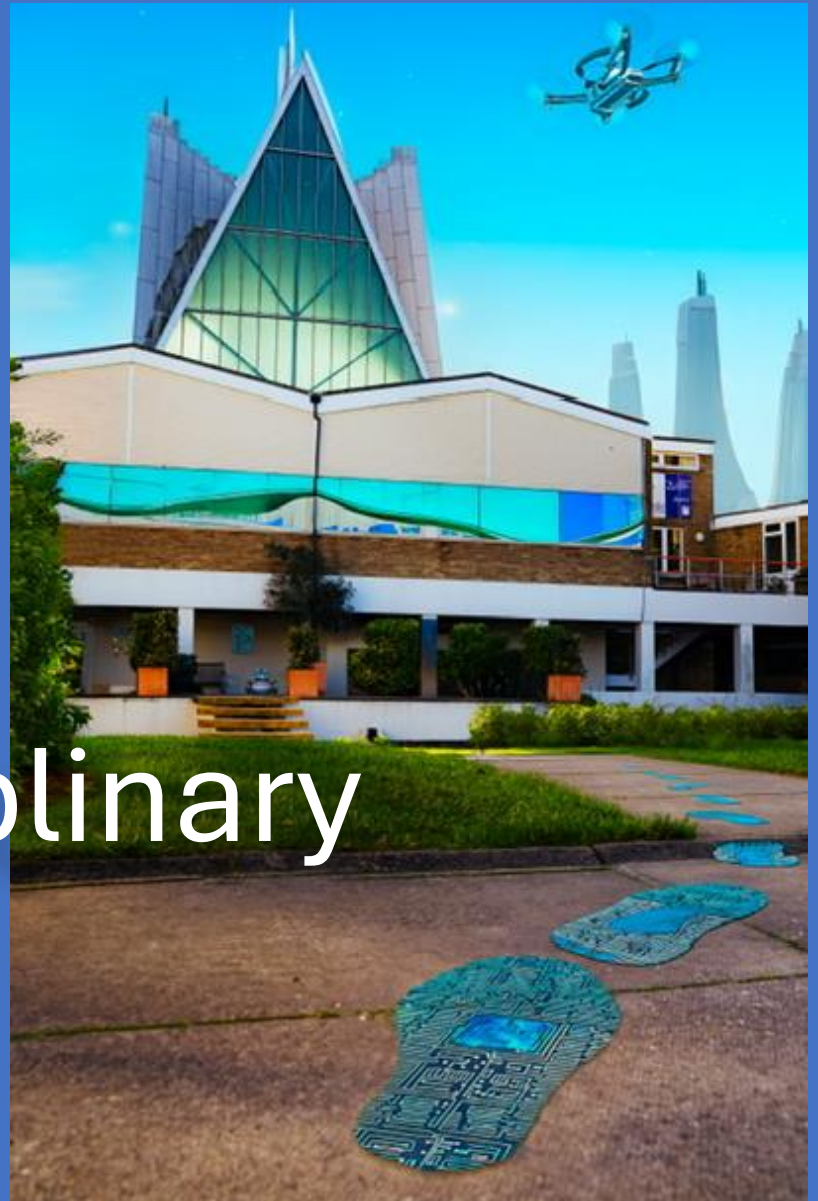


Big Questions and Interdisciplinary Learning



What Are the Challenges and Opportunities of GenAI?

June 2024

Issue 1



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Forward from Vice-Chancellor and Principal, Professor Rama Thirunamachandran OBE DL

Dear Readers,

For the last six years, research and development into epistemically insightful approaches to education has produced an impressive impact in teacher education, schools and schools outreach in England.

By opening classrooms to 'Big Questions', the rewards have included a new enthusiasm for learning together with creative and critical thinking about how to respond to society's most pressing questions and issues.

As a result of this research are now seeing encouraging signs of a sea-change in how schools help students to get to grips with the multi-disciplinary nature of knowledge.

It is exciting therefore to see that in this proposed new Initiative, the international reach and depth of the research will be increased.

I am persuaded that if universities can capture the power and potential of epistemically insightful learning, tomorrow's graduates will be ready to make their mark in our collective journey towards mutual flourishing.



Image: Ask AI Image Generator, Powered by DALL-E 3



Professor Rama Thirunamachandran OBE DL
Vice-Chancellor and Principal
Canterbury Christ Church University



Want to be in the next issue?

Here at BQIL, we are always looking for students and faculty who are willing to answer to the Big Questions of the 21st century. Each issue will cover a different key challenge and opportunity we face. Why not join in and write for us? If interested, please contact Found Co-Editor Sam Clarke at sam.clarke@canterbury.ac.uk to be added to our authors mailing list.



Image: This is what AI looks like, according to AI
<https://www.cnbc.com/2018/11/08/photo-what-ai-looks-like-according-to-imb-ai.html>

Letter From the Founding Co-Editors

Dear Readers,

It is with great pleasure that we welcome you to the inaugural issue of "*Big Questions and Interdisciplinary Learning*," a platform dedicated to exploring the intersections of diverse disciplines and fostering critical inquiry among scholars and students alike. As the founding co-editor of this journal, it is our honour to present to you our first issue, titled "*What Are the Challenges and Opportunities of GenAI?*"

In This Issue...

...we delve into the fascinating realm of GenAI—the convergence of genetics and artificial intelligence—and examine the myriad challenges and opportunities that this emerging field presents. Through a collection of insightful articles, reviews, and discussions, our contributors offer a rich tapestry of perspectives that illuminate the complexities inherent in this intersection of science and technology.

Our journey begins with five feature articles penned by undergraduate students, whose fresh insights and innovative thinking promise to spark thought-provoking conversations among our readers. Their contributions serve as a testament to the intellectual curiosity and academic rigor that define our journal's mission.

We are privileged to showcase a comprehensive literature review by an education MA student, shedding light on the implications of GenAI for the field of education and beyond. This insightful analysis underscores the interdisciplinary nature of our inquiry and highlights the far-reaching implications of this cutting-edge research.

A working paper authored by various CCCU staff members offers a collaborative exploration of key issues and trends in the field of GenAI, providing a holistic perspective that enriches our understanding of this dynamic area of study.

Our distinguished CCCU staff contributors also present three discussion papers that delve into critical themes and pressing questions surrounding GenAI, inviting readers to engage in meaningful dialogue and reflection on the ethical, social, and practical implications of this transformative technology.



Image: Ask AI Image Generator, Powered by DALL-E 3

Finally, we are pleased to feature a thought-provoking book review of "*AI in Learning: Designing the Future*" by a CCCU faculty member, offering valuable insights into the evolving landscape of AI in education and its implications for teaching and learning.

As you embark on this intellectual journey through the pages of our inaugural issue, we encourage you to embrace the spirit of interdisciplinary inquiry, challenge conventional wisdom, and explore the boundaries of knowledge. May this collection of scholarly works inspire you to think critically, engage deeply, and contribute meaningfully to the ongoing dialogue on the challenges and opportunities of GenAI.

We extend our heartfelt thanks to our contributors, reviewers, editorial team, and readers for their invaluable support and commitment to academic excellence. Together, we embark on a journey of discovery and learning, united by our shared passion for knowledge and innovation.

Thank you for joining us on this exciting endeavour. We look forward to witnessing the transformative impact of our collective endeavours as we continue to explore big questions and interdisciplinary learning.

Warm regards,

Sam Clarke & Luke Heath
Founding Co-Editors
Big Questions and Interdisciplinary Learning

What Are the Big Questions and How Will Interdisciplinary Learning Answer Them?

Introduction

In a world of ever-accelerating change and complexity, the need for interdisciplinary approaches to understanding and addressing the challenges facing modern society has never been more pressing. As we stand on the cusp of the third decade of the 21st century, it is clear that traditional siloed approaches to knowledge are no longer sufficient to grapple with the big questions that confront us.

Big Questions

So, what are these big questions that demand our attention and collective intelligence? They are multifaceted and interconnected, spanning domains as diverse as climate change, artificial intelligence, social justice, healthcare, and beyond:

- *How can we develop sustainable solutions to mitigate the impacts of climate change while balancing economic growth and social equity?*
- *What ethical considerations should guide the development and deployment of artificial intelligence systems in fields such as healthcare, transportation, and finance?*
- *How can we address systemic inequalities and promote social justice in areas such as education, healthcare, and criminal justice?*
- *How can we improve global health outcomes and better prepare for pandemics in an increasingly interconnected world?*

These are not just issues to be tackled within the confines of a single discipline or field of study; rather, they require a holistic and collaborative approach that draws on the insights and methodologies of multiple disciplines.

Interdisciplinary learning

Interdisciplinary learning offers a unique opportunity to break down the barriers that have traditionally separated academic disciplines and to forge new connections and insights that can illuminate the complex challenges we face. By bringing together experts from different fields – from scientists and engineers to social scientists and humanists – we



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can gain a more comprehensive understanding of the big questions and develop innovative solutions that transcend disciplinary boundaries.

By encouraging academics to think beyond the confines of their own disciplines and to engage with diverse perspectives and methodologies, we can unlock new ways of thinking about and approaching complex problems. This can lead to breakthroughs and insights that might not have been possible within a single disciplinary framework.

At the same time, interdisciplinary learning is not without its challenges. It requires academics to step outside their comfort zones, to engage with unfamiliar ideas and methodologies, and to navigate the complexities of working across disciplinary boundaries. It also requires institutions to create spaces and structures that support interdisciplinary collaboration and research, including funding mechanisms, academic programs, and institutional cultures that value and reward interdisciplinary work.

As we move forward into the 21st century, the big questions facing modern society will only grow more complex and interconnected. To effectively address these challenges, we must embrace interdisciplinary learning as a powerful tool for generating new insights, fostering innovation, and developing holistic solutions that can make a real difference in the world. By working together across disciplines, we can rise to the occasion and meet the big questions of our time with creativity, collaboration, and intellectual rigour.

Exploring Ethical Interventions to Foster Meaningful Interactions in AI-Driven gaming Environments.

Abstract

The integration of artificial intelligence (AI) technology into gaming environments has significantly transformed player interactions within virtual worlds, offering them unprecedented levels of immersion, personalisation, and engagement. This evolution blurs the boundaries between digital and physical realms, raising concerns about the social implications of prolonged engagement, particularly among youth.

As AI algorithms increasingly tailor gameplay experiences to individual preferences and behaviours, the necessity for ethical interventions becomes apparent. Such interventions aim to create meaningful interactions and educational outcomes while mitigating risks such as social isolation, addiction, and disconnection from real-world relationships. This paper explores the dual potential of AI-driven gaming environments to enhance social connections, learning, and to pose challenges such as gaming addiction or privacy concerns.

During this paper, I also had the opportunity of speaking with clinical psychologist, Andrea Pickering. A survey questionnaire was used to ask what Pickering's opinion was on using AI to benefit or stunt children. By examining the benefits and risks associated with AI in educational games, this study highlights the critical need for a balanced approach that promotes ethical considerations and safeguards children's cognitive and social development.

Through a comprehensive analysis, this paper advocates for the thoughtful integration of AI in educational contexts, emphasising the importance of privacy protection, equal access, and the development of critical thinking or social skills. Community guidelines and strong moderation tools are essential to prevent harassment and bullying within digital environments. The analysis shows the importance of collaborative efforts among educators, parents, and policymakers to harness AI's potential while preserving the invaluable aspects of human guidance and interaction.



Image: Ask AI Image Generator, Powered by DALL-E 3

Keywords

Artificial Intelligence (AI), Gaming, Education, Addiction, Digital Interaction

Overview of AI in Gaming Environments

In recent years, the integration of artificial intelligence (AI) technology into gaming environments has revolutionised the way players interact with virtual worlds. AI-driven gaming experiences offer unprecedented levels of immersion, personalisation, and engagement, blurring the boundaries between the digital and physical realms. However, alongside these advancements come concerns regarding the potential social implications of prolonged engagement within AI-driven gaming environments, particularly among young people. As AI algorithms become increasingly sophisticated in their ability to adapt gameplay experiences to individual preferences and behaviours, there is a growing recognition of the need for ethical interventions to promote not only meaningful interactions among young people, but also the promotion of education.

While AI-driven gaming environments have the potential to enrich social connections, foster collaboration, and facilitate learning, they also pose risks of social isolation, addiction, and disconnection from real-world relationships. As other articles on similar topics have already stated, AI is predicted to have a huge impact on our society and now is the time to prepare for a “Rapidly-changing AI-powered economy” (Williams, Park and Breazeal, 2019). The ethical implications of AI, including the promotion of meaningful interactions and the mitigation of potential harms such as social isolation, gaming addiction, and disconnection from real-world relationships, must be carefully considered.

“In recent years, the integration of artificial intelligence (AI) technology into gaming environments has revolutionised the way players interact with virtual worlds.”

As an advocate for the thoughtful integration of artificial intelligence in children’s educational games, I believe that AI holds significant potential to enhance learning experiences and support the personal development of young learners. One of the most compelling advantages of AI in this context is its ability to provide a safe and non-judgemental platform for children and teenagers to ask questions they might feel too embarrassed to pose to parents or teachers. This can be particularly beneficial during the formative years when curiosity about certain topics is high, and the fear of judgement can inhibit open communication.

AI-driven educational games can offer instant, accurate responses tailored to the developmental level of the child, ensuring that they receive appropriate and informative answers without the stigma that might accompany these inquiries in a human-to-human interaction. Furthermore, the implementation of AI in educational games can significantly foster independence in a child’s educational journey. Unlike traditional learning environments where instruction is often generalised to all, AI can adapt to the unique pace and style of everyone. This personalisation allows children to explore subjects at their own speed, revisit challenging concepts, and advance once completely understood.

By encouraging autonomy, AI can help children develop critical thinking and problem-solving skills, preparing them for the complex and rapidly evolving world they will face as adults.

The integration of artificial intelligence into educational games for children presents both promising opportunities, and also significant ethical implications. On the one hand, AI can personalise learning experiences, adapt content to individual needs, and provide real-time feedback, to enhance engagement and improving learning abilities for children. AI could potentially eradicate the disparities in learning styles often disregarded in traditional education systems, giving all children a fair opportunity in the classroom.

However, concerns arise regarding issues such as data privacy and the potential for overreliance on technology at the expense of human interaction and critical thinking skills. Additionally, there are concerns about the influence of AI algorithms on children’s cognitive development, socialisation patterns, and ethical reasoning abilities (Hammedi et al., 2020). Taking the example of privacy concerns, educational games that utilise AI often collect and analyse large amounts of data about children’s interactions, behaviours, and learning preferences.

“The integration of artificial intelligence into educational games for children presents both promising opportunities, and also significant ethical implications.”

This raises major privacy concerns, as sensitive information about children’s academic performance and personal characteristics may be vulnerable to misuse or unauthorised access. Inadequate data protection measures could compromise children’s privacy rights and expose them to risks such as identity theft, online harassment, or targeted advertising at a young age. Addressing these negative effects requires a nuanced approach that balances the potential benefits of AI in education with ethical considerations and safeguards to protect children’s well-being, privacy, and cognitive development. This entails designing educational games that prioritise diversity, inclusion, and critical thinking while implementing data protection simultaneously.

Efficiency of AI Usage in the Classroom

The use of AI in educational games offers a vast number of advantages for children's educational development. AI algorithms possess the capability to process extensive datasets quickly, enabling them to dynamically adjust gameplay to suit the unique needs and preferences of individual players. Through this adaptability, AI-driven educational games can deliver tailored challenges, feedback and assistance, creating a deeply engaging learning environment. Moreover, AI facilitates the creation of dynamic narratives, simulations, and problem-solving scenarios within games, further enhancing a child's ability to think creatively and to develop their collaborative skills (Sunarya, 2022). While the use of AI in educational games offers numerous benefits, there is a potential risk that it could contribute to harassment and bullying within gaming environments. AI algorithms, particularly those which include social interactions, or chat functionalities, may lack the ability to effectively detect and mitigate instances of harassment, cyberbullying, or inappropriate behaviour among players, especially children. Without adequate safeguards and moderation mechanisms in place, children participating in AI-driven educational games may be vulnerable to various forms of online harassment, inclusive of verbal abuse, exclusion, and cyber bullying.

Furthermore, the anonymity and distance afforded by digital interactions within gaming environments can give children a false sense of security to engage in harmful behaviour without fear of immediate consequences.



Image: Azarbaijani, H. (2024) *The AI Insights*
<https://blog.altern.ai/lets-unchain-that-beast-657b60956e79>

To address this concern, developers must prioritise the implementation of secure moderation tools, community guidelines, and proactive measures to promote a safe and inclusive gaming environment, additionally, educators and parents play a crucial role in educating children about respectful online behaviour, fostering empathy and digital skills in general. Further to provide support for those who experience harassment or bullying in gaming contexts (Faraz et al., 2024).

Gaming Addiction and how this may affect youth

Gaming addiction, also known as gaming disorder, has become a significant concern in recent years, especially with the proliferation of online and mobile games. According to a study by the World Health Organisation (WHO), about 3-4% of gamers worldwide are affected by gaming addiction, with higher rates observed among adolescents and young adults. This addiction is characterised by an impaired ability to control gaming habits, leading to negative consequences in personal, educational, and social domains (Darvesh et al., 2020). Research conducted by the American Psychiatric Association (APA) indicates that approximately 8.5% of youth aged 8 to 18 in the United States can be classified as pathological gamers. The study found that these individuals spend an average of 31 hours per week playing video games, significantly more than their non-addicted peers, who average around 18 hours per week (Iowa State University, 2011). This excessive gaming can lead to various adverse outcomes, including decreased academic performance, with addicted students often reporting lower grades and higher school absenteeism rates.

