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CAMBRIDGE GENERATIVE AI IN EDUCATION CONFERENCE 2024

Human-machine collaboration and the expansion of the dialogic space: Addressing the challenges of generative AI integration in education

Cambridge Generative AI in Education Conference 2024:
Human-machine collaboration and the expansion of the dialogic space:
Adressing the challenges of generative AI integration in education

Cambridge, 16 – 17th October
Hilton Cambridge City Centre
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DEFI, the Digital Education Futures Initiative, Hughes Hall, University of Cambridge
Glenlead Centre, London
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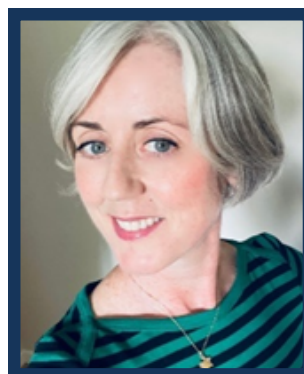Glenlead Centre,
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KEYNOTE SPEAKERS

Prof Mairéad Pratschke

Title: The new hybrid

Abstract:

A recent report (Hirabayashi et al, August 2024) on the use of generative AI by undergraduate students shows that it has been widely adopted. Two years after the release of ChatGPT-3.5, the knowledge gap is growing wider by the day, as students adopt and adapt to this fast-moving technology, while educators operate within a system resistant to change. The growing gap has been dramatically illustrated in the terrain of assessment but academic integrity is only the tip of this iceberg. From research to teaching, from learning design to assessment, academic practice across all stages and in all disciplines is set to change as a result of the interaction between humans and AI. This has tremendous implications for how, where and what we teach. It is already clear that it will change the role of the educator, from being the sole source of authority to one of multiple presences in our learning community. But how do we design education for a world in which we construct, define and disseminate knowledge in collaboration with machine intelligence? In this keynote, Mairéad will introduce the concept of the new hybrid, a social, generative, constructivist and human-centred model of education that is defined by collaboration with AI.

Biography:

Mairéad is Chair in Digital Education in the School of Arts, Languages and Cultures at the University of Manchester. She is a Research Fellow at the USA's National AI Institute for Adult Education and Online Learning (AI-ALOE) and a member of the Advisory Board. Mairéad holds a Ph.D. in History from McMaster University in Canada and an M.A. in European Studies from K.U.Leuven in Belgium. Irish born and raised in Canada, she has worked internationally in digital education in Canada, the USA, the UK, Belgium, Spain and Ireland, and across sectors in higher education, and professional and executive education, and lifelong learning. Her first book, Visions of Ireland (Peter Lang, 2015), is on the representation of minority identity in Irish-language film and the use of modern media as a vehicle for language revival. She joined the University of Manchester in 2022 as SALC Chair in Digital Education, where she led the Faculty of Humanities working group on AI and Assessment in 2023 and currently sits on University's central AI Strategy committee. She has been invited to deliver keynote talks on generative AI in education in Canada, Ireland, the Netherlands, Portugal, Spain, Singapore, South Africa, the USA and the UK. Her book on Generative AI and Education is forthcoming in October 2024.

KEYNOTE SPEAKERS

Prof Dr Wayne Holmes

Title: Artificial Intelligence and Education. A Critical Studies Perspective
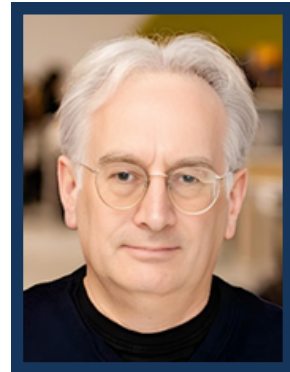
Abstract:

Artificial Intelligence (AI) is frequently hailed as a 'solution' to many of education's core problems (e.g., OECD, 2021) – problems such as the lack of qualified educators, student underachievement, and better preparing learners for 21st century careers. However, such claims tend to be aspirational rather than evidence-based (Miao & Holmes, 2021), and overly simplistic, forgetting issues such as agency, pedagogy, surveillance, efficacy, and ethics (Holmes et al., 2021; Holmes et al., 2022; Holmes & Porayska-Pomsta, 2022). In fact, teaching and learning with AI (AIED) all too often aims to replace educator roles rather than empower educators; while teaching and learning about AI (AI Literacy) almost always focuses on the technological dimension of AI to the exclusion of the human dimension (its ethical, human rights, and social justice implications). Accordingly, this presentation will explore Artificial Intelligence and education (AI&ED) from a critical studies and human rights perspective. It will identify and address many of the key myths, it will explore the untruths of generative AI, and will pose more questions about AI and education than it answers.

Biography:

Wayne Holmes (PhD, University of Oxford) is Professor of Critical Studies of Artificial Intelligence and Education at University College London (UK). His research takes a critical studies perspective to teaching and learning with and about Artificial Intelligence (AI&ED), and their ethical, human rights, and social justice implications. Wayne is leading the Council of Europe's AI&ED expert group, for which he co-wrote 'AI and Education. A Critical View through the Lens of Human Rights, Democracy, and the Rule of Law', and which is developing legislation to protect the human rights of students and teachers engaging with AI-enabled systems. He is also Consultant for UNESCO, for which he co-wrote 'AI and Education: Guidance for Policy-makers' and 'Guidance for Generative AI in Education and Research'; a Senior Researcher in AI&ED for the International Research Centre on Artificial Intelligence under the auspices of UNESCO; and an AI&ED expert for the United Nations and the EU JRC. Wayne has also co-written 'Artificial Intelligence in Education. Promise and Implications for Teaching and Learning', 'State of the Art and Practice in AI in Education', and 'The Ethics of AI in Education. Practices, Challenges and Debates'. He has given invited keynotes about AI&ED in countries around the world.

KEYNOTE SPEAKERS

Professeur Jean-Gabriel Ganascia
Sorbonne Université - LIP6

Title: The braided structure of time in AI and information technologies

Abstract:

With reference to the evolution of information technologies, i.e. the history of cybernetics, machine translation, AI, computer networks, etc., we will show that innovation in digital technologies is surprising because its progress usually defies prediction and therefore seems chaotic. The curve of its actual development often goes back into the past, while nobody cares. Paths that were taken and then abandoned in the course of basic research suddenly reappear and are successful as has many times been the case with neural networks. Some strands of change are divided and subdivided to such an extent that the thread of time seems to be forked and twisted rather than simply linear, as the classical idea of progress would seem to imply because of its cumulative nature. The structure of time, then, is not really ordered like shelf space, but somewhat tangled. In other words, at any given point in time, there are several alternatives, some of which the most brilliant minds are working on, while others seem to be in retreat, hidden from the general public. Then, from time to time, what seemed hidden reappears, and what has gradually come into view disappears. Time, then, is a tangled strand, a braid of hair, the strands of which scatter and even move out of sight before reappearing in a new light and disappearing again. In this sense, we can speak of the time of information technologies in the contemporary modernity as a braided time.

Biography:

Engineer and philosopher by training, Jean-Gabriel Ganascia is currently Professor Emeritus of Computer Science at the Sorbonne University, a EurAI Fellow, an honorary member of the Institut Universitaire de France and a member of LIP6 (Laboratory of Computer Science of the Sorbonne University). His current research activities focus on artificial intelligence, computational ethics, computer ethics and digital humanities. He has published more than 500 papers in conference proceedings, scientific journals and books. He is also the author of a dozen books for the general public, the latest of which, entitled "AI Explained to Humans", has been published by Éditions du Seuil in 2024.
Jean-Gabriel Ganascia is currently Chairman of the Ethics Committee of France Travail that is the French National Employment Agency, of AFAS ("Association Française pour l'Avancement des Sciences"), that is one of the oldest French scientific societies and of the Steering Committee of the CHEC (Cycle des Hautes Études de la Culture). He was also President of the CNRS Ethics Committee (COMETS) between 2016 and 2021.

KEYNOTE SPEAKERS

Prof Dr Rupert Wegerif
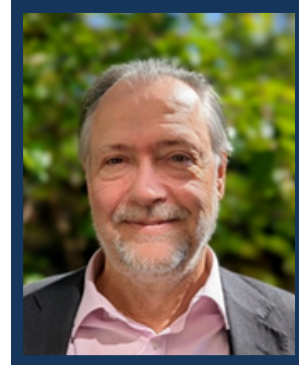
Title: Generative AI and expanding dialogic space

Abstract:

Education has always been bound up with technology. Advances in technology mean that we need to re-think not only how we conduct education but also what education is for. If the pedagogical affordances of generative AI challenge many of the current goals of education this might be because these current goals are often too narrowly tied to the limits of print literacy. I argue, with examples, that we can use this technological advent to return to an education that foregrounds a more fundamental goal of education which is teaching for dialogue. Dialogues supported by AI can help teach students how to think better in every area and help induct them into participation in the long-term global dialogue.