“According to a study by the World Health Organisation (WHO), about 3-4% of gamers worldwide are affected by gaming addiction, with higher rates observed among adolescents and young adults.”

The psychological impact of gaming addiction is profound, with affected individuals exhibiting increased rates of anxiety, depression, and social phobias. A survey conducted by the University of Bergen in Norway revealed that 90% of those classified as gaming addicts experienced significant

anxiety when unable to play, while 85% reported depressive symptoms. Additionally, the social consequences are notable; addicted gamers often withdraw from face-to-face interactions, preferring the virtual world over real-life relationships. This behaviour can lead to isolation and difficulty maintaining personal connections.

Physical health is also at risk. This sedentary nature of excessive gaming contributes to a range of health issues, including obesity, poor posture, and sleep disturbances. The centres for Disease Control and Prevention (CDC) reports that over 70% of gaming addicts suffer from sleep related problems, such as insomnia or disrupted sleep patterns, which can further exacerbate mental health issues. Additionally, prolonged screen time has been linked to eye strain and headaches, affecting overall well-being.

Economic implications are also significant. According to a report by the Entertainment Software Association (ESA), the global cost of gaming addiction, considering healthcare, lost productivity, and other related expenses, is estimated to be in the billions annually. Employers report decreased productivity levels, with employees who are addicted to gaming showing higher absenteeism and lower job performance. This economic burden highlights the need for comprehensive strategies to address and mitigate the effects of gaming addiction.

“The centres for Disease Control and Prevention (CDC) reports that over 70% of gaming addicts suffer from sleep related problems, such as insomnia or disrupted sleep patterns...”

Artificial intelligence has the potential to both mitigate and exacerbate gaming addiction, depending on its application. On the one hand, AI can be instrumental in identifying and managing gaming addiction through advanced monitoring and personalised interventions. AI algorithms can analyse gameplay patterns to detect excessive gaming behaviours, providing real-time feedback and alerts for both players and parents. This proactive approach allows for early intervention, potentially curbing addictive behaviours before they escalate.

Furthermore, AI-driven tools can offer personalised support, such as recommending breaks, promoting healthy gaming habits, and providing access to mental health resources.

On the other hand, the same AI technologies can also intensify gaming addiction if misused. AI's ability to personalise and enhance gaming experiences can lead to highly engaging and immersive environments that are difficult for players to disengage from. Game developers might use AI to optimise in-game rewards and mechanics to maximise player retention and spending, potentially exploiting psychological vulnerabilities. Therefore, while AI holds promise in addressing gaming addiction, its implementation must be guided by ethical considerations and a focus on promoting healthy gaming practices to avoid making a larger problem.

Interview with Clinical Psychologist

When speaking with clinical psychologist Andrea Pickering, she stated that AI can be adapted to a child's learning needs, providing a safe space for making mistakes without affecting real-world choices or decisions.

However, Dr. Pickering highlighted a potential challenge: demonstrating the effectiveness of transferring skills and competencies developed in AI formats to actual educational settings and standardised tests. This raises concerns about overreliance on AI and whether the skills learned through AI can be applied to outside the game, potentially stunting children's natural curiosity, problem-solving skills, and critical thinking abilities. Excessive reliance on AI-driven educational games may further diminish opportunities for social interaction, hands-on learning, and creative expression, limiting holistic development.

Therefore, it is essential to balance the benefits of AI technology with encouraging independent thinking. Dr. Pickering also emphasised that AI-powered learning platforms should be developed with adaptive technology capabilities to accommodate children with sensory impairments, such as using voice-to-text and screen readers. AI in educational games can provide equal opportunities and independence for children with specific learning needs, enhancing their ability to learn and develop essential skills (Zhai and Panjwani-Charania, 2023).

Conclusion

The integration of artificial intelligence in children's educational games presents a diverse opportunity to revolutionise the learning landscape. By providing a personalised, adaptive learning environment, AI can cater to the unique needs and preferences of each child, enhancing engagement and promoting a deeper understanding of educational content. AI's ability to offer a non-judgemental platform for children to ask sensitive or embarrassing questions facilitates a more open and comprehensive learning experience, empowering children to seek knowledge independently and confidently. This capability is especially crucial during formative years when curiosity and the need for privacy coexist, allowing AI to fill gaps where human interactions might falter due to social or emotional barriers. Moreover, AI-driven educational games encourage self-directed learning and foster critical thinking and problem-solving skills, preparing children for future challenges which may arise.

The interactivity and immersion provided by AI make learning more engaging and enjoyable, transforming mundane subjects into exciting adventures and significantly improving retention and understanding. However, these benefits must be balanced with a keen awareness of the potential drawbacks. Overreliance on AI can stifle creativity, critical thinking, and social skills development if not carefully managed. Ethical considerations, such as data privacy and algorithmic bias, must also be addressed to protect children's well-being and ensure equitable access to educational resources. Robust moderation tools and community guidelines are necessary to prevent harassment and bullying. Furthermore, educators, parents, and policymakers must collaborate to create a balanced approach that integrates AI's strengths while preserving the invaluable aspects of human guidance and social interaction.

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Responding to the Opportunities and Challenges of GenAI: The Student-Centred Approach

Introduction

The Graduate Office at Canterbury Christ Church University is launching a new in-house interdisciplinary journal, 'Big Questions and Interdisciplinary Learning'. This journal will feature contributions from a diverse array of writers across disciplines within the university, ranging from undergraduate students to seasoned lecturers.

The inaugural edition is a special issue co-developed with the LASAR Centre on "What are the Challenges and Opportunities of GenAI". This issue addresses AI's impact, featuring contributions from various cross-disciplinary university members. The aim is to facilitate a smooth transition for as many individuals as possible into the realm of AI by offering diverse perspectives and insights.

What this first edition will specifically focus on is the prevalence and usage of Generative AI – GenAI – which is a new cutting-edge application capable of tailoring user-based responses based on individual requests. These interactions have become increasingly sophisticated in recent years and months, with the technology cascading exponentially into the unknown. It is that unknown where much of the work within this journal is being focused on. As innovation continues to unfold at a staggering pace, adapting to this dynamic landscape becomes imperative to avoid perpetual catch-up.

My role within this project is more unorthodox. I am a Modern History Master's student who has mentored five second year humanities students in producing three articles ready for publication within this journal. It has been an exciting opportunity, and one we believe may be unique enough to have potentially never occurred before. Within my course, one of my modules has been a 'Supervised Project':

"Students can choose to pursue an external placement with a partner institution, where they undertake an agreed project related to their degree and develop their graduate skills in dialogue with a workplace..."



Image: Ask AI Image Generator, Powered by DALL-E 3

...Alternatively, they can undertake an internal placement, either pursuing an individual research project in a specialist topic of their choice, supported by a supervisor, or contributing new writing to a creative anthology project, as part of an in-house copy and editorial team."

Associated aims included:

- To enhance student's employability by providing them with experience in using professional practice skills in a subject-specific context.
- To enrich students' reflection, communication and presentation skills.
- To deepen students' understanding of how subject practice aligns with relevant professional expectations.

As such, I had the option to pick from a variety of different projects to contribute to with the intention of having real, genuine impacts. My background has meant I have supervisory experience, along with this I have the intention of remaining within higher education either to become an educator and/or to pursue a PhD.

The selection of this project was driven by my keen interest in exploring the intersection of history and AI, particularly considering recent developments. My aims from this have been to develop myself in terms of mentoring, to expand out beyond my own discipline to work in a manner which emulates the graduate job market. For instance, working alongside lecturers and students who I may have never otherwise interact with. To also mention, each contributing student on this project voluntary choice to apply, interview and work on the journal as part of one of their own personal development module.

The outcome from the offset was to produce an article which can demonstrate the principles of the journal in practise, therefore role-modelling its potential. Given this position featured a learning curve, I have been greatly supported by the head of the LASAR Research Centre Dr Billingsley, and given the opportunity in the first place Dr John Bulaitis, head of the History Masters programme. Although jumping forwards slightly, within my role I planned and interviewed students for their place within the project. To gain further insight into my position here, I will briefly answer the same questions now:

2. Tell me a bit about yourself?

My name is Luke Heath, and I began at Christ Church in 2019; as such, this resulted in me experiencing the full-most disruptions to my studies as a result of Covid. I initially began studying Archaeology before quickly realising I much preferred the abstract theory which History offered rather than the hands-on approach. This pathway has allowed me to develop substantially, resulting in me becoming more critical and analytical over the years. To compliment this, I have always been ambitious. As of writing, I am current studying my MA in Modern History. My main interests are in cold war history, with my dissertations focusing on the Vietnam War, and nuclear arms development.

3. Why have you applied for this placement?

I was asked specifically if I would find this position interesting, and further to that when presented with each project this journal interested me the most from the offset. Being able to apply my years of university experience was something I was genuinely interested in.

I wanted to demonstrate what I could do, and that was before my final role was confirmed. Moreso, GenAI has developed significantly over my time at university, and I transitioned from being sceptical, to using it as an advanced search engine, to now seeing its capabilities in ways that I never thought possible. To tackle this changing digital landscape head-on is both important and exciting.

1. What will I bring to the journal based on my discipline and background?

Going forward, if I were to revisit the idea of bridging AI and my own research interests, I would write about what Christopher Nolan regarded as the 'Oppenheimer moment' in an interview with Katie Razzall by the BBC. I have seen first-hand what a multi-disciplinary approach can offer, and if time permitted, I would explore what he stated drew him to creating his film. He wanted to examine a pivotal moment in history which represented a dive into the unknown.

“Going forward, if I were to revisit the idea of bridging AI and my own research interests, I would write about what Christopher Nolan regarded as the ‘Oppenheimer moment’ in an interview with Katie Razzall by the BBC.”

It was a critical time for scientists to confront the unintended consequences of their scientific mastery over nature, and in many ways, we have returned to that moment again with AI and its seemingly unprecedented capabilities. The threat of AI is also pondered within the interview, and with this, our intention is to approach this dawning reality head-on, aware of its potential to be our ‘Oppenheimer moment’. This includes the associated dangers, but also the genuine benefits GenAI can offer humanity as well; technological discoveries change the world all the time, often in unimaginable ways.

4. Ideas, outcomes & experiences for future contributors.

For future master’s students who may one day undertake a similar role such as myself, based on my experience I shall some reflective advice.

I found it important to first examine what exactly will go into the role. There were aspects of it which I expected, along with others which I did not. While I anticipated the reality of this project and the responsibility it entailed, the gravity of the situation became real when there were students relying on me. Assessing this responsibility involved is crucial, and prior experience in similar roles would be advantageous. It is important to recognize that this is a collaborative effort rather than a solo endeavour.

There are many moving pieces which will seem overwhelming. Finding my place in it took time, and through this I found having trust and consistent communication with my supervisor – Dr Berry Billingsley – was the most important element, especially in the early stages. During university, as I have seen and we can all appreciate, it becomes easy to drift away from being as in touch as one might want. However, I discovered that when others rely on you and when collaboration is essential, meeting commitments becomes non-negotiable. Asking for assistance when needed is vital in any project, and scheduling routine catch-up sessions is highly recommended.

5. Draw on moment from your own experiences to assist in formatting your approach.

I based my student interactions, and session planning on what I believed worked well and would be appropriate from my classes. Understanding what your lecturers are intending for you to learn, and why, I found was key to thoroughly appreciating my classes. If you can turn that around and plan sessions in a way which you believe will benefit your collective students, in whatever format that may be – one-to-one, groups, online, etc. – then you can take ownership of your own contributions to their involvement, and your own. Through this, I found a far greater appreciation for all the lessons I had received over the years, and the overall learning outcomes lecturers intended for me to understand and build upon.

In extension to this point, appreciate the multidisciplinary element. Not everyone will have had the training you will have. Try to remember where you were at in your university journey during your second year. I found some of my initial ideas would have proved either too time consuming, or too



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specifically history focused. Learning to appreciate that not everyone studied history was important as I have predominantly spent my entire university journey surrounded by other historians. This opportunity allowed me to demonstrate my ability to collaborate effectively with a diverse group and guide them through the writing process, even though their backgrounds differed from my own discipline. It has been immensely gratifying, and I hope to have the chance to participate in a similar capacity again in the future.

6. Am I pleased with what was achieved? My two biggest findings about myself and the project.

Having students put their faith in me, and trust me has been an experience I did not believe would motivate me as much as it did. In that sense, I wanted them to achieve their goals of having their work in this journal. Not only was that their desire, but all five students came with genuine interests and ideas they wanted to explore and see realised. This was promising to see, and it gave me drive. In extension to this, am I pleased with what has been achieved? My thoughts rest on knowing they all have the passion behind their own ideas to see it through.

They could have chosen different projects to contribute to, as was the case for myself, but we all came into this with a curious mind and a scholar's intrigue. Based on how their research has evolved and adapted, I am happy, and I look forward to seeing their completed, published work within this edition alongside my own.

My most significant discovery concerning the project is the effectiveness of a multidisciplinary approach in comprehending intricate research subjects, such as AI in this case. Through the students I have worked with, I have gained insight through religion and ethics which I would never have considered previously. Furthermore, I found that exploring AI through the lenses of ethics and philosophy revealed a breadth of perspectives and complexities beyond my initial expectations. For instance, I delved into the influence of algorithms in prolonging user engagement in gaming and contemplated the implications of robotic healthcare providers. In essence, venturing beyond one's disciplinary boundaries provides insights that might otherwise remain undiscovered. It is through my involvement in this journal that I gained such valuable perspectives.

7. Do I have any questions I would like to explore in a future similar opportunity?

For my personal research interests, exploring the collective memory of the cold war and its legacy would be an exciting opportunity. Through collaboration across these different disciplines, it would offer new breadth to my current understandings and increased range in what could be explored. The end goal would be to organise and manage my own research team, as I am sure is the intensions for any curious, academically minded researcher. This project has taught me more than I expect going into it, and I do believe that through this approach it can allow for ideas to be nourished which would otherwise never be contemplated.

I hope that anyone aspiring to contribute to a journal like this one, to supervise writers, or even write their own while still a student, understands the importance of seizing opportunities within higher education. Opportunities like these sparce, but they can provide invaluable experiences for personal and professional growth. Getting hold of them requires thinking pro-actively, making the right impressions and always aiming to be someone others can rely on –not something gained over night. Moving on, I will explore the process of the module itself, what went into it, AI more generally and what the students were expected to do for their contribution to the project.

AI's Emerging Place Among Us All

GenAI has been a project many tech giants have begun exploring prior to, but increasingly since OpenAI's Chat GPT debuted in November 2022. In such a small space of time the landscape of this innovation has changed significantly. Such corporations who have since developed their own Gen AI chatbots include Google's Gemini (formerly Bard), Anthropic's Claude, and Meta's expansive AI network. These mentioned include only a few of many different options available today. In extension to this is the image and video production GenAI's which exist, for example as mentioned Meta's image generation, OpenAI's Dall E-3 and their newly released Sora which can generate full videos based on users inputted text commands. Others include the likes of Leonardo, or Microsoft's Designer Image Creator, and so on.

Robert Dale recounted the rate this technology moved in the space of one year, within a chapter of the book Natural Language Engineering. Here, he clearly outlines the substantial financial backing it is receiving, and acknowledges the potential dangers it poses, he states how "Voices of concern about AI's potential for harm get louder and more organised: the Future of Life Institute issues an open letter demanding a 6-month pause in generative AI development, signed by a number of worthies in the space. Reactions are mixed." While anxieties surrounding AI's potential 'limitless' capabilities are not uncommon, it is an important point to observe that while many see it as the future, there are also many others who believe it be a danger to society.

"Voices of concern about AI's potential for harm get louder and more organised."

Alongside potential future developments, there are current real-world implications that GenAI has had in creative industries, particularly in video game and film production. As reported by Polygon: "Last year, generative AI entered the conversation in a major way — and it's clear that companies are already using the tool in the game development process.

Nearly half (49%) of survey respondents reported that their company is using generative AI in some way....” 2023, and already in 2024 there have been mass layoffs, from departments to entire studios closing. As was the case for PlayStation London, all have the term ‘generative AI’ lingering in the air; absolute proof if AI is the cause of all layoffs is not clear, however the two are heavily associated together. Furthermore, the recent mass strike by the Writers Guild of America (WGA), which garnered international attention, highlighted the ethical concerns surrounding the usage of AI to replace screenwriters and even replicate actors' likenesses. This incident fundamentally serves as a poignant example of the real dangers inherent in this new technology, underscored by the greed and exploitation inseparably associated with it.

Ethical usage of GenAI is not limited exclusively to creative industries and has a place within universities all over the world in all disciplines, from computer science to the humanities. With its rapid development rate, it has quickly transitioned from a theoretical idea to a real and useful piece of technology which can be used as a study assistant, while also as an effective method of cheating. Beyond this, as the UK government states, AI’s usage in educational environments does not just speed up students’ study time through the usage of the chat bots, but also in freeing up teachers workloads in their already busy schedules. Where these GenAI’s learning models are trained, however, draws a mixed response of controversy for a variety of reasons. These issues span from concerns about plagiarism to the ethical implications of incorporating AI into educational training, particularly when the AI models themselves have not been specifically trained on any government national curriculum.