Biography

Rupert Wegerif is a professor in the Faculty of Education at the University of Cambridge and academic director of the Digital Education Futures Initiative at Hughes Hall, Cambridge. He is the author of several influential books and articles in the area of educational theory, educational psychology and education with technology. His most recent book, written with Louis Major 'The Theory of Educational Technology: A Dialogic Foundation for Design' (Routledge, 2024). His research focuses on the theory and practice of education with technology in the digital age, especially technology supported education for dialogue. He offers a new approach to education in the Internet Age: education as expanding dialogic space.

Panel discussion AI in Education: Friend or Foe?

Prof Jenny Gibson

Biography:

Prof. Jenny Gibson is Professor of Neurodiversity and Developmental Psychology at the Faculty of Education, University of Cambridge. Jenny is a co-director of CHIA, the Centre for Human-Inspired AI, and her research interests include the use of technology to support inclusion and access to education for those with communication difficulties. Jenny is also researching young children's attitudes and relationships with non-human conversational agents such as chatbot enabled toys.

Prof. Li Yuan

Biography:

Professor Li Yuan is the director of Centre for Connective Intelligence in Education at the College of Education for the Future at Beijing Normal University and she is also a senior researcher in AI Innovate Lab at the Digital Education Future Initiative (DEFI) at University of Cambridge. For the last 20 years, Professor Yuan has worked in the UK, including Cetis (a National Innovation Support Centre for UK Higher Education), University of Cambridge and University of Belfast, researching and investigating the impact of technology in education and support innovative use of digital technology in teaching and learning. She has led and involved in a number of large technology enhanced learning and educational future projects in Europe, including,"TEL-Map", "LACE" and "RAGE" etc. Her main research interests including: AI literacy for teachers; AI support dialogic education and collective intelligence; Learning Analytics and Educational Assessment and MOOCs & Online/Blended Learning.

Panel discussion AI in Education: Friend or Foe?

Kellie Mote

Biography:

With over 25 years' experience in the field of assistive and accessible technology in education, Kellie works in the spaces where people and technology meet, with a strong focus on the strategic deployment of technology to liberate and empower disabled people. She facilitates large solution-focused professional communities, and is co-chair of Accessible Digital Futures, a Jisc-Glenlead project which explores unlocking the potential for accessible digital and AI technologies in higher education. Published research includes Technology acceptance and trust: Overlooked considerations in young people's use of digital mental health interventions. Jisc is the UK digital, data and technology agency focused on tertiary education, research and innovation. It is a not-for-profit organisation and believes education and research improves lives and that technology improves education and research.

Dr. Joleen Liang

Biography:

Dr. Joleen Liang, co-founder of Squirrel Ai Learning and a distinguished academic with a Ph.D. in Intelligent Science and Systems has significantly contributed to the fields of AI and adaptive learning. As a visiting professor at The Research Institute for Innovation and Technology in Education (UNIR iTED), she focuses on personalized learning and the application of AI in education. Dr. Liang has shared stages at prestigious global forums like the World Summit AI with luminaries such as Yoshua Bengio and has been featured at international summits and by media outlets like Bloomberg. Her research spans AI adaptive learning, intelligent education systems, Large Adaptive Model (Squirrel Ai's LM) and multimodal learning analytics, leading to influential publications in esteemed journals and conferences, including publications in esteemed journals like IEEE Transactions, continue to shape the landscape of intelligent education. Under her leadership, Squirrel Ai has revolutionized smart education, impacting over 20 million users by integrating AI into learning systems and hardware across thousands of schools.

Panel discussion AI in Education: Friend or Foe?

Dr Ann Kristin Glenster

Biography:

Ann Kristin is the Executive Director of the Glenlead Centre, a consortium of independent researchers who aim to bridge the gap between high-quality research and public policy. Ann Kristin is a Technology and Human Rights Fellow at the Carr Centre for Human Rights Policy at the Harvard Kennedy School; a Senior Policy Advisor on Technology Governance and Law at the Minderoo Centre for Technology and Democracy, and an affiliate of the Centre for Intellectual Property and Information Law (CIPIL) at the University of Cambridge. She has taught law at the University of Oxford, University of Cambridge, London School of Economics (LSE), and Brown University. She has been a Teaching Fellow at Harvard College where she taught moral philosophy for Professor Michael Sandel. She holds a PhD in Law from the University of Cambridge with a dissertation entitled The Commodification of Personal Data. She has published on AI, intellectual, property, and personal data with Edward Elgar and held a workshop on deceptive design for legislators, regulators and civil society in Washington D.C. as part of the Nobel Prize Summit 2023.

Vahid Aryadoust
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Using GenAI to Develop Adaptive Oral Communication Assessment Systems

Summary:

With the rise of large language models (LLMs), generative artificial intelligence (GenAI) offers unprecedented opportunities to enhance the design and implementation of oral communication assessments. In this study, I present two ongoing projects focused on developing formative oral interaction assessments using GenAI. The first project explores the potential of integrating GenAI into these assessments, particularly focusing on text-generation text-to-speech systems. I highlight the linguistic and semantic features of GenAI-generated content compared to established commercialized listening assessments. The research aims to identify areas where GenAI can drive innovation, as well as the challenges that may emerge. The study emphasizes that while GenAI holds promise for diversifying and streamlining assessment creation, it is essential to balance these benefits with the foundational principle of authenticity. Building on this foundation, the second project involves the development of an AI dialogue system (or spoken dialogue system, SDS) to assess oral interaction for academic purposes. SDSs have found applications across various fields, such as customer service, healthcare, education, smart homes, entertainment, and accessibility. This ongoing research focuses on creating an interactive formative AI dialogue system for academic speaking purposes, utilizing OpenAI's LLM optimized for dialogue. The speaking assessment system offers a range of tasks, including monologues and dialogues, with significant adaptability to provide individualized feedback on pronunciation, vocabulary, grammar, and coherence. The study demonstrates the LLM's ability to generate natural, wide-ranging conversations, which can address the limitations of current SDSs, which are often topic-specific. The research provides preliminary evidence supporting the system's capability to offer tailored feedback, thereby enhancing the relevance and effectiveness of oral communication assessments. In conclusion, this study illustrates how integrating GenAI across different facets of language assessment—from listening to interactive communication—can enhance the design and implementation of formative assessments. The findings suggest that GenAI has the potential to improve the efficiency and adaptability of these assessments. As we continue to explore the possibilities of GenAI in education, this study serves as a step toward more innovative and effective formative assessment practices.

Key words:

AI dialogue system listening assessment, generative artificial intelligence, speaking assessment

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Fleeced and Forgotten: The Marginalisation of International Students in Global Higher Education GenAI Academic Integrity Policies

Summary

The proliferation of Generative Artificial Intelligence (GenAI) introduces additional complexity to the tapestry of academic integrity preservation in higher education. In response, higher education institutions (HEIs) have been compelled to develop and implement new academic integrity policies, often under pressure to address the immediate challenges to assessment validity posed by GenAI tools like Open AI's ChatGPT. Current research attests to a fragmented policy landscape that speaks to a nascent and inconsistent approach to GenAI governance in HE at present, which raises concerns about the potential for inequitable treatment of students across different institutions and the subsequent impact on educational outcomes. Analogously, the alarm has already been sounded by scholars who warn of the bias of GenAI text classifier tools, such as Turnitin, towards the work of students who use English as an additional language. To that end, in this presentation the novel findings of a recent study which critically examines such GenAI academic integrity policies within tertiary education are presented, exploring current provision for the bespoke needs of international students. Owing to the complexity at hand, a two-staged methodological approach was devised. Stage 1 employed qualitative document analysis of publicly available institutional web-based sources, collected through comprehensive internet searches using relevant keywords. The corpus underwent analysis using Sketch Engine to code and categorise policy contents. The subsequent stage built on these findings by conducting a SWOT analysis on the subset of policies with international student provisions. A total of 131 GenAI academic integrity policies were analysed from HEIs from 11 countries. Findings highlight a significant underrepresentation of international students in policy considerations, despite their notable longstanding economic impact. Only 11.45% of the policies were found to make explicit reference to them, with a concerning 3.05% of the total corpus found to directly address the challenges posed by GenAI technologies for such learners. The SWOT analysis particularly noted the ambiguous nature of GenAI tool usage and highlighted an overarching lack of training and support for international students in this regard. These findings cast a stark light on the enduring conflict between the financial exploitation of international students and the ethical responsibilities of educational institutions. As we stand on the precipice of a new era in HE, driven by the rise of GenAI, it is no longer sufficient for institutions to merely acknowledge these issues—they must substantiate on policy guidance in a socially justice way. The concluding remarks of the presentation not only advocate for the immediate integration of diverse international student perspectives into policy frameworks but also propose a critical re-evaluation of how academic integrity policies can better serve the needs of a diverse, international student body.