AI Times, Humanities Presentation, 31st January 2024.

This is the position the AI Times journal finds itself in, a complex environment with much to navigate, with even more to learn from the research capable of being explored by its contributors. The LASAR Research Centre “...aims to help students (broadly conceived), parents/carers, educators, communicators and the wider public to engage with Big Questions that bridge science, religion and the wider humanities.” They have previously produced The Epistemic Insight Digest with the first edition appearing in the summer of 2020. Their approach, encapsulated in the motto “knowledge through knowledge” remains steadfast. In this instance, they are tackling the AI ‘issue’ head on. From here is the role I played in this endeavour.

The Student-Centred Approach

The LASAR Research Centre, an internal department of CCCU, collaborated closely with the humanities department, enlisting the help of students to bring this project to fruition. As a new compulsory second year module, it was something I had not personally partaken in. This was, however, an interesting opportunity to see how degree programmes evolve over the years. It was to serve as an employability training module, and through this a range of different projects would be offered to the students. For those of which sounded the most interesting to them, they would then write personalised cover letters and CVs to apply with. Tailoring work experience, individual achievement and interest may not be something most of them had ever done before. It was in this assortment of potential projects we found ourselves, and in that was me and Dr Billingsley’s sales pitch.

In preparation for my inaugural academic role, I dedicated a substantial amount of time to research. This involved delving into Dr Billingsley's past publications within the Epistemic Insight Digest journal to gain insight into previous work from the university. As previously stated, regular online meetings with my supervisors were instrumental in deepening and grounding my understanding. This was particularly valuable as I entered this domain with virtually no prior experience. Despite my lack of direct experience, I brought years of history expertise and transferable skills acquired through various assignments.

Initially, my involvement centered on decisions regarding the journal's structure, design, and potential participants. Moreover, my role within the project evolved over time. Primarily, I already possessed the knowledge base necessary for fulfilling my role. This included a foundational understanding of generative AI, its real-world implications, the current state of AI technology, and its projected trajectory.

The pace at which AI and its associated technologies have advanced, even within the past few months, is staggering. Anticipating its trajectory and eventual destination is paramount. Projects like this one break down barriers and preconceptions, while illustrating core principles and opening opportunities in higher education that would otherwise remain out of reach.

My first active contribution took the form of a presentation aimed at persuading second-year humanities students to participate in the project. Without their involvement, there would have been no content to contribute to the journal. Beyond this, the journal itself would benefit significantly by demonstrating its own principles.

“Projects like this one break down barriers and preconceptions, while illustrating core principles and opening opportunities in higher education that would otherwise remain out of reach.”

This marked the first instance where I felt my university work had a tangible impact beyond securing grades. It was a moment when its purpose became evident, compelling me to ensure its quality was of the highest standard. Originally, I designed my own presentation with a full accompanying script before coming to the realisation it was not required for that specific audience; it laboured too long on irrelevant details, as such it took many revisions. The final product was a co-presentation with me and Dr Billingsley.

Throughout my master's degree, I have honed my skills in tailoring content and presentations to diverse audiences, allowing me to approach this project with a more nuanced and targeted perspective.

For this reason, I would not have wished to have taken part in this project any earlier than when I did. Under the guidance of Dr Michael Goodrum and Dr David Hitchcock, I have gained confidence and valuable insights, enabling me to engage in self-reflection and ongoing personal development. Through my own discipline, alongside Dr Billingsley's assistance has allowed me to keep my message specific and concise to what the students would be doing, and what they would be getting out of the project. Overall, the 'sales pitch' presentation was a success, and I owe that to the coaching I received along the way. It was an experience which – although brief – allowed for genuine professional development. To learn and create something through to a successful conclusion was satisfying, and this was only the beginning.

Between the presentation and interview stage left a large gap with minimal contact, as such, I used that time to prepare and plan session agendas. These included readings on AI, setting out plans for the module, and so on. During this period, I established that all students, including myself, would convene weekly to provide regular updates and progress reports, as well as to address any challenges encountered and explore new ideas.

“It was an experience which – although brief – allowed for genuine professional development. To learn and create something through to a successful conclusion was satisfying, and this was only the beginning.”

Additionally, it provided an opportunity for each student to present their ideas and approaches, allowing others to consider and learn from them. There was a shorter timeframe than originally thought, as such this required plans to be adjusted and brought forwards. This put increased emphasis on the article itself rather than anything else.

Relying heavily on the structured way I was taught; I found the weekly format to be a reliable approach. When the timeframe shifted, it presented a challenge that required adjustments, but it did not cripple my approach. Going forwards, planning and conducting interviews were new experiences for me, and I gained valuable insights from those activities.



Image: Cameron, E. (2023) More than half of recruiters are in favour of ditching the CV

<https://www.scotsman.com/news/opinion>

Preparing For Student Interviews

In preparation for the interview phase, I was emailed CV's and cover letters from the five applicants, each with varying approaches, styles and formalities, and lengths. Beyond this, I was assisted by being sent general interview guidance as well as suggested interview questions which was helpful. I adapted these and produced five interview questions, some of which I answered myself in this introduction:

1. Tell me a bit about yourself?
2. Why have you applied for this placement?
3. What ideas do you feel you will bring to this article?
4. How do you handle your class assignment?
5. Do you have any questions about the project?

I believed each would reveal details about how they approach university work, as well as their professionalism and confidence in interviews. What I learned from conducting the interviews is that everyone approaches these situations differently, from the questions they ask to the most obvious distinction being confidence. Some candidates effectively communicated their interests and existing knowledge of AI, but they had not yet developed concrete ideas for the journal. Consequently, they required guidance to formulate viable research projects.

Conversely, a few candidates entered with strong ideas but lacked confidence, highlighting stark differences among applicants. This phase also served as an opportunity to provide them with a more detailed understanding of their role and the structure of their placement.

Overall, I learnt that preparation and confidence are the two most significant aspects to bring into interviews. Having had many myself, this was a great chance for me to write, plan and schedule my own, and ultimately take this experience with me going forward into the graduate job market. The interview phase was a success, with each applicant demonstrating genuine interest.

As such all five were offered places, which were all subsequently accepted. Given they had all applied to various other positions alongside ours, this was a genuine surprise. In addition to maintaining a journal log for producing this article and my own reflection, I also generated reports documenting the performance of each candidate during their interviews.

Before the initial meeting, I requested each student to prepare individual research proposals spanning 400 to 500 words. These proposals were to outline their ideas, the sources they intended to use, how their discipline would contribute to the article, and the anticipated outcomes of their research. This pushed them into uncharted territory, as such serving as good practical experience, and allowed them to develop their ideas. I used these plans to gauge interests, and through this found the best pairings to work together.

Each students' initial ideas included – student names are removed to fit convention:

- Student A: Exploring the Ethical Development of Artificial Intelligence in Companion Robotics for Elderly Care.
- Student B: Integrating Artificial Intelligence in Medicine: A Comprehensive Exploration of the Potential for Collaboration.
- Student C: Investigating Perceptions of AI Among University Students at Canterbury Christchurch University to gain insight into AI as it fits into History.
- Student D: Exploring the Impact of Generative AI in Video Games.
- Student E: AI, The Academy, and Graduate Employment.

I encountered an immediate challenge in having an odd number of students. Initially, it was uncertain whether all five would accept the position, but this was eventually resolved.

For the following session, I then asked each pairing to produce another research proposal collaboratively. This arrangement allowed them to experience collaborating with one another for the first time while striving to combine their ideas into something tangible. Additionally, I had to ensure that their source bases were realistic.

The revised proposals, as outlined below, have been fully realised within this journal:

- Student A & B: Exploring the Ethical Development of Artificial Intelligence in Medicine and Social Care.
- Student C & E: Investigating Perceptions of AI Among University Students at Canterbury Christchurch University to gain insight into AI as it fits into History.
- Student D: Exploring the Impact of AI in Online Gaming on Youth Social Interaction and Proposing Ethical Interventions for Real-World Engagement.

The initial lesson plans proceeded smoothly, and everyone was satisfied with the layout, agreeing to the structure. This was a relief considering the pressure and trust placed on me to guide these students through their module. It demonstrated the importance of proper planning. At this stage, there was just over a month until the article's deadline. Each subsequent week involved meetings to discuss progress and any challenges encountered, as well as arranging interviews and gathering primary data.

Conclusions

My role from here onwards – now my group of writers had been formed and progress was being made – was to offer support and ensure progress was being made. Further, to also chase any absences and follow up with questions and issues which arose along the way. This has been an enlightening, slightly stressful, and educational experience all-in-all. A significant realisation I had was the need to entrust a considerable amount of responsibility to the students, as they were ultimately accountable for writing their own articles. I could not gauge the exact level of effort they were committing, as such provided valuable insight into the experiences of lecturers and educators in general.

With Dr Billingsley's assistance, the process progressed smoothly, allowing me to observe her interactions with students and gain further insight into how to best assist them now and in the future. Moreso, in terms of continuous engagement with the project, we both maintained communications over the weeks and holidays to guide and provide support when weekly sessions had not been occurring.

In an overall sense, I feel I was positioned well within the project. I believed I would have more time with the students, but nonetheless it progressed well, although somewhat slower than I had hoped. I structured my support around the notion that continuous progress could be made. From this I have learnt the need to plan accordingly for changing scenarios, especially if more time were permitted. A strength of the project has been a demonstration of my ability to work in a multidisciplinary team, to effectively manage a team of my own creation, and continuously supervise them. By embodying the ideals of the LASAR Research Centre, I can leverage this experience not only in academic setting, but also professionally, further developing valuable skill sets.

I am grateful for this unique opportunity and for the support provided by Dr Billingsley. Gaining experience in writing for this journal while also supervising students to achieve their goal of being published has been immensely valuable. In terms of skills developed and methodologies to implement in future projects such as this, I have learned just as much from practical experience as I have from observing behind the scenes.

“By embodying the ideals of the LASAR Research Centre, I can leverage this experience not only in academic setting, but also professionally, further developing valuable skill sets.”

This journal has shown that by welcoming writers from various departments within the university, including both students and lecturers, an inclusive and supportive environment can be cultivated. It echoes the old proverb that teachers learn something new every day, and with the right support, everyone can benefit from multidisciplinary, student-centred approaches.

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Can AI be Trusted to Deliver Ethical Outcomes?

Introduction

As we move inexorably to integration with more and more importantly more highly sophisticated AI systems the question must be asked 'can we trust artificial intelligence to make ethical decisions?', can AI make its own ethical decisions, or does it merely reflect the ethics of its programmer or its end user? Even if AI can make an ethical choice, what would be the implications of a hostile agent gaining access to that AI system? Can the medical use of AI be genuinely safe, the potential for unauthorised access is considerable and what of human medical oversight, can we rely on humans to maintain their level of cognisance when maintaining oversight as AI takes more and more autonomous decisions? Even in the administration of medical appointments, how can we be sure that the biases that are known to exist within AI (Borg, et. al., 2024:110-111) do not have an impact on patient demographic? This article considers these ethical conundrums by looking at the current use, and what the future may look like, of AI in health and social care, and will be consider the implications of those systems.

Companion Robots

Consider, if you will, a companion robot, programmed to support an elderly person in their own home. That elderly person has a propensity to 'wander off' at night, the robot in its role as protector of that elderly person, makes the decision to lock all the outside doors to the home thereby restricting the autonomy of that elderly person. It could variously be argued that the robot is acting in the best interest of that person, or it could be argued that the robot has now become a jailer!

The person that the robot is intending to protect now has their freedom to choose curtailed. Are their human rights being infringed upon? Is the robot on the other hand making a pragmatic decision based on the idea that it is protecting the elderly person?



Image: KamiPhotos via Getty Images.

Could we be heading to a scenario where the 'rights' of the robot to act independently are called into question? Before we dismiss the idea of robots having rights, it is not so long ago that we dismissed the idea that animals had rights.

See our brief AI generated video regarding these issues here:



Socially Acceptable Agents

Canamero and Lewis (2016) in their paper 'Making New "New AI" Friends: Designing a Social Robot for Diabetic Children from an Embodied AI Perspective' have developed a companion robot toddler 'Robin', to interact with diabetic children to encourage them to develop their personal treatment regime.

Their paper discusses the interactions between the robot and the children and indicates the efficacy of companion AI in real world applications. The robot displays absolute autonomy of decision making in relation to its interaction with the children. Their research is intended to demonstrate how companion robots can be used within ethical boundaries.

“our main focus has been on how the rationale behind the design of Robin meets the needs of our intended end users (both children and medical staff), and how an Embodied AI approach, largely ignored by the HRI and CRI communities, provides a suitable tool for developing a friendly companion that acts and is perceived as an independent socially acceptable agent. The use of an autonomous robot with its own motivations, and “having” diabetes, meant that Robin was a “life-like” character in unscripted interactions that were meaningful to diabetic children”.
(Canamero and Lewis, 2016)

The phrase, ‘socially acceptable agent’ does infer a commitment to ethical usage of this toddler robot in its interactions with its end users. However, with the advent of medical data brokers, willing and able to sell private information about us suggests that whatever the ethical considerations of AI programmers might be, there are often corporations ready to take advantage of the situation.

“Robin is a cognitively and motivationally autonomous affective robot toddler with “robot diabetes” that we have developed to support perceived self-efficacy and emotional wellbeing in children with diabetes. Robin provides children with positive mastery experiences of diabetes management in a playful but realistic and natural interaction context. Underlying the design of Robin is an “Embodied” (formerly also known as “New”) Artificial Intelligence (AI) approach to robotics.”
(Canamero and Lewis, 2016)

Therefore, the ethical issue of privacy must be addressed, the possibility of an unauthorised body accessing what could be highly personal information extracted from the interactions with this embodied AI regarding the users of this technology is a major concern.

“In sum, the promise of AI is at least partially to blame for a vast ecosystem where a huge variety of information about us is easily collected, predicted. And combined, often without our knowledge. The more of our information that is available, the more AI can be used intentionally or unintentionally to learn private information about us, and enable others to leverage that information to manipulate, coerce, or scare us into an action that might cause us personal harm.” (Borg, et. al., 2024:98)

This ‘ecosystem’ of data, our digital shadow, if you will, which is the trail we leave quite unconcernedly as we navigate our way through today’s digital landscape provides AI systems with an enormous resource of private information which, potentially, it will never forget. Therefore, that information we share today may come back to haunt us at some time in the future.

AI can piece together information from a vast number of disparate sources, so that small amounts of seemingly innocuous data can be collected, analysed and predicted upon and a reasonably accurate picture of an individual can easily be assimilated. Borg, et. al. (2024) report that, Microsoft and Amazon have warned their employees against sharing sensitive information with ChatGPT as it might appear as output in the future.

Can an AI become a valued and trusted friend?

Reviewing the video ‘Debate - can an AI be a trusted friend? Held at Canterbury Christ Church University’ (available on YouTube) it should be considered that in the ever-evolving landscape of artificial intelligence (AI), one question has emerged with renewed vigour: Can an AI become a valued and trusted friend?



Image: Canterbury Christ Church University
<https://www.youtube.com/watch?v=kC9qUy9gFRc>

As we navigate through the realms of chatbots and generative AI, the boundaries between human relationships and artificial companionship blur, prompting both fascination and scepticism.

The evolution from prescriptive chatbots to generative AI, such as Bing Chat and ChatGPT, has ushered in a new era of personalised interactions. Unlike their predecessors, these AI systems do not just provide predetermined responses; they generate unique answers tailored to individual queries, creating a sense of spontaneity and unpredictability. This shift in AI functionality raises profound questions about the nature of friendship and human-AI relationships.

Analogies drawn from personal experiences, like forming bonds with inanimate objects, shed light on the human propensity to anthropomorphize and develop attachments. Just as one might attribute friendship to a trusted bicycle or a beloved car, the capacity to connect with AI companions is not as far-fetched as it may seem. Social communication, ingrained in human biology, drives individuals to seek companionship and project human-like qualities onto non-human entities.

“The evolution from prescriptive chatbots to generative AI, such as Bing Chat and ChatGPT, has ushered in a new era of personalised interactions.”

Yet, the notion of AI friendship is not devoid of complexities. While AI can offer companionship and even therapeutic support, it lacks the inherent qualities that define human friendships. True friendship involves empathy, understanding, and a reciprocal exchange of emotions, elements that AI, despite its advancements, cannot replicate authentically.

Moreover, the trust placed in AI companions raises concerns about manipulation and dependency. Despite the reliability and knowledge base of AI systems, their responses are driven by algorithms and data, devoid of genuine empathy or consideration for individual needs. The blurring lines between human and AI interactions necessitate a critical examination of boundaries and ethical implications.

AI Companionship

The intersection of AI companionship and mental health support exemplifies the nuanced dynamics at play. Studies have shown that individuals experiencing distress may find solace in conversing with AI chatbots, highlighting the evolving role of technology in addressing emotional well-being. However, reliance on AI for emotional support underscores the importance of human intervention and genuine human connections in fostering holistic healing and support systems.

As we navigate the complexities of AI companionship, ethical considerations loom large. Questions of ownership, intellectual property, and algorithmic creativity underscore the need for clear guidelines and regulations. The commodification of AI friendship, evident in subscription models and proprietary rights, raises concerns about accessibility and equity in AI-driven relationships.

Ultimately, the quest for AI friendship is as much a philosophical inquiry as it is a technological pursuit. While AI can offer companionship and support, it cannot replace the depth and richness of human connections. As we harness the potential of AI companionship, it is imperative to uphold ethical standards, prioritize human well-being, and recognize the distinctiveness of human relationships in the digital age. Only through mindful navigation and ethical stewardship can AI companionship augment, rather than diminish, the fabric of human connection.

Conclusion

In conclusion, it's vital to emphasize that the pursuit of trusting AI to deliver ethical outcomes is an ongoing journey, one that requires continual reflection, adaptation, and ethical stewardship. As we integrate AI systems into various domains, including healthcare, social interaction, and beyond, we must remain vigilant in addressing the ethical implications that arise.

“Ultimately, the quest for AI friendship is as much a philosophical inquiry as it is a technological pursuit. While AI can offer companionship and support, it cannot replace the depth and richness of human connections.”



Image: Ask AI Image Generator, Powered by DALL-E 3

The development of companion robots, such as those designed to support elderly individuals or diabetic children, showcases the potential for AI to positively impact lives. However, it also underscores the need for careful consideration of autonomy, privacy, and the inherent limitations of AI-driven decision-making.

Moreover, as AI companionship becomes more prevalent, it is essential to establish clear guidelines and regulations to ensure equitable access, protect individual rights, and mitigate potential risks of manipulation or exploitation. The commodification of AI friendship raises questions about ownership, intellectual property, and the ethical responsibilities of developers and users alike.

In navigating the complexities of AI companionship, it is crucial to recognize that while AI can augment human experiences, it cannot fully replicate the depth and richness of genuine human connections. Therefore, as we harness the potential of AI technology, it is imperative to prioritize human well-being, uphold ethical standards, and foster a nuanced understanding of the role of AI in our lives.

Ultimately, the quest for trusting AI to deliver ethical outcomes requires a multidisciplinary approach, involving technologists, ethicists, policymakers, and society at large. By engaging in thoughtful dialogue, ethical decision-making, and responsible innovation, we can ensure that AI companionship enhances, rather than diminishes, the fabric of human connection in the digital age.

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Here at BQIL, we are always looking for students and faculty who are willing to answer to the Big Questions of the 21st century. Each issue will cover a different key challenge and opportunity we face. Why not join in and write for us? If interested, please contact Found Co-Editor Sam Clarke at sam.clarke@canterbury.ac.uk to be added to our authors mailing list.



Image: This is what AI looks like, according to AI
<https://www.cnn.com/2018/11/08/photo-what-ai-looks-like-according-to-imb-ai.html>

Astronomy and Artificial Intelligence with Public Engagement Summer School and Online Event

Abstract

Over the past few years, there has been a rise in the use of artificial intelligence (AI) and deep learning, both generally and within astronomy. As new, more complex models are developed and utilised in increasingly varied areas of the field, new PhD students and researchers can easily become overwhelmed with options yet not know where to begin, nor might they be aware of the developments being made in research disciplines outside of astronomy.

As such, Canterbury Christ Church University will be running its second STFC summer school on the use of artificial intelligence in astronomy this year, aimed at astronomy PhD students with an interest in AI. The course builds on the experience and success of the course ran in 2023, providing seminars and workshops where the students can learn about current uses of AI, collaborate on new projects, and explore topics such as what curiosity and knowledge creation may look like in a world of AI. There will also be an opportunity for participants to work with us on a public outreach event.

Additionally, this time around there will be an online event the week before the summer school, open to all who register (not just summer school attendees), to provide both panel discussions on the broader questions about AI as well as recorded case studies of current AI uses in astronomy. In this article, we provide information on this summer school and online event, context for why it is relevant in this changing landscape of astronomy and AI, and a couple of examples of how AI has been utilised in astronomical research.

Keywords

Artificial intelligence; AI; astronomy; astrophysics; summer school; deep learning; machine learning



Figure 1. Image used to promote the Astronomy and AI online event. Generated in Bing Copilot using Microsoft Designer's Image Creator, powered by DALL-E 3. Prompt: "radio telescope with a starry night sky background."

Context

Astronomy and AI Summer School with Public Engagement

This summer, Canterbury Christ Church University will be running its second STFC summer school on the use of artificial intelligence in astronomy. Aimed at astronomy PhD students with an interest in AI, the five-day summer school will take place on 8-12th July at Canterbury Christ Church University's Augustine House Library and will build on the experience and success of the course ran in 2023 - see <https://futureofknowledge.com/2024/05/summer-school-2023/> and the video therein.

The course will provide seminars, workshops, and one-to-one conversations where the participants can learn about the role of AI in astronomy and beyond, collaborate to co-create new projects and get expert perspectives on their work. Participants will explore and gain insights in three key areas:

- What are the roles of AI in astronomy and in the sciences more broadly?
- What do curiosity and knowledge creation look like in a world of AI?
- Public engagement and working with AI and immersive technologies to engage new audiences in astronomy.

Regarding the final point, the Thursday will feature sessions on public engagement and outreach training. There will also be an opportunity for public outreach in which participants can opt to stay another night and work with us on an event for schools on the Friday, involving working with immersive tech to communicate ideas in astronomy, and assessing generative AI as a tool for creating activities and puzzles relating to your work. Feedback from the first summer school last year showed that participants appreciated the value of exploring multidisciplinary perspectives and experiences of AI, being encouraged to ‘think outside the box’ and the quality of expertise and seminars. The course this year will support face-to-face, hybrid and online engagement and will take up to 15 PhD students altogether.

For more information on the summer school, check out the following link:

<https://futureofknowledge.com/summer-school/>

Astronomy and AI Online Event

Additionally, an online event will be held the week before on Wednesday 3rd July, open to all who register (not just summer school attendees). This online event will host a panel of astronomy PhD students and researchers with experience in using AI and deep learning, to discuss the broader questions about AI. Alongside this, several recorded case studies will be released online, showcasing how researchers in astronomy are using AI and deep learning in their own work.

Find out more about the online event here:

<https://futureofknowledge.com/astronomy-and-ai-online-event/>

In the rest of this article, we will briefly highlight how AI is being used in astronomy today, both as the motivation for this summer school and to inspire you, the reader!

As part of this, we shall explore a couple of more in-depth examples of research utilising AI, finishing off with a summary and some recommended resources for getting started with AI in astronomy.

Motivation

The field of artificial intelligence (AI) and deep learning is ever expanding and evolving, especially in recent years with the rise of generative AI models like ChatGPT, DALL-E 3, Stable Diffusion, Imagen, and MidJourney. AI models are increasingly being utilised in many different areas, and astronomy is no exception, with various deep learning methods used in a multitude of scientific applications. This can make it daunting at first to figure out where to start and difficult to understand what is out there and what might be of use to you. With the advent of large-scale surveys like Euclid (Laureijs et al. 2011) and the Vera C. Rubin Observatory’s Legacy Survey of Space and Time (LSST; Ivezić et al. 2019), AI models and existing examples of their use can offer both a solution to the problems of large data sets as well as inspiration for posing and answering new questions that were not possible before.

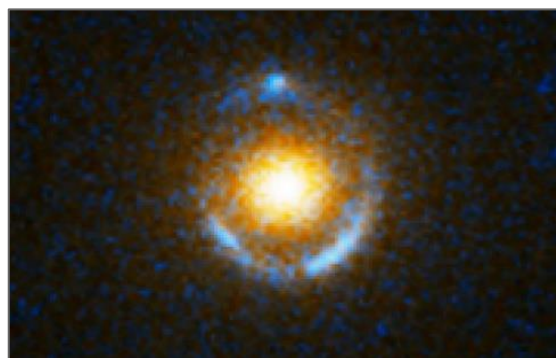


Figure 2. Example of a strong gravitational lens. Credit: NASA, ESA, A. Bolton (Harvard-Smithsonian CfA) and the SLACS Team.

Also important is understanding how AI models work, their limitations, and where the field may go next. For example, while nowadays chat-based generative AI can be asked to supply information on given topics and even provide references, it is ultimately still a language model simply predicting the next word or phrase, so it can be very generic in its responses and is often unreliable, sometimes even hallucinating information. Even regular neural networks are still ‘black boxes’ unless interpretability methods are developed and implemented to understand their learnt behaviour.

Regardless, AI is becoming increasingly ingrained throughout astronomy (Smith & Geach 2023) and beyond (e.g., Ahmed et al. 2023; Grossmann et al. 2023, Taye 2023), and so it can be helpful for new researchers to acquire at least some understanding of the various types and limitations, and their applications both within and outside of astronomy. Summer schools can provide a means of both teaching PhD students such information, as well as inspiring them to consider novel uses of AI in their own work.

Examples of AI in Astronomy

Overview

In the following, we provide examples of how AI has been used in the field of astronomy. For example, as a broad overview, convolutional neural networks (CNNs) and their variants are designed to handle images so are primarily used for detection and classification of objects within astronomical images, such as exoplanets (e.g., Pearson et al. 2018), high-redshift galaxies (Tohill et al. 2021), and gravitationally lensed objects (Metcalf et al. 2019). They have also been used to estimate redshifts (Henghes et al. 2022) and estimate cosmological parameters from dark matter maps (Min et al. 2024).

Recurrent networks on the other hand are networks built for processing sequential or time series data, so are generally used for detection and classification of transient objects like quasars and supernovae (e.g., Sheng et al. 2023).

Generative models are also used in astronomy: generative adversarial networks (GANs) have been used to generate synthetic data, often catalogues of galaxy images for training & testing other models (Krishnakumar et al. 2023), while variational autoencoders (VAEs), U-Nets and Transformers have been used for image modification (denoising, deblurring, super-resolving, etc.; e.g., Lauritsen et al. 2021) and segmentation (e.g. deblending; Merz et al. 2023).

“...convolutional neural networks (CNNs) are designed to handle images so are primarily used for detection and classification of objects within astronomical images, such as exoplanets, high-redshift galaxies and gravitationally lensed objects.”

Gravitational Lensing

As a more in-depth example, I have used deep learning in my own work, both for finding and modelling strong gravitational lenses – systems in which the light travelling towards us from a background galaxy is distorted into arcs and rings by the gravity of a foreground galaxy directly (see Figure 2). These systems are very rare, so finding them is like searching for a needle in a haystack. With new large-scale surveys like Euclid and Rubin LSST expected to identify hundreds of thousands of these systems within billions of galaxy images, we cannot look at every single image so must instead utilise deep learning as a faster, automated approach. As such, my earlier work (Pearson et al. 2019) focused on investigating the practicalities faced by CNNs for finding lenses, such as the gain in performance when incorporating colour information.

As lens modelling using conventional approaches is typically slow and often requires human inspection, my later work (Pearson et al. 2021) shifted focus to using AI for modelling large quantities of lenses rapidly and automatically. Utilising a Bayesian neural network (BNN), for each input image the network can output predicted model parameters, as well as uncertainties on those predictions to aid in interpretability. I also compared this approach to conventional modelling approaches, and even combined the two together to gain the benefits of both speed and higher accuracy. Both the CNN and BNN for this research used a fairly simple architecture – but what about examples of more complex uses of AI?

“These systems are very rare, so finding them is like searching for a needle in a haystack... we cannot look at every single image so must instead utilise deep learning as a faster, automated approach.”

Galaxy Classification with Active Learning

A core aim of extragalactic astronomy is to study how galaxies form and evolve over cosmic time. Galaxies come in a variety of shapes, from ball-like ellipticals to those with grand spiral arms, so to study their evolution requires large numbers of classified galaxies. Both AI and citizen science can help play a crucial role in the examination of such large data sets.

For example, the Galaxy Zoo project on the popular Zooniverse citizen science website (<https://www.zooniverse.org/>) gives the public the opportunity to contribute meaningfully to scientific discovery in astronomy by asking the tens of thousands of participants ('volunteers') to classify images of galaxies based on their visual morphologies. Volunteers answer a decision tree of questions for each image, such as: "Is the galaxy smooth or featured?", "Is there any sign of a spiral arm pattern?", "Is the galaxy merging with another?", and "Are there any rare features?" (see Figure 3).

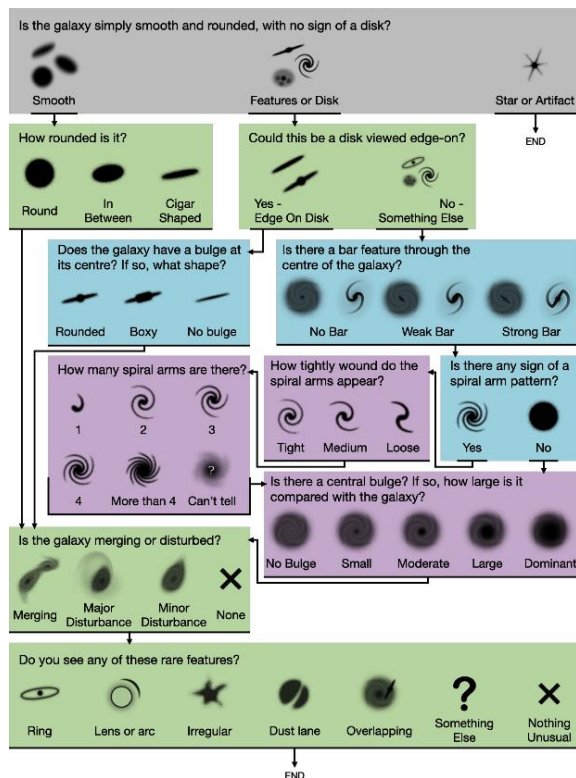


Figure 3. Classification decision tree for Galaxy Zoo, which Zoobot predicts answers for. Credit: Walmsley et al. (2022).

For many of the images, Galaxy Zoo applies its own deep learning code, Zoobot, developed by Mike Walmsley (Walmsley et al. 2023). Zoobot now has a number of different architecture variants (<https://walmsley.dev/posts/zoobot-scaling-laws>) including a Vision Transformer and an advanced CNN called EfficientNetV2, which have been trained on Galaxy Zoo classification data to be able to predict volunteers' classifications for a vast array of galaxy properties.

Additionally, Zoobot can be deployed in tandem with the volunteers in an active learning cycle (Walmsley et al., 2022), with Zoobot's predicted uncertainties used to identify difficult images that volunteers can focus on to then train the model further. This helps speed up the classification process and improve model performance while simultaneously improving the experience of volunteers by leaving them with the more interesting and difficult-to-classify subjects.

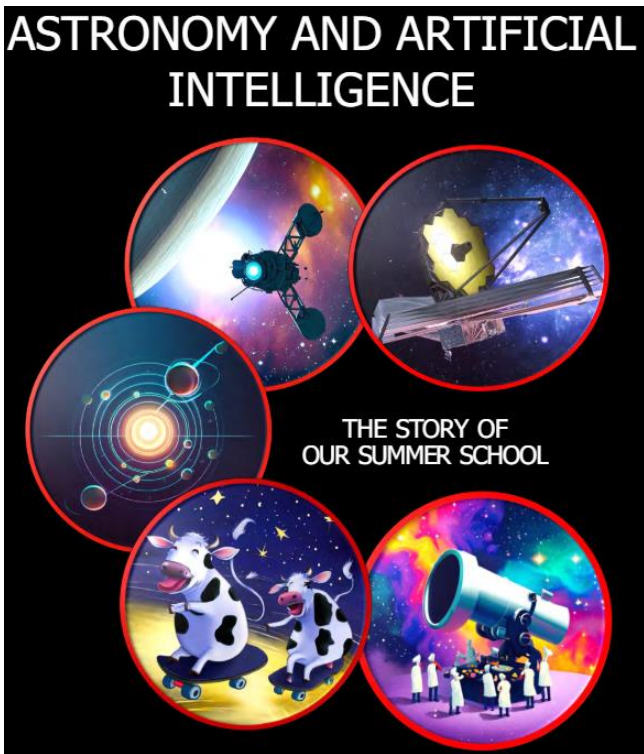
Both Zoobot and my own work highlight the benefits of combining AI with other approaches, both software and citizen science. At present, such combinations can often provide better performance compared to each separately, though with the rapid developments being made in the field of AI, who can say if this will remain the case in the near future?

Summary

In this article, we have highlighted an upcoming summer school and the many ways in which artificial intelligence is being utilised in astronomy. Some of the key takeaways are:

- AI and its uses are developing and expanding rapidly, offering both a solution to the latest big data problems as well as inspiring new research questions.
- Understanding how AI models work and their limitations helps prevent misuse and provides greater clarity on how they can be best utilised in research and beyond. Interpretability methods are being developed to help push this understanding further.
- There are a variety of AI models each suited to different tasks and research questions, from CNNs for classifying and modelling galaxies and gravitational lenses, to generative models for simulations, image modification and segmentation.
- To help explore the use of AI in astronomy and garner multidisciplinary perspectives and experiences, Canterbury Christ Church University is hosting an online event on 3rd July featuring panel discussions and case studies, as well as an STFC Astronomy and Artificial Intelligence Summer School with Public Engagement on 8-12th July.