Key words:

Generative Artificial Intelligence (GenAI); International Students; Academic IntegrityPolicy Analysis; Higher Education; Educational Equity

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AI as a component of an action research model of learning

Summary:

We consider a learning model of research, invention, discovery, inquiry, 'learning-by-doing', Circles and Olympiads, special maths classes as opposed to the 'drill-and-practice', 'industrial' model of the 19th century. Mathematics courses are organised in cycles of problems that the learner 'does-not-know-how-to-solve' – lemmas, ideas for productive examples and 'counterexamples'.
 Now this model can be proposed for mass schooling.
 Why it is realistic?
· 	Using calculators, CAS, dynamic geometry, functional programming languages, and AI can save time and energy of the pupil and teacher, raise and keep their motivation; a good example is the Kangaroo competition.
Why is it needed?
· 	The ability and attitude to solve unexpected problems is required for many jobs and social roles in the Digital Society.
· 	The motivation of schoolchildren and families for mathematics continues to be low.

An efficient arrangement is:
· 	1 main teacher for the class of 20 – 30 K-12 pupils. We reserve term 'learners' for them.
· 	University undergraduates or graduates (or even high-school students as in Bob Moses' Algebra Project, or STEM Ambassadors) - we shall call them 'students' as assistants, 1 per 5-7 pupils
· 	A learner's written work, as a rule, is discussed orally by them with a student; group work etc. are used as well.
 The model assumes direct supervision by a human teacher, assisted by a student, of every pupil.
 Where is AI here?
We use the metaphor of human personality expanded by the information technologies of speaking, writing, reading, calculating, literature search of the past and digital technologies and AI now. Every human has their bio and digital parts.
 Here are examples
· 	In a Language/Action model the teacher might design "mathematising situations" previously encountered or "not-known-how-to-solve" for the learner without scrutiny
· 	Subject to learner control the digital part of the teacher might monitor the learner with cameras and microphones and keyboard recording in the classroom and at home. The monitoring gives the teacher predictions and indication of special cases. Learners, teachers and parents/carers are aware at all times of data collected about them and of access to it. If it is persisted it will be aggregated and anonymised. Data collection is happening now and we should develop more morals and habits on this.
· 	The digital part of the student reacts to the learner's work in dialogue: asking questions and proposing ideas. These will not be 100% relevant, wise, or 'correct'. Sometimes it is enough to say: "interesting". Of course, more meaningful interaction can be more productive. An interesting situation might even arise when an AI hint is misleading. This tool can save students' time to use for critical cases.
Google's Photomath can be a part of our model, as well as pupils learning LaTeX (in a WISIWYG environment), oral input.
Looking further ahead we reconsider the general case. In the paradigm of AGI: Human – AI – Reality we use Reality to be Mathematical Reality and can combine logic with intuition, like in the recent achievements (IMO) of AlphaProof and AlphaGeometry teams.

Keywords:

Language/Action Theory, Mathematising, Maths Circles, Learning by doing, AI-dialog

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The Diminishing Place of Individuals- Examining the Emergent Future Built by Prediction Algorithms in the Realm of Education

Summary:

Educational technology has long been characterised by cycles of hype and disappointment. This paper critically examines whether artificial intelligence (AI) and big data represent a truly disruptive force in education – one that does not merely promise to solve existing problems but fundamentally alters the nature of those problems and the system itself. This study unpacks the complex ways AI could redefine power dynamics and decision-making in education by applying concepts such as the 'sociotechnical imaginary' and the 'looping of social systems'. The research explores how AI-driven approaches, particularly those supporting prediction and anticipatory governance, might reshape the landscape of human agency and control within educational processes. Through a comprehensive analysis of literature and theoretical frameworks, the study investigates the unique characteristics of AI and big data that differentiate them from previous hype cycles in educational technology. The paper introduces David Beer's concept of 'data coils' and the 'looping of social systems' to discuss the complexities that prediction algorithms introduce to social systems and social research. It argues that these loops may shape educational outcomes and fundamentally alter the nature of the problems education seeks to address. Key findings indicate that as we progressively embrace data-driven and algorithmic approaches to governance in education, we may be inadvertently diminishing the role of human agency at all levels of the system:
1. Students are increasingly viewed through the lens of quantifiable data, with AI systems potentially being used to predict and shape their educational trajectories. This raises questions about the impact on individual agency and the nature of learning itself.
2. Educators' roles are redefined as AI systems are increasingly used in teaching and assessment processes. This shift questions the value of professional expertise and teachers' autonomy within the educational system.
3. Policymakers, while initially empowered by data-driven decision-making tools, might face challenges in maintaining agency as they grapple with increasingly complex and opaque AI systems.
This raises concerns about the nature of educational governance in an AI-driven landscape. This study contributes to the field by offering a nuanced perspective that goes beyond questioning whether AI will live up to its hype. Instead, it suggests that as we progressively embrace data-driven and algorithmic approaches to education governance, we may inadvertently diminish the role of human agency at all system levels. The paper concludes by emphasising the need for a critical assessment of whether this shift towards prediction and anticipation governance helps us achieve the desired educational outcomes or alters the course altogether. It calls for increased attention to the consequences of AI prediction in social systems, using education as a case study. The paper suggests future research directions, including exploring regulatory frameworks to preserve human agency in AI-driven educational environments and developing strategies to enhance AI literacy among educators and policymakers.