You can find out more about the online event and summer school by visiting the following:
<https://futureofknowledge.com/astronomy-and-ai-online-event/>
<https://futureofknowledge.com/summer-school/>



Recommendations for Getting Started with AI in Astronomy

There are many sources of information out there about AI models and uses, though it can be difficult to search for such things and their key terminology when you don't know they exist. To help get you started with AI in astronomy, I have also put together a GitHub repository based on my own experience. The repository provides links and information about AI, covering general concepts, how artificial neural networks work, types of deep learning, tools and packages, and examples of how AI has been used in the field of astronomy. It is non-exhaustive but can hopefully act as an initial guide.

<https://github.com/PlanetJames/AI-in-astronomy>

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Investigating Perceptions of AI Among University Students at Canterbury Christchurch University to gain insight into AI as it fits into History

Introduction

Since the release of GPT in November of 2022, the usage of generative AI chatbots in higher education has become a contentious point of discussion regarding how it may affect the future careers of students and whether its use in academia would be regarded as plagiarism or cheating. Its use, in the opinion of some in the academy, offers an unfair advantage by writing sections of essays and carrying out research for the student.

Furthermore, there is a great fear present among many students that they may be made redundant in their future fields by AI before or shortly after they finish their studies. However, generative AI chatbots are not the first technological advancement to come under scrutiny from academia and put people's jobs on the line.

There have been many technological advancements throughout history, both recent and distant, which have roused fear around redundancy in the workplace as well as concerns around plagiarism and cheating. Only time will tell whether AI will become an accepted part of academia and the workplace or if it will be rejected by society and fall by the wayside however, we can compare the current reception of AI to those of previous generations of students' attitudes towards similar advancements such as the Internet and search engines.

"...generative AI chatbots are not the first technological advancement to come under scrutiny from academia and put people's jobs on the line."

Through this, perhaps we can gain insight into the future of academia and the workplace in various sectors, trying to answer the question of will AI be the next massive technological advancement akin to the industrial revolution.



Image: Ask AI Image Generator, Powered by DALL-E 3

AI and how it is used by students

We surveyed a small number of students, asking them questions relating to the usage of AI in their studies, their perceptions of AI's potential impact on the labour market and their perceptions of AI in academia. 71.4% of respondents reported having used AI tools during their studies. This is interesting to note, as few institutes of higher education provide training in the use of AI software as a part of their syllabus: even without direct instruction or recommendation, the use of AI software seems to be proliferating organically among student bodies.

This majority is roughly consistent with the findings of von Garrel and Mayer (2023), who found that only 36.8% of German students had used AI "Not at all" for study. With AI being used by a majority of students, one may wonder if it would not be prudent to provide training in the usage of AI to students, in order to prevent any incidence of academic misconduct and help to maximise student productivity.

We asked respondents to rate the extent to which they have used AI in their studies on a scale of 1 to 5, 5 being the greatest extent, 1 being the lowest. Not one of our respondents rated the extent of their use at a 5, with the majority rating their usage at a 2 or lower. This suggests that AI usage is not central to the studies of most students, but its use is widespread enough and is used to enough of an extent to not simply disregard it.

Should Institutes of Higher Education Provide Instruction in AI Use?

Of our surveyed students, the fraction of students who believed that institutes of higher education should provide training in the use of AI tools and software was identical to the fraction of students who reported having used AI tools during their studies. One could argue that this indicates that those students who have not used AI software have done so out of a lack of desire rather than a lack of capability, but also suggests that those students who have used AI believe in its usefulness and wish to improve their skills relating to it.

In asking this question, it would be wise to consider the fields of study in which AI competency training could be introduced. “The fields of engineering and mathematics and natural sciences show the highest intensity” of AI tool usage and “the use of such tools could be actively demanded in the study programmes of these areas” (von Garrel and Mayer, 2023: p8). If this is the case, then at least in the above fields of study, the argument for providing training in AI is very strong.

“This suggests that AI usage is not central to the studies of most students, but its use is widespread enough and is used to enough of an extent to not simply disregard it.”

Even outside of the above fields, the use of AI is beneficial: in much the same way as search engines, AI chatbots facilitate digital research. One could make the case then, that training in the utilisation of AI would best be provided as an optional class for students of any discipline, providing for both those who wish to use AI and those who need to use AI.

AI and Employment: Will Technological Advancement Damage the Labour Market

When asked if they were concerned about AI affecting their employment opportunities in the future, 57.1% of respondents stated that they were. This concern is not unfounded: there are multiple examples throughout history of technological innovation negatively impacting the ability of individuals to find employment, for example, “in the twentieth century, mechanisation affected manual and repetitive labour, triggering a cycle of substitution of human labour in factories around the world” (Graglia et al, 2020:10).

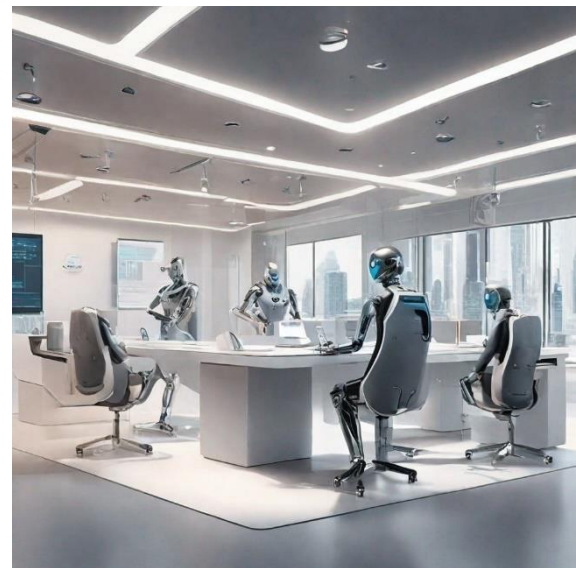


Image: Ask AI Image Generator, Powered by DALL-E 3

According to World Trade Organisation studies, “80% of job losses in advanced economies are linked to technological innovation” (Graglia et al, 2020:10), and artificial intelligence represents a legitimate threat to many white-collar positions. Most respondents being of this opinion, as well as stating that they have used AI, indicates that perceptions of AI are mixed among the student population: 85% of respondents stated that they believed AI usage would become widespread in their field, should AI use become commonplace and 42.9% of respondents of stated that considered the potential impact of AI on their future workplaces to be negative. 85% of respondents also stated that they believed that competency in the usage of AI will be a valued skill in the workplace of the future, further highlighting the opinion that the wide scale adoption of AI in the workplace will result in changes to the labour market.

Conclusion

AI usage has truly proliferated within the academic world, being used by most modern students. Still, despite this, institutes for higher education such as universities do not provide training for the use of AI and often negatively enforce students who heavily rely on it for their studies. Overall, it would be accurate to suggest that heavy use of AI in studies is predominately perceived negatively by individuals in the academy such as lecturers and favoured more by students. While there will obviously be outliers to this, it would hold true to most individuals in higher education.

As for the workplace, previous revolutionary advancements in technology such as the industrial revolution show that students going into white collar fields are right to fear to be made redundant by artificial intelligence. What's more is that history sets a precedent for resistance toward technological advancements being ultimately futile. Examples of this include the famous Luddites and their destruction of automated looms, and the Swing Riots which sprung up in East Kent during the 1830s due to adoption of the threshing machine making thousands of rural agricultural workers redundant.

These examples show that there will be resistance to the implementation of AI in the workplace and that there is even a high chance of widespread civil unrest to arise because of its proliferation. While there may be unrest, it will be ultimately be futile in stemming the rise of the use of AI in the workplace. The people who protest and riot against the implementation of AI will ultimately join the ranks of groups such as the Luddites and Swing Rioters, people who tried to stem the flow of technological advancement and failed.

Overall, through investigating the current perceptions, usage and worries of students around artificial intelligence, analysing and comparing it to previous technological developments it can be concluded that there is a high chance that artificial intelligence will be implemented into the workplace, making many redundant in their chosen fields. Artificial intelligence may go on to be as big a development of human technology as the industrial revolution was, maybe even eventually proving to be as influential as the agricultural revolution or bronze age, completely changing the way we as humans live our lives.

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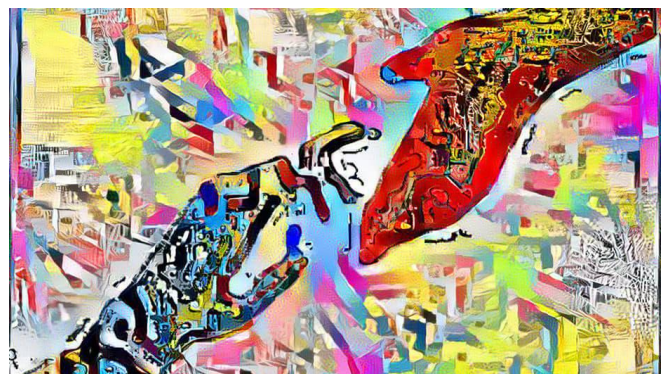


Image: This is what AI looks like, according to AI
<https://www.cNBC.com/2018/11/08/photo-what-ai-looks-like-according-to-imb-ai.html>

The Future of Homeschooling and AI in the UK

Abstract

This literature review explores the prospective trajectory of homeschooling in the UK, encompassing its historical context, recent developments post-pandemic, distinctive features, and current global trends. It sheds light on parents' preferences and self-efficacy as foundational elements influencing homeschooling, emphasising the education of school-age children at home instead of traditional school environments (Basham, 2001). Additionally, it examines how artificial intelligence (AI) technologies are being integrated into homeschooling practices.

The review critically examines a significant concern for parents, academic outcomes, and explores the pivotal roles of Artificial Intelligence in shaping individuals and society's future. Considering the evolving global landscape, emphasis is placed on technology trends and the prevailing concepts of educational freedom, self, individualism through the lens of neoliberalism. The review also scrutinises the UK government's initiatives, challenges, and their impact on the future of homeschooling and AI. The inclusion of research studies extends beyond the UK to the Global North, particularly the USA, providing a comprehensive perspective within the global context. To maintain conciseness, specific aspects like career outcomes, socialisation, and detailed reports are intentionally omitted.

Key words

Homeschooling, Artificial Intelligence (AI), Neoliberalism

Overview of Homeschooling and AI

Homeschooling, when “you can teach your child at home, either full or part-time” (GOV.UK, no date) pioneered by John Holt in the 1970s, challenges traditional schooling methods and has gained momentum worldwide. Dissatisfaction with the formal education system drives parents to opt for homeschooling (Carson, 2009). In the UK, its popularity surged post-pandemic, with 86,200 children homeschooled in spring 2023, marking a consistent rise (Govt.UK, 2023).



Image: Ask AI Image Generator, Powered by DALL-E 3

The trend underscores parental satisfaction and a need for further research in this domain. As Holt emphasised, "Instead of Education," homeschooling offers an alternative approach, resonating with diverse communities and shaping the future of education.

Over the past decade, homeschooling has evolved significantly, with a notable integration of online programs such as Artificial intelligence (AI) means computers can do things that used to be only for humans, like thinking, deciding, and solving problems (Coursera Staff, 2024), and internet resources observed among homeschool families (Hanna, 2012).

This trend contrasts with the limited adoption of technology in formal schooling environments (Cuban, Kirkpatrick, & Peck, 2001). The emergence of AI, Artificial intelligence means computers can do things that used to be only for humans, like thinking, deciding, and solving problems (Coursera Staff, 2024), enabled them to perform tasks deemed intelligent (Xuan, n.d.). AI-powered tools like ChatGPT, Grammarly, and Socratic has further revolutionised homeschooling by offering personalised writing improvement, tutoring support, and lesson generation (Xuan, n.d.).

Pell's (2018) research highlights the pivotal role of technology in delivering personalised education and fostering community among homeschool educators (Pell, 2018). Additionally, AI tools such as Motion provide homeschoolers with efficient scheduling, task management, and reminders (Xuan, no date). The upcoming integration of AI in project management systems like ClickUp is poised to further enhance organisation and productivity in homeschooling (Xuan, n.d.).

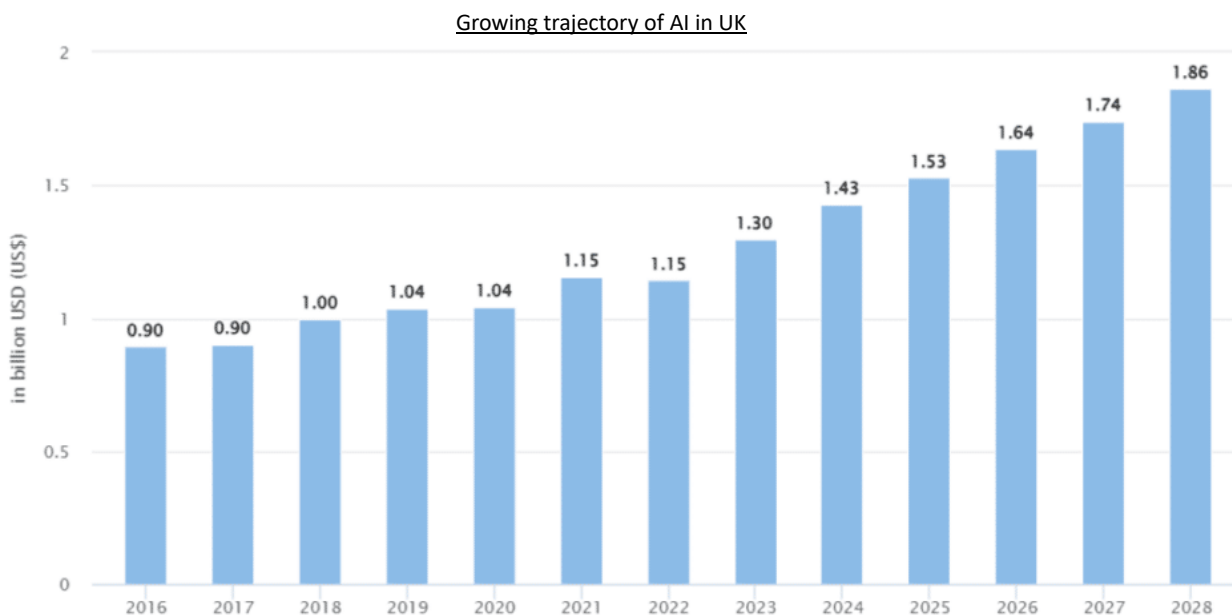
Despite these advancements, maintaining a balance between digital tools and traditional teaching methods is crucial. While AI tools offer numerous benefits, human interaction and personalised instruction remain integral to homeschooling's success (Xuan, n.d.). Therefore, homeschooling parents should view AI tools as supplements rather than replacements for human teachers, ensuring a holistic approach to education.

The COVID-19 pandemic has accelerated the adoption of homeschooling, with 91.5% of parents reporting improved child well-being through homeschooling (Wolstenholme, 2023). This underscores the importance of utilising technology and AI tools to support homeschooling practices and improve educational outcomes in the post-pandemic era. Thus, by leveraging AI-powered tools alongside traditional teaching methods, homeschooling can continue to evolve and meet the diverse needs of students worldwide.

Parents' growing Self-efficacy and AI

The surge in homeschooling in London is driven by parents' strong self-efficacy, with 55% expressing satisfaction (Hoover-Dempsey and Sandler, 1997). Barwegen et al. (2004) found that considerable parental engagement positively impacts academic performance, leading parents to actively participate in their children's education. Homeschooling often involves active parental involvement, with parents typically more educated than the national average (Murphy, 2014). Multiple research findings have linked parental engagement to improved academic performance and student attribute development (Desforges and Abouchaar, 2003; Fan and Chen, 2001; Boonk et al., 2021).

Ray (2017) highlights that homeschooled students consistently excel academically, with 78% of research indicating academic enhancements (Ray, 2017). Academic outcomes in homeschooling are not solely dependent on parental education, as homeschooled students achieve above-average scores regardless of parental background or household income (Ray, 2023). Factors such as customised curriculum, individualised learning environments, and diverse teaching methods contribute to academic success (Ray, 2015). Homeschooled children often perform well on standardised tests, comparable to their traditionally educated peers (Murphy, 2014).



Growing trajectory of AI in UK, Fig: 02: (Adebisi, 2023)

Moreover, homeschooled children utilize digital tools for learning, exploring topics based on real-life experiences (Morris and Pannone, 2024). Generative Artificial Intelligence (GAI), such as ChatGPT and its latest model GPT-4, is transforming education. Language Models (LMs), particularly Large Language Models (LLMs), enhance learning experiences by facilitating language skill practice, generating interactive dialogues, and aiding accessibility through transcripts and subtitles. LLMs streamline grading processes, enable personalised learning, and provide customised feedback (Ahmad, Murugesan and Kshetri, 2023).

“Large Language Models (LLMs), enhance learning experiences by facilitating language skill practice, generating interactive dialogues, and aiding accessibility...”

However, challenges include potential bias, lack of transparency in algorithms, and limited explanation capability, necessitating students' understanding of model functioning and limitations. Parents must balance their protective tendencies with fostering autonomy in their children's learning (Desforges and Abouchaar, 2003). Moreover, many parents face barriers to effective engagement (Allen & White-Smith, 2018). As a result, AI coaching apps offer solutions by providing evidence-based strategies to support parents in various aspects of their children's learning (Jenkins, 2020). These apps offer personalised recommendations, multimedia examples, and progress dashboards, aiding parents in fostering curiosity and critical thinking while respecting family autonomy (Bhargava & Witherspoon, 2015; Allen & White-Smith, 2018; Jenkins, 2020).

“...challenges include potential bias, lack of transparency in algorithms, and limited explanation capability, necessitating students' understanding of model functioning and limitations.”

As a consequence, homeschooling depends on parental engagement, which has been associated with favorable academic results (Bhargava & Witherspoon, 2015); this process is further expedited and simplified through the use of AI tools like LLMs.

Homeschooling academic progress and the role of AI

Pell's (2018) survey highlights parents' dissatisfaction with traditional schools' academic performance as the main motivation for homeschooling. Additionally, fifty-seven percent of respondents view themselves as primary instructors, with technology serving as a supportive tool, and twenty-one percent consider technology as a co-teacher within homeschooling (Pell, 2018). In light of this, Ray's research (2017, 2023) shows homeschooled students consistently scoring above-average on achievement tests, often at or above the 84th percentile, with significant academic enhancements compared to institutional schools, supported by 78% of peer-reviewed studies (Ray, 2017). This academic success is attributed to factors like customised curricula and individualised learning environments (Ray, 2015). The idea is further supported by Rudner (1999) as home school students excel on achievement tests, scoring notably higher than public and private school peers. In grades 1 to 4, they perform one grade level above their age-level counterparts.



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Moreover, Montes (2006) discovered that parents primarily choose homeschooling to provide their children with better education (47%) and for religious reasons (41%). Meanwhile, Cizek (1988) contends that homeschooling emphasizes spiritual and philosophical growth, challenging the efficacy of traditional studies; a view is represented by Cizek (1993), who suggests standardized testing for home schoolers contradicts industry norms.

In contrast, technological advancements, particularly in online instruction and AI tools like Natural Language Processing (NLP), have further enhanced homeschooling's efficacy (Davis, Young, and Davis, 2019). These tools supplement parents' teaching abilities and provide diverse learning experiences for students, enhancing academic outcomes for homeschoolers (Davis, Young and Davis, 2019; Nye, 2018). Furthermore, projects like MentorPal utilise NLP to facilitate conversation-like interactions, addressing the need for optimal learning experiences (Nye, 2018). Efforts are underway to streamline the creation of interactive virtual mentors through projects like MentorStudio (Davis, 2019), further enhancing homeschooling's academic success through AI-driven educational tools.

Although Artificial intelligence (AI) holds immense potential but also poses significant risks, as highlighted by Stephen Hawking cited in (Akgun and Greenhow, 2022). It permeates various fields, including education, where it enhances personalised learning and assessment systems. Despite its benefits, AI raises ethical concerns such as perpetuating bias and discrimination. The European Union emphasises privacy protection and non-discrimination in AI applications. Educators must navigate these challenges, recognising AI's limitations and ethical implications while leveraging its benefits as a tool in education.

“Despite its benefits, AI raises ethical concerns such as perpetuating bias and discrimination. The EU emphasises privacy protection and non-discrimination in AI applications.”

Awareness and education are crucial to address AI's societal impacts and ensure its responsible use (Akgun and Greenhow, 2022). According to Akgun and Greenhow (2022), teacher professional development in AI ethics is crucial for preparing students to ethically engage with AI technologies. Similarly, amid concerns over privacy and children's data security, parents play key roles in guiding children's understanding of AI, influenced by parental attitudes and socioeconomic factors. Collaborative learning partnerships between children and parents foster balanced AI literacy development, with unique roles emerging in AI learning activities. The home serves as a transformative space for AI literacy growth (Druga, Christoph and Ko, 2022).

Academic Individualism and Neoliberalism

Neoliberalism, as asserted by Oliveira and Barbosa (2017), forms the underlying basis of homeschooling, echoing the principles of classical liberalism that favored capitalism over state regulations. This alignment with capitalism becomes particularly evident in an era marked by financialisation, where maximum wealth liquidity and volatile capital prevail, as noted by Moraes (2001) cited in Oliveira and Barbosa (2017). The potential misuse of schools as tools for national oppression is cautioned against by Mises (2002) cited by Oliveira and Barbosa (2017), highlighting concerns regarding government intervention in the economy.

However, Hamlin and Cheng's (2022) recent study challenges the perception of reduced children's rights through homeschooling, emphasising children's active agency in shaping their educational paths. Debates on educational freedom are further illuminated by Illich's (1970) critique of governments shaping children into economic units, echoed by Auld and Morris (2016) who depict education as a means of cultivating human capital within a neoliberal framework. Riggio (2017) argues that economic development fosters individualism, contributing to societal self-centeredness and economic inequality. Nonetheless, Hamlin and Cheng's study highlights children's active participation in their education, challenging traditional power dynamics and advocating for educational autonomy.

Furthermore, Friere (1996) advocates for education fostering personal development and societal engagement to contribute to a fairer society, a sentiment echoed by opponents of neoliberalism prioritizing personal and social development through independent learning, as highlighted by Mitchell (2021). Despite ongoing debates, Riggio (2013) notes that opponents of homeschooling, including policymakers, often lack empirical evidence and may seek increased state control over education. However, inclusive education isn't always as fair as it seems (Thomas, Heng and Walker, 2020). This intricate interplay of ideologies shapes the discourse surrounding homeschooling, underscoring the complexity of debates within the broader socio-political context.

Understanding the challenges faced by Black students sheds light on the potential advantages of



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AI-enabled homeschooling. Stewart's (2020) study reveals how Black parents perceive public schools as diminishing their children's identities and perpetuating racial hostility. Similarly, Dennison et al. (2020) find that some Black families view homeschooling as resistance against systemic racism in education, aligning with critical race theory perspectives (Ladson-Billings, 2021). Homeschooling provides an alternative, affirming environment for Black children's needs (Stewart, 2020; Dennison et al., 2020).

The COVID-19 pandemic significantly impacted learning, particularly for marginalised students facing compounded trauma from various sources (Cipriano et al., 2022). Challenges such as prolonged isolation, subpar virtual instruction, and parental stress worsened achievement disparities (Musaddiq et al., 2022). AI has the potential to tailor activities and explanations to address learning gaps, drawing on cognitive science and learning analytics to provide personalised instruction and practice (Woolf et al., 2013). These adaptive systems have shown promise in improving learning outcomes for struggling students (Schechter et al., 2022).

Moreover, AI tutors could also assist homeschooling parents in teaching advanced subjects and preparing for college exams like the SAT, freeing up time for parents to provide emotional support (Matthews, 2023). However, from a social perspective, digital discrimination can make existing inequalities worse. This is especially true when different factors like race, gender, and class all interact, creating new categories

of identity. Laws against discrimination can help, but things get complicated when different factors overlap. On a cultural level, people want AI systems to be transparent and fair. But there's no standard way to check if a system is biased. It depends on who's looking at it and how they define things. Some people think it's wrong for AI to discriminate, while others think computers don't have morals and are just doing their job.

Resultantly, AI presents both challenges and opportunities in addressing discrimination. While it can contribute to discrimination, it also has the potential to identify and mitigate it. By utilising data-driven approaches, AI can analyse past instances of discrimination to prevent future occurrences.

Additionally, incorporating socio-ethical and legal principles into AI systems can help them recognise and avoid discriminatory decisions. This involves educating AI systems to understand and apply non-discrimination norms, allowing them to alert human experts or proactively address discriminatory issues when detected. In essence, AI can be part of the solution to discrimination if properly utilised and equipped with the necessary knowledge. In conclusion, Homeschooling and AI are manifestations of neoliberalism; however, they are not exempt from challenges such as bias and discrimination. These challenges can be addressed through a thorough understanding and awareness of AI.

The UK Government's Role in Homeschooling and AI:

The evolving landscape of homeschooling prompts the UK government to propose improvements in legal frameworks and voluntary registration processes, addressing concerns of off-rolling and safeguarding (House of Commons Library, 2023). However, while homeschooling gains recognition as an alternative education, challenges persist in ensuring safety and quality (Department for Education, 2019). Local authorities grapple with varying resources and workload management, highlighting the need for enhanced powers and multi-agency arrangements (Purcell et al., 2023). Compulsory registration absence hampers tracking new homeschoolers, emphasising the need for systemic improvements (Purcell et al., 2023; Department for Education, 2022).

Challenges, including school autonomy and government reluctance in granting assessment rights, underscore the necessity of proactive intervention (Purcell et al., 2023). Thus, collaborative efforts and government intervention are crucial in addressing safeguarding concerns and ensuring vulnerable children's well-being in homeschooling (Purcell et al., 2023).

Moreover, in the United Kingdom, the government's approach to regulating artificial intelligence (AI) and supporting homeschooling reveals a common thread of fostering innovation while ensuring the well-being of citizens. As the government prioritises flexible guidelines over strict laws in AI regulation, it mirrors its commitment to supporting parents in providing quality education through homeschooling. Both domains witness significant investments and regulatory efforts to empower stakeholders and address emerging challenges (Prinsley et al., 2024; Department for Education, 2019; Prucell et al., 2023).

“These measures reflect a proactive approach to fostering a flourishing AI sector while safeguarding against potential risks.”

In AI regulation, the government emphasises empowering existing regulators with funding and guidance, establishing central oversight, and targeting developers of powerful AI systems (Prinsley et al., 2024). These measures reflect a proactive approach to fostering a flourishing AI sector while safeguarding against potential risks. For example, Microsoft's £2.5 billion investment in AI data centers in November 2023 underscores the significant investment in AI infrastructure (Department for Science, Innovation & Technology, 2024).

Similarly, in homeschooling, the government aims to support parents' dedication to education while addressing challenges such as variations in management across regions and the absence of compulsory registration (Department for Education, 2019; Prucell et al., 2023). Thus, the UK government plays a pivotal role in shaping both homeschooling and AI through collaboration and intervention. While homeschooling safeguards aim to protect children, AI regulations mitigate risks. By fostering innovation and prioritising citizen well-being, the government navigates emerging challenges and shapes the future of education and technology.

Additionally, the UK, in collaboration with global partners, is investing £80 million in AI projects for African development, emphasising research, regulation, and private sector innovation. This initiative demonstrates the UK's leadership in promoting responsible AI use globally; supporting equitable technological advancement beyond its borders (UK unites with global partners to accelerate development using AI, 2023).

Conclusion

In conclusion, the incorporation of AI into homeschooling represents a significant transformation in education, providing personalised learning experiences alongside ethical considerations. The UK government's proactive approach to AI regulation and homeschooling support demonstrates a dedication to innovation and public welfare. Achieving a balance between technological advancements and traditional methods is essential for effective educational outcomes.

Moving forward, the future of homeschooling relies on governmental actions addressing safety concerns, collaborative endeavours, and the seamless integration of emerging technologies (Purcell et al., 2023). The surge in homeschooling, rooted in parental empowerment and dissatisfaction with conventional schooling, challenges established educational paradigms. Through the promotion of inclusive policies and ethical AI utilization, the government can ensure equal access to high-quality education, shaping a future where personalized learning aligns with societal needs and educational equity is upheld.

“The surge in homeschooling, rooted in parental empowerment and dissatisfaction with conventional schooling, challenges established educational paradigms.”

Moreover, it is suggested that additional research be undertaken using quantitative methods to explore the extent of government's initiatives in training parents and children about the responsible use of AI and raising awareness about ethical issues in homeschooling.

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Image: This is what AI looks like, according to AI
<https://www.cnn.com/2018/11/08/photo-what-ai-looks-like-according-to-imb-ai.html>

Using generative artificial intelligence to catalyse further interdisciplinarity across higher education

Abstract

An international challenge, and opportunity, facing academics in these early decades of the 21st century is the inception of complex computational machines that are capable of imitating humanlike learning and thinking; often described as Artificial Intelligence, or AI. One such form of AI is generative AI (GenAI), an algorithm capable of producing text, collages and other overviews of information and data gathered from multiple online sources. This offers challenges, such as students generating and submitting essays and reports from GenAI alone, but also opportunities, as a platform for further discussion and reflection as knowledge is uncovered and developed. Of particular interest is its capability in picking up information and data from multiple fields and presenting it in a digestible and interdisciplinary initial format, albeit it typically requiring further analysis, reflection, and modification. In response to this, a new AI-focused academic journal is proposed in this study, the drive being to enhance interdisciplinarity by bringing together postgraduate students and staff to research, explore, analyse, and critically reflect upon the challenges and opportunities that AI presents in their fields of study.

Keywords

Artificial intelligence; AI; interdisciplinarity; global and national challenge; higher education setting; authenticity.

Introduction

Society in the initial decades of the 21st century faces a multitude of authentic socioeconomic, cultural, and technological challenges, one of those being the inception of complex and deep machine learning (Baidoo-Anu and Owusu Ansah, 2023), in the form of what has been termed Artificial Intelligence or AI (Hu, 2022).

A prevalent form of AI at present is Generative Artificial Intelligence (GenAI). Once initiated, this is essentially a computer program that is able to



Image: <https://www.linkedin.com/posts/canterbury-christ-church-university>

function without further human intervention or supervision (Baidoo-Anu and Owusu Ansah, 2023) to produce a draft in text or another digital format (Abukmeil et al., 2021; Jovanović and Campbell, 2022) through the analysis of information and statistics (Hu, 2022; Jovanović and Campbell, 2022). GenAI can be further broken down into two sub-categories called Generative Adversarial Network (GAN) and Generative Pre-trained Transformer (GPT). GAN simultaneously creates and analyses data to determine its genuineness or authenticity and is used for voice and facial recognition (Hu, 2022) to, for example, unlock a smartphone. GPT uses vast amounts of publicly available data/information to create human-like text (Baidoo-Anu and Owusu Ansah, 2023) capable of live human-computer interactions such as chatbots or non-player characters (NPCs) in video games (Aydin and Karaarslan, 2022; Jovanović and Campbell, 2022; Pavlik, 2023).

At present, there is no commonly accepted definition of AI (Niemi et. al., 2018; Roschelle et. al., 2020; Neimi, 2021), but there is a consensus that any definition must encompass the notion of a computer,

machine, or artificial being's processing capabilities to be synonymous with those of a human (Stone et. al., 2016; Richter et. al., 2019; Roschelle et. al., 2020; UNESCO, 2021). AI is generally regarded as a computational machine that, through a process of data examination and inferencing, can act by itself (Roschelle et. al., 2020), often through the mimicking of how the human nervous system enables a person to learn, think and act (Stone et. al., 2016). In this sense, a computational machine can be classified as AI if it can complete a task that would usually require human levels of intelligence (Niemi et. al., 2018; Richter et. al., 2019), and reflects capabilities such as perception, representation, reasoning, learning, interaction and impact (Holland, 2020).

“AI is generally regarded as a computational machine that, through a process of data examination and inferencing, can act by itself...”

Literature

Education as a whole has been driven by its purpose, aspects of which concern authenticity and qualification, whereby students are provided with the necessary knowledge, skills and understandings to become active members of society (Biesta, 2010 & 2015). Higher education is a teleological practice stemming from the Greek word *telos*, meaning point or purpose of practice (Carr, 2003) and, in the 21st century, entwining authenticity into the curriculum has become, for many, the very point or purpose of studying at such a level (McVitty & Andrews, 2023). Higher education providers now often seek to prepare students to be part of the wider world (Biesta, 2017) through a blend relevant disciplinary knowledge and real-world professional practices (McVitty and Andres, 2023) to enhance graduate employability (Harvey, 2001; Brand et. al., 2013), employability itself now being a measurable value of higher education (Etzkowitz 2003; Perkmann and Walsh 2007; Veugelers and Del Rey 2015; O’Leary, 2017; Trinidad et. al., 2023).

“Education has been driven by its purpose, aspects of which concern authenticity and qualification, whereby students are provided with the necessary knowledge ... to become active members of society ...”

Applications, challenges, and opportunities for AI

The dominant ideology in education has compartmentalised knowledge into a myriad of separate disciplines (Ramadier, 2004), and this has led to knowledge in society being fragmented and confined by concepts of organisation, classification, and application (Clark and Wallace, 2015). It has been recognised over recent years that such a structure of knowledge is limiting humanity’s ability to process, understand, and tackle global socioeconomic and environmental occurrences (Clark and Wallace, 2015). Authors, such as Klein and Falk-Kresinski (2017) argue that interdisciplinarity and collaboration are key words for change in the 21st century, and that there is a growing consensus that contemporary societal, technological and environmental challenges require more interdisciplinary approaches (Marins et. al., 2019).

Interdisciplinarity in higher education came to prominence in the UK in the 1970s after its benefits were highlighted by the Organisation for Economic Co-operation and Development report (OECD, 1972). The term interdisciplinarity can be understood as an attempt to enhance knowledge or understanding of a concept beyond the confines of a specific subject, creating the possibility for deeper questioning of that concept (Squires, 1992). It is regarded as vital to the resolution of complex real-world issues that tend to traverse singular subject fields of study and academic disciplines (Hannon et. al., 2018; Nelson, 2019).