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The Social Meaning of Generative AI

Summary:

Sociology has a long tradition of exploring the relationship between technology and society. From Marx to Latour, it has been recognized that technological change deeply impacts society, while society simultaneously shapes the direction of technological development. This reciprocal relationship points out how social structures are both shaped by and shape technological advancements. However, despite this rich tradition, one critical issue remains theoretically underdeveloped: the problem of meaning. The question of how meaning is constructed in relation to technological developments like generative AI has not been fully addressed. In this work, we aim to bridge this gap by synthesizing three key sociological traditions—sociological phenomenology, social systems theory, and actor-network theory. Central to our approach is the concept of autopoiesis, which we posit as a crucial framework for understanding meaning as a dynamic, heterarchical construct. Meaning emerges from the interaction of individual, societal, and material forces in an eco-systemic space of mutual "irritations" between these actors. With the advent of generative AI, particularly exemplified by technologies like ChatGPT, the construction of meaning takes on new importance. This paper proposes a novel theoretical framework to conceptualize social meaning in the context of generative AI, focusing on the co-creation of meaning through interactions among human actors, societal structures, and AI systems. Our goal is to contribute to a deeper sociological understanding of how meaning is produced and negotiated in the age of intelligent technologies.

Key words:

Social meaning, Phenomenology, System theory, Actor network theory, genAI

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The Dual Nature of Generative AI: Two Case Studies of Student Agency and Coding Assignments in Higher Education

Summary:

This presentation highlights the case of two undergraduate students (Student A and Student B) with different levels of agency over their learning process engaged with GenAI while working on a graded coding assignment in the same course. I draw from data from the GENIAL project at the London School of Economics (LSE) that involved ChatGPT chat logs and the version history of their work. I looked at a snapshot of 12 days, a selected period where students worked on a particular assignment and, using timestamps of interactions, the content of chat messages, and code revisions, I performed a kind of 'forensic approach'. By
identifying when and how precisely these students interacted with ChatGPT, it is possible to pinpoint how those interactions impacted, positively and negatively, what they were writing in their draft submissions at the time.
For instance, despite both students initially recognising ChatGPT's recommendation of an
inappropriate coding library, the chat logs reveal the precise moment Student A gave in, trusting the chatbot's output instead of what they had learned. I show how this single moment
compromised their entire learning progress afterwards. In contrast, we have a student who had more agency and made more resourceful use of the tool, which illustrates how GenAI can be more than just a boost in creativity but also in learning. Student B constantly 'challenged' the output of ChatGPT, pointing to teaching material from the course that
worked when ChatGPT's suggestions didn't. They would also use ChatGPT for hours to
review previous exercises before starting work on the graded assignment.
These case studies, only a piece of the complete analysis of the GENIAL project that will be made public soon, contribute to the ongoing conversation surrounding GenAI in education, demonstrating its dual nature as both a potential catalyst and an obstacle to student learning despite the student's eager adoption of the tool and keen interest in learning. The linkage
between ChatGPT usage and the evolution of drafts also allows for unique insights into the cognitive process undergraduate students go through when using GenAI. If integrated well - and I demonstrate how - this new technology can help us integrate new forms of self-reflection on the part of students, which, when coupled with precise feedback on both the outcome and the process by which the student went in their learning journey, there is a possibility we might achieve more meaningful learning experience for all, even within the constraints and pressures for scale within Higher Education.