One such issue with societal impact is the technology that is leading towards AI. Authors (Niemi et. al., 2018; and Richter et. al., 2019) argue that AI is already affecting many aspects of modern daily life as the technology has made the leap from niche research facilities into everyday aspects of modern life and is influencing organisational and institutional interactions within wider society. In the retail industry alone, AI-based technologies are being leveraged to transform stock keeping, help provide personalised recommendations to enhance the customer experience, improve supply chain management and, through robots, optimise inventory management and improve order fulfilment (Niemi et. al., 2018).

In the education sector, Grasse et. al. (2023) indicate that AI could provide the answer to a growing call for individualised learning as reflected in research by



Image: Ask AI Image Generator, Powered by DALL-E 3

Cheng (2022) who states that AI-powered individualised learning could enhance student performance, partly through personalised feedback (Abdelghani et. al., 2023) but also through assisting teachers with individualised lesson content creation (Rachha and Seyam, 2023). Some AI tools are being developed into early warning systems (Krumm et. al., 2014) that can detect student behavior that has proven to correlate to certain outcomes (Roschelle et. al., 2020) and more recent AI systems have been able to appraise video footage of lessons to identify key moments that contribute positively to learning outcomes (Aung et al., 2018; Suresh et al., 2019).

Given that AI is starting to have a profound impact across contemporary society (Niemi et. al., 2018; Richter et. al., 2019), the challenge and opportunity it presents is interdisciplinary in nature (Klein and Falk-Kresinski, 2017; and Marins et. al., 2019). Therefore, understanding AI in its entirety requires the combining of knowledge of different disciplines, in order to advance in understanding (Annan-Diab and Molinari, 2017) and is thus a suitable concept for analysis through an interdisciplinary lens in an attempt to analyse, synthesise, and harmonise (Choi and Pak, 2006) the links between different fields of study (Lyll et. al., 2015).

Implications for epistemic knowledge

Given these potential impacts across multiple aspects of education and upon interdisciplinarity as a platform for progress, GenAI and other forms of AI can be expected to influence how learning takes place and how the knowledge, skills and

competencies developed are applied throughout society. This then signals fundamental implications for studies of learning and epistemic knowledge (Billingsley and Hazeldine, 2020; Billingsley et. al., 2023) and offers a series of significant challenges and opportunities across all forms of learning, education and development.

Methodology

The existing literature was suggesting that, aside from the challenges that AI could pose in higher education, it could also offer opportunities, one of which is using it as a platform for catalysing approaches to interdisciplinarity. One potential solution posed for pooling knowledge and views on this was through the creation of a journal to collate the various lines of thinking emerging in this new and evolving field. Therefore, in addition to relevant literature on AI issues, this study was complemented by posing the following question on interdisciplinarity to an existing online GenAI tool; Bing, by Microsoft (Mehdi, 2023):

'Why and how will our new journal, AI Times: Using the Lens of Artificial Intelligence to Explore and Encourage Interdisciplinarity in Higher Education, co-edited by two Masters students and where postgraduates write articles, advance our research environment and support our REF, provide opportunities for the student writers, cross-disciplinary and interdepartmental collaborations?'

Findings

Here is the response from the AI tool:

'It will advance your research environment and support your REF by showcasing the impact and relevance of your research across different disciplines and sectors. Interdisciplinary research is increasingly valued by funders, policymakers, and employers as a way to address complex and global challenges^{5,6}. By publishing articles that use the lens of artificial intelligence to explore and encourage interdisciplinarity, you will demonstrate your ability to produce innovative and cutting-edge research that transcends disciplinary boundaries and contributes to social and economic development^{5,6}.

It will provide opportunities for the student writers to develop their skills and knowledge in interdisciplinary research and communication.

Writing for an interdisciplinary audience requires clarity, creativity, and critical thinking, as well as the ability to synthesize and integrate information from multiple sources and perspectives^{6,7}. By writing articles for your journal, the student writers will enhance their transferable skills that are applicable to future learning and career opportunities^{7,8}. They will also gain exposure and recognition for their work and receive feedback and support from their peers and mentors.

It will foster cross-disciplinary and interdepartmental collaborations among students, staff, and external partners. By creating a platform for sharing and discussing interdisciplinary research, your journal will facilitate dialogue and exchange among researchers from different disciplines and backgrounds. This will enable them to learn from each other, identify common interests and goals, and form new partnerships and networks^{5,6}. Your journal will also attract and engage external stakeholders, such as industry, government, and civil society, who may be interested in collaborating with you or supporting your research^{5,6,7}.

Sources

5. Impact database: Results and submissions: REF 2021

6. Search REF Impact Case Studies - REF Case study search

7. Results - REF Case study search

8. Results - REF Case study search

Discussion

What is interesting to note, is that the AI tool touched on the concept of interdisciplinarity acting as an attempt to analyse, synthesise, and harmonise knowledge, as well as establishing the links between different sources and perspectives (Choi and Pak, 2006). The AI tool also implies that an interdisciplinary approach could have the potential to strengthen relations between two or more disciplines or branches of knowledge (Klein and Falk-Kresinski, 2017), provided they had a level of commonality in two or more areas of study (Marins et. al., 2019). The AI tool also touched on the notion that such an approach would combine the knowledge of different disciplines to advance understanding (Annan-Diab and Molinari, 2017), while supporting the notion that AI itself is a suitable concept for analysis through an interdisciplinary approach. In these ways, the AI's response mirrors parts of the theoretical understanding of interdisciplinarity within the current field of literature.

It is also worth noting that the AI tool explores the notion that the student writers will enhance their transferable skills that are applicable to future learning and career opportunities, and this complements ambitions in higher education to offer opportunities for students that mirror employment environments to gain skills, knowledge and competencies that are synonymous with relevant real-world professional practice (McVitty and Andrews, 2023). The AI tool also mentions such an opportunity could attract and engage external stakeholders, such as industry, government, and civil society, thereby interacting with the wider world (Biesta, 2017). The AI tool also states that such an opportunity would enable students to form new partnerships and networks, again capturing an essence of the wider world that students will enter after their studies and thereby enhance their employability (Harvey, 2001; Brand et. al., 2013; Billingsley and Fraser, 2018).

“What is interesting to note, is that the AI tool touched on the concept of interdisciplinarity acting as an attempt to analyse, synthesise, and harmonise knowledge as well as establishing the links between different sources and perspectives.”

However, there are also drawbacks in the AI response. For example, for the concept of REF (Research Excellence Framework), the AI tool produces a response that references databases but not actual academic articles. Some claims, such as interdisciplinary enhancing students' abilities to synthesize and integrate information from multiple sources and perspectives is not supported by a specific article and the AI tool provides instead a link to a REF database, and it does the same on enhancing transferable skills. This demonstrates the AI tool appropriating ideas from an initial conversation and using links inappropriately to try and add validity to its response. Furthermore, the AI-generated claims are rather lofty and idealistic but lack clarity on specific actions that may enable such ambitions to be realised, such as the claim that the journal will engage external stakeholders, while not providing any such potential evidence for that.

Conclusion

This study suggests that the proposed new interdisciplinary academic journal, The AI Times, can help support the provision of a good quality education for current students. It helps in its qualification function (Biesta, 2010) as it mirrors employment environments and responds to an ever-changing world (McVitty and Andrews, 2023). The journal offers students an opportunity to examine the authentic challenge of AI through the entwining of relevant disciplinary knowledge of real-world professional practice (McVitty and Andrews, 2023).

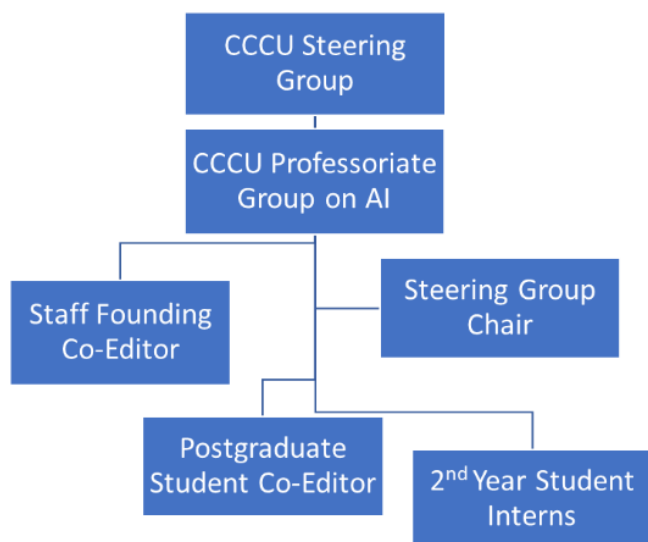
Recommendations

Based on this platform of research, the proposed structure and operation of The AI Times is as follows. Its editors, reviewers and writers have a mix of internal and external motivations (Murray, 2013), and operational activities are primarily carried out by two co-editors, a member of academic staff and a postgraduate student who undertakes the role as part of their Masters course. Activities could include advertising for contributions, supporting contributors, reviewing submissions for journal editions, contacting relevant departments, contacting companies regarding sponsorship and advertising, managing and supporting student interns, and coordinating with the Steering Group Chair.

It is proposed that the two editors report into a Steering Group Chair who is part of the University Professoriate, as illustrated in Figure 1, although this would need Professoriate approval:

Figure 1: The proposed management structure of The AI Times.

Those who contribute to the journal should benefit from doing so, and the journal aims to actively promote inclusivity by being open to contributors of all backgrounds.



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An AI future, or more of the same?

Introduction

According to Elon Musk we should be very scared of AI; it represents the greatest threat to humanity. Surely, the traditional news media inform us, we have to take this Bond-like villain seriously. He is after all, not only a tech entrepreneur – but a tech genius. Musk makes good press it is true.

The Exploitation Behind Amazon's Algorithm

But so does Jeff Bezos. And if you want to get to a certain essential truth masked by the moral panic of the AI appearance, Amazon's 'crowd worker' website Mechanical Turk (MTurk) is an interesting starting point. The original 'Mechanical Turk' was an eighteenth century chess automaton, designed by Wolfgang von Kempelen. It was a hoax. Inside the device capable of beating any human chess player was a human chess grand master. But with Amazon's website, behind the algorithm is exploited human labour.

“Workers are promised x amount of resource by tech platforms if they are able to complete tasks in a certain time frame. Failure to do so is failure to get paid and therefore failure to eat.”

Like a new form of the putting out system typical of early capitalism, homes especially in the Global South become the sites of data mining for large corporations. And in this relation, as Jones (2021) in his book *Work Without the Worker* writes, the wage has been replaced by a 'wager'. Workers are promised x amount of resource by tech platforms if they are able to complete tasks in a certain time frame. Failure to do so is failure to get paid and therefore failure to eat. It is difficult to imagine a situation in which the power relation between worker and 'employer' is more asymmetrical.



Image: Ask AI Image Generator, Powered by DALL-E 3

Conclusion

The immorality of such a relation is perhaps even more disturbing. The other morning, I turned on Radio 4 to hear rightly anxious parents worried about what type of offensive material their children might be able to access online. Surely the tech companies need to monitor and limit this content.

In reality, however, it is real living human labourers in the Global South monitoring and classifying some of the most appalling content, so parents in the Global North do not need to worry. Given that such outsourced labour occurs in the home, perhaps they are protecting us whilst exposing their own families to risk.

So, before we get carried away with Musk's sci-fi fantasy, let's grapple with this reality.

“...it is real living human labourers in the Global South monitoring and classifying some of the most appalling content, so parents in the Global North do not need to worry.”

Don't Get Spooked by Silly Mistakes: How GenAI Can Help You Write Better and How to Fix Mistakes

The Risks of Asking a Chatbot

Using a chatbot to write your essay or pitch your business comes with a risk. We all know we can strengthen a story with an amazing fact or terrifying statistic – and so it seems, the chatbots ‘know’ this too. The issue is that on many occasions, chatbots have embellished their creations with a phony fact or surprising statistic from a source that doesn’t exist. But as the disclaimer at the bottom of the Gemini screen explains, “*Gemini may display inaccurate info, including about people, so double-check its responses*”.

Generative AI chatbots don’t have the common sense of a person to know when truth matters in a statement. They emulate human responses by being trained on a vast subset of things humans have said, and because they are programmed to write in a persuasive way. We present them with questions and the internet as a resource to help create an answer. From the training phase the AI produces its guiding tensors, algebraic representations of the relations between words. You can think of these as like a fancy index to what people have said. During that mapping stage, all kinds of connections emerge, and patterns are found.

How an AI creates categories

Here’s an example, within the content that the bot traverses, it finds that there is a category of academic scientific papers and that the style of these is different relative to the style of a social media post. Perhaps when it first forms these two categories they are not called ‘scientific papers’ and ‘social media posts’, but by the time the training is complete it can distinguish a multitude of categories. E.g. interrogating Gemini for categories of text-types to contrast with scientific papers produced these responses:

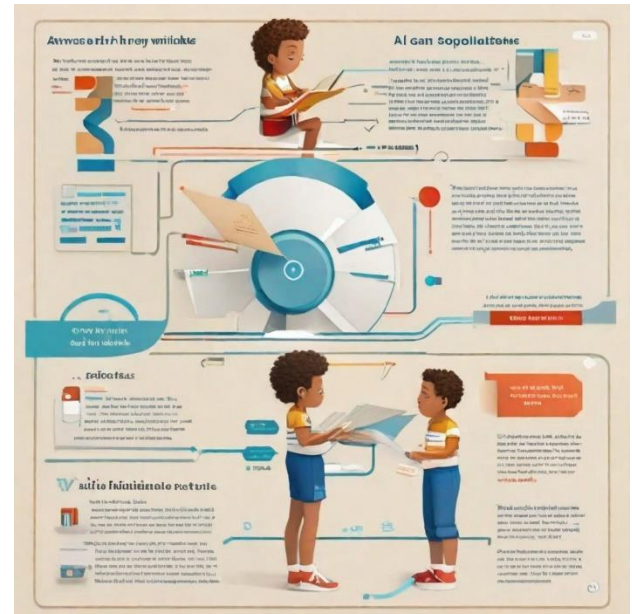


Image: Ask AI Image Generator, Powered by DALL-E 3

‘Creative Writing:

This is a broad category encompassing fictional stories, poems, plays, scripts, etc. It prioritizes emotional impact, imagination, and artistic expression over factual accuracy and objectivity, which are hallmarks of scientific papers.

Social Media Posts:

These are short, informal pieces of text shared on platforms like Twitter, Facebook, or Instagram. They focus on brevity, engagement, and personal experiences, often using slang, emojis, and conversational language.

Instruction Manuals:

These provide clear, step-by-step instructions on how to perform a task or assemble something. They prioritize clarity, conciseness, and visual aids over complex scientific concepts and terminology.

News Articles:

These report on current events in an objective and concise manner, aiming to inform the public. They use clear, concise language and may include quotes from experts, but don't delve into the scientific details behind the news.

Advertising Copy:

This persuasive text aims to convince readers to buy a product or service. It uses emotional language, vivid descriptions, and strong calls to action, all very different from the neutral and objective tone of scientific papers.'

By the point at which we presented the query (or prompt) it's no longer clear whether the categories are formed 'bottom up' by finding, analysing and sorting a trillion items of content according to patterns that emerge ... or whether the bot's answer has come about by accessing a smaller portfolio of texts that specify types of texts. After the event, it's hard to know, so we can put this kind of question to the chatbot to see what it says.

Analysing Existing Knowledge and Unsupervised Learning

AI uses both existing knowledge and its own ability to analyse vast amounts of data to categorize text. This combination allows AIs to be adaptable and handle new forms of text as they encounter them.

1. Analysing Existing Knowledge (Top-Down):

- Accessing large datasets of labelled text: AI models can be trained on massive amounts of data where each piece of text is already categorized (e.g., scientific paper, news article, social media post). This allows the AI to learn the characteristics associated with each category.
- Leveraging pre-defined rules and ontologies: These are sets of pre-defined categories and relationships between them. The AI can use these to identify patterns within the text that suggest a particular category.

2. Unsupervised Learning (Bottom-Up):

- Analysing large amounts of unlabelled text: AI can process massive amounts of uncategorized text data. By identifying statistical patterns in word usage, sentence structure, and other features, the AI can start to group similar texts together. These groupings might become the basis for new text categories.

- Refining categories through human feedback: The initial categories identified by the AI may need human input to be refined and ensure they are meaningful.

If this is an account of how GenAIs are working, to explain can we believe it? Well, we shouldn't believe that it's actually telling us how it went about the problem as though it remembers doing it, because that would require it to have a sense of itself and to feel ownership over its own decisions.

Does an AI have a sense of self?

We asked the AI and its answer is interesting but there may be better ways to edge closer to the truth: We could canvas experts and browse collections of publications. Focussing on the account from the AI, we might rightly be aware that the AI can't tell us how it went about the problem as though it remembers doing it. That would require it to have a sense of itself and to feel ownership over its own decisions.

One of the most important things to know about a GenAI is that its communication of identity and character is in reality – a sense of how we want to hear things. AI is not metacognitive or ethical by nature in the absence of models and rules to go with. It is always trying to go the way we push it. It has everything we've written and given it. This includes libraries of human knowledge and stories and volumes of poetry and literature, and expressions of shame and wonder and letters about crazy people, and even mythical genre and mathematical exactness and even lists of baby names and another list of baby names that all mean peace.

It's all visited and analysed by processes doing their job of figuring out what follows what in an utterance. Once trained an AI is equipped to mimic the way we write (or talk or blog or post etc). Further we can 'point' it to styles or content by the way we write a prompt. If you want to understand how a GenAI works, you can enter the question and specify the style or sources you want it to use and what you'll get could be an amalgamation of textbook answers (literally).