Key words:

Generative AI, higher education, student learning

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A framework for Design Based Research into AI to support education for Collective Intelligence

Summary:

This session discusses a framework designed to capture ways in which Artificial Intelligence (AI) systems might support education for what has been called Collective Intelligence (CI), thinking together and solving problems together. As a concept, CI includes collaborative group learning (CSCL), as well as broader aspects of collective problem-solving and decision-making, which in turn often involves larger groups and indirect forms of engagement, such as crowdsourcing or citizen science. Many of the global challenges that we face today (for example, the climate emergency) stem from human activity that we argue has not been collectively intelligent. However, we propose, that one way to respond to such challenges is through the design of education to promote CI, which might involve the judicious application of appropriate AI systems. The framework being presented emerged from a comprehensive scoping review of existing examples of AI systems being used to support CI. It systematically outlines the ways in which AI might support education for CI and, coupled with a proposed design-based research (DBR) approach, offers a pathway for future research in this area. Following an initial review of the literature, we identified 45 empirical studies that focused on AI systems being used in education for CI, and undertook an iterative qualitative synthesis through thematic analysis, identifying patterns and themes from which emerged the proposed framework. This categorises the approaches into three dimensions: grouping, process, and staging. We found that AI systems being used to support group formation (grouping) based on criteria such as knowledge levels, skills, and other characteristics, with the intention of creating balanced groups that could work effectively together. AI was also being used to assist in orchestrating the micro-processes of collaborative dialogue (process) by monitoring interactions, providing real-time feedback, and identifying and encouraging productive dialogue moves. Finally, AI was sometimes guiding groups through the stages of longer-term collaborative projects (staging), providing prompts and scaffolds to ensure each phase was completed effectively. We additionally found that AI might be presented to learners in one of two modes: embedded into the environment in the form of prompts or as an identifiable agent for learners to interact with, and across different scales (from supporting small groups to larger or unbounded CI projects). We also report on a number of apparent gaps, with few or no studies into some aspects of AI and CI. We call for more design-based research building on the proposed framework, developing effective ways to use AI systems to support the education of students for Collective Intelligence.

Key words:

Collective Intelligence, Artificial Intelligence, Education, Collaborative learning

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Dialogic Uses of Generative AI in PhD Scientific Writing: Expectations, Realisations, and Motivation

Summary:

This study explores the dialogic uses of Generative AI in online scientific writing courses for PhD students at the University of Eastern Finland in 2023. The primary goal was to examine how AI-driven dialogue could assist students in overcoming common challenges in academic writing. Following a Design-Based Research (DBR) approach, the study employed iterative cycles of design, implementation, and refinement of AI-based activities across three teaching experiments. A total of 67 PhD students from diverse fields, including social sciences, medical studies, and engineering, participated in the study. This diversity enabled an evaluation of how students from different disciplines interacted with AI tools and whether these tools addressed discipline-specific writing challenges. Delivered entirely online, the courses integrated ChatGPT-3, Perplexity, and Elicit.ai as dialogic partners, providing real-time guidance and feedback. The course design emphasised active engagement with these AI tools, encouraging students to integrate AI feedback into their writing processes. The study began with focus groups during the first lesson of each course to gather students' expectations, concerns, and writing challenges. A qualitative analysis of the data was conducted using thematic analysis, which revealed three core challenges: difficulty in understanding and articulating complex concepts, problems with structuring and finding direction in writing, and low confidence in developing a strong academic writing voice. These themes were tracked throughout the course using self-reported progress, forum discussions, and mini-interviews. Self-reported progress captured the ongoing struggles that students faced in real time, while forum discussions and mini-interviews provided more detailed insights into these challenges as students engaged with the AI tools. Three types of AI-driven activities were developed to address these issues. First, clarity-enhancement exercises encouraged students to use AI to simplify complex ideas by drawing on relevant literature and breaking down difficult concepts. Second, direction-finding activities helped students organise their thoughts and structure arguments with AI, offering instant feedback on writing flow and coherence. Finally, confidence-building tasks provided personalised feedback on tone, style, and expression, helping students cultivate a more assured academic voice. Overall, the findings demonstrated a strong connection between AI affordances and a reduction in students' uncertainty and frustration during the writing process. As a result, students experienced increased motivation, confidence, and productivity in their writing. A surprising result emerged: students reported a significant boost in confidence when receiving critical feedback from AI tools compared to feedback from human instructors. Many students perceived AI criticism as neutral and objective, which reduced their fear of judgment and encouraged them to take more risks in their writing. This led to better motivation and a greater sense of ownership over their academic voice. These findings suggest that dialogue with AI has significant potential to help students overcome specific writing challenges. AI-driven interactions foster deeper engagement, enhance motivation, and boost confidence in academic work. Furthermore, the study demonstrates that AI has the capacity to transform writing instruction in online settings, offering meaningful support that empowers students to become more self-assured and effective academic writers.

Key words:

Generative AI, Dialogic Learning, AI-driven Dialogue, Online Scientific Writing Courses, Academic Wriitng, Design-Based Research.