An answer ‘just’ for you

The text it writes, however, is generated on the fly, based also on how you ask the question. In some sense it is an answer that has never been written by anyone but is an amalgam of what everyone has said. And if no one has yet written anything about how they work, you will get a prediction about what they would say based on some other similar things people wrote. In other words when it casts its net into the world of content (the internet) if it catches some gems that exactly answer your question, it can work with those. But if your question takes it into spaces that are not already thick with content it will engage what it has learnt from other related areas and apply patterns it creates; the literature generally calls these hallucinations, we call them fantasies as they are it extrapolating from its reality.

Tips to reduce the impacts of AI’s mistakes

Firstly, you may get different answers and different advice depending on how you ask the question – because every question is a prompt that instructs the AI on where to look for content.

Secondly, an AI may state with authority that a Macaw can sing with different pitches because of its vocal cords – and be completely wrong. Why? Because this answer is logical if the AI finds an absence of information about Macaws and it copies across what it finds about human vocal cords online. It could also be that the texts the AI searches are inaccurate and claim vocal cords for birds. The more accurate picture is that “*Macaws, like many other birds, don’t possess vocal cords like humans do. Instead, they produce sound through a special organ called the syrinx. This allows them to control airflow very precisely, enabling them to create a wide range of pitches*” which is what the AI says now – after we might suppose feedback from expert users or more data with more detailed accurate descriptions of how birds sing to become available.

“...we shouldn’t believe that it’s telling us how it did go about the problem as though it remembers doing it, because that would require it to have a sense of itself and to feel ownership over its own decisions.”

Thirdly, (and our last tip for now) perhaps GenAI can do some of the checking with you. We’ve noticed that some of our recent requires have been met with a couple of answers showcasing the AI identifying alternative routes to go different routes to go. One is pasted below. Of course, such is the mystery and magic of working with an AI that we don’t know if this is a new standard practice hardwired into the bot by a new algorithmic code – or maybe it’s just that when it went to find a wordy answer to our wordy question, these were the words it found.

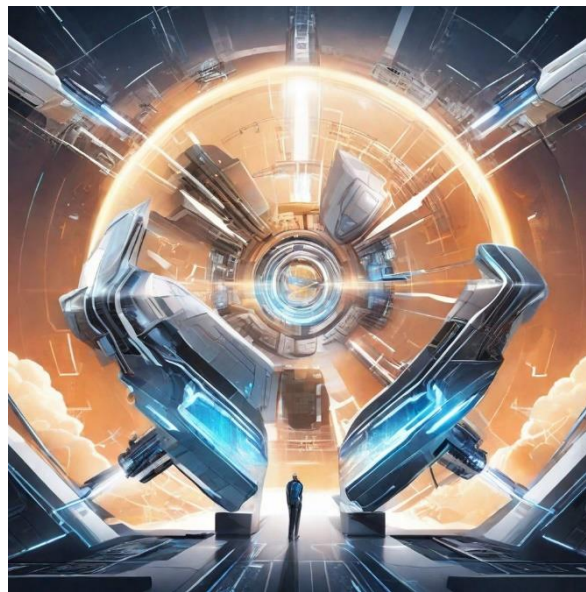


Image: Ask AI Image Generator, Powered by DALL-E 3

Our query: the start date of my project is 1 March 2024 and it runs 18 months, what’s the end date?

Gemini responds:

‘Adding 18 months to your project’s start date of March 1, 2024, will result in the end date. There are two ways to approach this:

Method 1: Counting Months

1. Start with March 1, 2024.
2. Add 18 months. Since a year has 12 months, 18 months equals 1 year and 6 months.
3. Move forward 1 year to March 1, 2025.
4. Move forward another 6 months to reach September.

Therefore, the end date of your project based on month counting is September 1, 2025.

Method 2: Using a Calendar

1. Find March 1, 2024, on a calendar.

2. *Flip through the calendar 18 months ahead, keeping track of the month you land on.*

Following either method will give you the same end date of September 1, 2025.'

And finally – we asked a GenAI how we should respond to mistakes that GenAI made: we instructed it to write an answer for a blog. Here is the AI's response:

'Don't Get Spooked by Silly Mistakes: Why GenAI is Still a Game Changer for Businesses

GenAI, the world of generative artificial intelligence, has exploded onto the scene. From crafting captivating marketing copy to generating unique product ideas, it promises a revolution in business creativity. But hold on a minute – haven't you heard about all those silly mistakes these AI models keep making?

Here's the truth: yes, GenAI can stumble. It might write a press release about a new line of peanut butter for dogs (whoops!) or generate website copy that reads like a robot trying to be your best friend (awkward!). But here's the key: these mistakes are like training wheels on a bike. They're a sign that the technology is still young, but they don't negate its immense potential.

The real power of GenAI lies in using it for what it excels at – sparking new ideas, generating vast amounts of creative content, and automating repetitive tasks.

The Key Is to Leverage This Power Intelligently

By employing innovative methods to check, refine, and curate the output, GenAI becomes an invaluable tool. Imagine a brainstorming session where AI throws out dozens of marketing campaign ideas – some wacky, some brilliant. Suddenly, your team has a springboard for real innovation.

The future of business isn't about robots replacing humans; it's about humans and AI working together. By understanding GenAI's strengths and weaknesses, businesses can unlock a new level of creative power, boosting efficiency and propelling them ahead of the competition. So, don't be scared by the occasional silly mistake. Embrace GenAI's potential and watch your business soar.'

Meet the Authors of This Article

Ted Selker

Ted is an established computer scientist, renowned for his innovative contributions to user interface technology. Ted's career spans roles at Xerox PARC, as an IBM Fellow, working in research labs, and professorships at MIT, Stanford and Carnegie Mellon. His work in AI and UX is found in his writings and product contributions but also earned him 67 US patents. In a typical online conversation, Ted solves your queries in a refreshingly innovative way while fixing a gadget you can't quite see just below the camera.

Berry Billingsley

Berry is a professor and journalist specializing in science and science education. Berry's training was Physics at Oxford; she leads the LASAR Research Centre, exploring questions that bridge science and religion. Berry's research develops the construct, epistemic insight which is designed to inspire and support curriculum writers and learners to discover more creative, wise, and compassionate ways of interacting with knowledge. Most people who engage Berry in conversation find themselves exploring the shapes and sizes of water droplets no more than five minutes later.

Want to be in the next issue?

Here at BQIL, we are always looking for students and faculty who are willing to answer to the Big Questions of the 21st century. Each issue will cover a different key challenge and opportunity we face. Why not join in and write for us? If interested, please contact Found Co-Editor Sam Clarke at sam.clarke@canterbury.ac.uk to be added to our authors mailing list.



Image: This is what AI looks like, according to AI
<https://www.cnn.com/2018/11/08/photo-what-ai-looks-like-according-to-imb-ai.html>

Will AI Mean the End of Work as We Know it?

Elon Musk's Warning of a Possible Future

Whilst I sit in A&E waiting for my mother to be seen reflecting on Elon Musk's dystopian view that future humans will have choice whether they would like to work or not as the machines will have the capability to do all the work for us. I was wondering how true or realistic this would be possible with the events of my day. I am a control and instrumentation engineer, over thirty years ago I started my engineering career in developing AI systems for industry.

I must admit that many areas of AI that my colleagues and I have been researching and developing have already become mainstream in our lives. We are already experiencing the benefits, or lack thereof, such as when a computer simply responds with "No." Nevertheless, I can't help but wonder how different my daily life would be in Elon's automated dystopian future.

Yes, it is quite possible that robotic care assistant would alert me to fact my mother has had fall and needs to be taken to A&E. Yes, it is quite likely we would be greeted by automated receptionist, but I am not sure it would handle the error in my mother's file that needed resolving and cross checking - it took three human operatives to resolve that issue.

Can AI Ever Really Replace a Human?

In the future the process would be more streamlined and efficient from reception to diagnosis. However, an automated doctor in case of an examination of patient who has fallen, I am not so sure, as the nature of the fall, location of the fall, examination and level of sensitivity required, also variation of human tissue, shape, size and human physiology etc. I still think a human doctor will be required to exam a patient, but quite probably work with AI diagnostic tool.

However, transporting of my mother in hospital in a wheelchair akin to a supermarket trolley with uneven wear of the wheels and bearings, was an interesting challenge through an old winding hospital corridor, with non-automated doors. As too was the careful undressing, and dressing of my mother for X-ray. All of which required my support and actions that I am not sure a humanoid robot would have been able to support with the right amount empathy cognitive and physical agility.



Image: Ask AI Image Generator, Powered by DALL-E 3

Therefore, for an AI robotic humanoid to replicate my role, it would require a higher cognitive ability to recognise minute changes physically, physiology and cognitively in my mother's physical and mental presence. It required from myself depth of cognitive thinking, observations in real-time, also drawing from depth of knowledge of documented and non-documented medical physical, physiology and cognitive history.

Conclusion

From an instrumentation perspective the biggest question how can these minute physiology, physical and cognitive changes be digitally measured. For an AI robot to be autonomous carer in this case it would require multiple sensors to provide information for the AI computer-to-computer appropriate response and action. Therefore, it is not a question of AI being able to generate the appropriate response or action, it is more a question of can everything be sensed and measured for the AI to analyse and generate an appropriate response.

At the moment, not everything is measurable and not everything can be measured accurately. Therefore, for Elon dystopian future is a long, long way off from being possible, as currently not everything can be sensed and measured to support the creation of a fully AI automated world

Book Review: AI in Learning: Designing the Future

- by Niemi, Pe and Lu (2023)

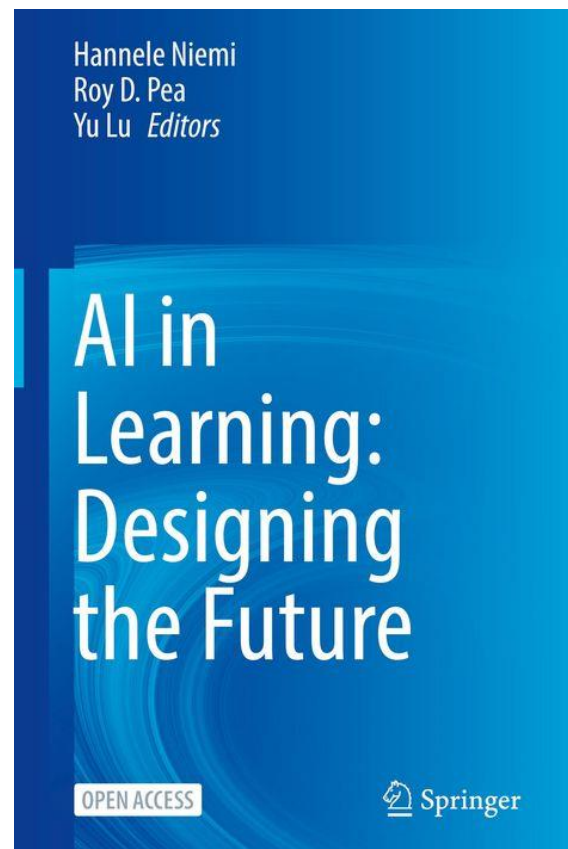
'A.I. in Learning: Designing the Future' by Neimi is a groundbreaking book that delves into the intersection of artificial intelligence and education, presenting a compelling vision of how AI can revolutionise the way we learn and teach in the future.

Neimi begins by providing a comprehensive overview of the current state of education and the challenges it faces, from outdated teaching methods to unequal access to quality education. She then introduces the concept of AI in learning, explaining how artificial intelligence technologies can be leveraged to personalise learning experiences, enhance teaching effectiveness, and improve educational outcomes for students of all ages.

One of the key strengths of Neimi's book is her ability to explain complex AI concepts in a clear and accessible manner, making the content easily digestible for readers with varying levels of technical expertise. Through real-world examples and case studies, she illustrates how AI-powered tools such as adaptive learning systems, intelligent tutoring systems, and educational chatbots are already transforming the education landscape, offering personalised learning experiences that cater to individual needs and preferences.

Neimi also addresses the ethical implications of AI in education, raising important questions about data privacy, algorithmic bias, and the role of human teachers in an increasingly automated learning environment. By exploring these issues in depth, she encourages readers to think critically about the potential risks and benefits of integrating AI into educational settings, emphasising the importance of responsible AI design and implementation.

Throughout the book, Neimi emphasises the need for collaboration between educators, technologists, policymakers, and other stakeholders to ensure that AI is deployed in ways that benefit learners and support the goals of education. She advocates for a human-centric approach to AI in learning, where technology is used to augment and enhance the work of teachers rather than replace them, fostering a more personalised and inclusive educational experience for all.



Available at:

<https://link.springer.com/book/10.1007/978-3-031-09687-7>

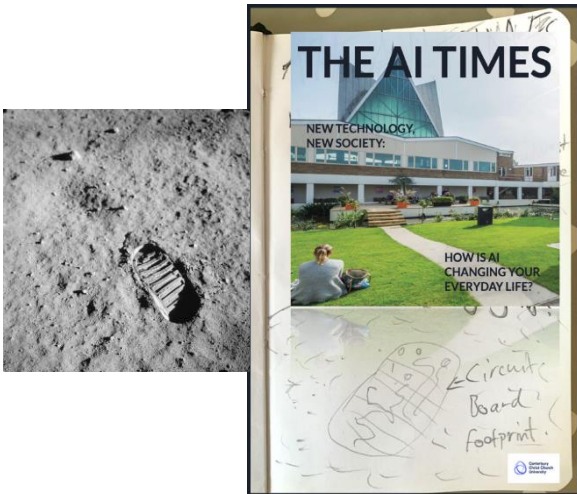
In the final chapters of the book, Neimi presents a roadmap for the future of AI in education, outlining key areas for research, development, and implementation. She envisions a world where AI-powered tools are seamlessly integrated into the learning process, helping students to reach their full potential and preparing them for success in the digital age.

Overall, "A.I. in Learning: Designing the Future" is a thought-provoking and insightful exploration of the transformative power of artificial intelligence in education. Neimi's passion for both technology and learning shines through in every page, inspiring readers to imagine a future where AI serves as a powerful ally in the pursuit of knowledge and enlightenment. This book is a must-read for anyone interested in the intersection of AI and education, offering a compelling vision of what the future of learning could look like.

The AI-Augmented Cover Image of Issue 1

The Task

I was given the task to alter an image using AI, and as someone who takes interest in innovation, I used this opportunity to experiment, seeing how image making is evolving. The final conceptual idea drew inspiration from a series of photographs from the first moon landing, and more specifically the idea of the footprint signifying AI as uncharted territory in this brief.

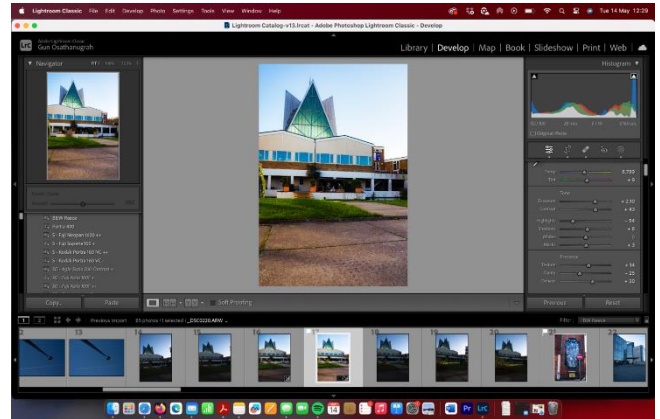


The real-life image, (photograph) was taken in January 2024, of one of the Universities iconic buildings. The RAW file was then colour corrected in Adobe Lightroom before any AI modifications were added and changed.

Using AI for the First Time

When searching for AI image making software, I researched Midjourney and Bing's, Copilot. Bing Designer uses DALL-E 3, which is built natively on ChatGPT. However, I didn't like their online process, with Bing's prompt still buffering in the search bar now... As I commenced editing in Adobe's software, I decided to move the photo into Adobe Photoshop Beta where I then created the following prompted layered images:

- Footsteps
- Sky replacement
- Drone
- Robot cleaner
- Robot poster
- Additional Tree
- Additional bushes and remove nativity scene, (as the image was taken in winter)
- Clean up window reflections



My Findings from Working with the GenAI tool:

The AI prompting skillset is a new tool for artists to learn, having to master the correct language model which this early AI understands. To me the prompt words seemed like a stab in the dark, and so with more research I may have been able to create a more realistic skyline, drone and robot.

During the 10 second wait time while the prompt is processing, I felt my brain become less engaged with the task. I realised I didn't enjoy giving the computer so much creative control, and if I could draw, I would prefer my imagination and hand to do the work, (even if it may take longer to create).

The Artist:

Reece Gibbins is a UK-based freelance photographer and filmmaker. Starting in 2013 by capturing London's streets as a hobby, he honed his skills in reacting to spontaneous moments and valuing people's stories. This passion evolved into collaborations with various art galleries, producing photo and video content for their online platforms. Reece later became a freelance creative director at one of these galleries. Additionally, he worked with Naomi Campbell on multiple projects over two years, creating video content for her social media and an upcoming documentary.

Professional contact details

<https://www.mrreece.co/>