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Education in the age of GenAI: the potential for deconstruction of digital architecture of knowledge

Summary:

Traditionally, educational institutions have struggled to promote interdisciplinary collaboration and the prospect of resultant developing epistemic insight. Academic disciplines are often organised separately, like individual silos of knowledge. As a result, when researchers try to explore new questions that span multiple disciplines, they encounter obstacles due to the differences in how each field is organised. This concept isn't limited to physical institutions; it's also present in the digital world. The digital architecture of knowledge on the internet is compartmentalised and when we use popular tools like search engines to find information, they present it in a manner which can make it challenging to explore connections between different topics. This can limit our ability to tackle complex issues that require epistemic insight.

Enter GenAI. This computational innovation, properly utilised by the user, has the potential to deconstruct the digital architecture of available knowledge and enhance human users' metacognition and interdisciplinary knowledge in a way not seen before in the digital age of education. Our Epistemic Insight-Discipline Wheel (EI-DW) is one such GenAI which has been specifically designed with epistemic insight in mind, dismantling the constraints of current virtual knowledge architecture, and bringing into the light a true interdisciplinary method for exploration of new and emerging questions in education.

Key words:

Generative Artificial Intelligence (GenAI), Epistemic Insight, Interdisciplinary, Knowledge Architecture

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Attitudes of Sociology Students in Croatia on the Use, Ethical and Security Implications of ChatGPT in Education

Summary:

This paper explores the attitudes of sociology students in the Republic of Croatia regarding the use, ethical and security implications and use of artificial intelligence (specifically, ChatGPT) in education and studying, employing the theory and TAM (Technology Acceptance Model). The research aims to apply TAM model constructs: perceived usefulness, perceived ease of use, internet trust, attitude toward behavior, subjective norm, perceived behavioral control, and intention to use (adopted from Klačmer, 2020) to understand AI acceptance in the educational context among sociology students. A survey is conducted on a non-probabilistic sample of 200 undergraduate and graduate sociology students at five universities in Croatia (Faculty of Croatian Studies, University of Zagreb; Croatian Catholic University; Faculty of Humanities and Social Sciences, University of Zagreb; Faculty of Humanities and Social Sciences, Osijek; Faculty of Humanities and Social Sciences, Zadar; Faculty of Humanities and Social Sciences, Split). The limitations of this study are reflected in the non-probabilistic nature of the sample, making generalization of results impossible. However, given the lack of research on this topic in the Croatian context, the results will undoubtedly have theoretical and practical value. The practical implications of this paper relate to insights into the extent of ChatGPT usage by sociology students for educational purposes and their attitudes toward the ethical and security implications of using ChatGPT, which will be valuable for universities in drafting new and revising existing ethical code documents in the academic community regarding AI tools usage. Future research perspectives include expanding this survey to all students of social sciences, humanities, natural sciences, technical and biotechnical sciences, biomedicine and health, and artistic fields in Croatia. Additionally, beyond quantitative research methods, future research should include qualitative methods to gain more comprehensive insights into the overall picture.

Key words:

TAM model, artificial intelligence, ethics, security, education, student attitudes, sociology, Croatia

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Navigating the Complexities of AI Integration in Higher Education: From Tool Development to Adoption Challenges

Summary:

The integration of artificial intelligence (AI) in higher education offers both opportunities and challenges, particularly in responsible AI adoption and in expanding the dialogic space between humans and machines, a dialogue that is founded in university-developed tools. This presentation outlines AI adoption challenges in higher educational education, derived from a series of projects and initiatives. A central aspect of my research involves an Action Design Research project where I developed an AI-based formative feedback tool in November 2022 (Fischer et al., 2022) which since was further adapted to student and educator needs in four distinct development cycles. Ethical considerations have been important throughought the development phase and are also explored through open-access teaching case studies on AI ethics (Fischer, 2024; Fischer, 2023; Fischer et al., 2021). I advocate for a shift towards more flexible and expansionist curricula with educators moving into the role of facilitators (Fischer and Dobbins, 2023) and further interdisciplinary collaborations to transform teaching and learning (Fischer et al., 2023; Lawrence et al., 2024). My presentation will contribute to a deeper understanding of AI's role in education and provide valuable insights for educators and institutions seeking to navigate the complexities of effective AI tool development, adoption, and integration.

Key words:

Action Design Research (ADR), AI tool development, Formative feedback, AI adoption challenges, AI Ethics.

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Between Fear and Hope: Current Discussions on
Artificial Intelligence in Higher Education

Summary:

This paper provides an examination of the impact of generative artificial intelligence (GAI) on higher education, focusing on its rapid integration and diverse applications within universities. The review encompasses a wide array of academic publications and reports from 2007 to 2024, highlighting the exponential growth in GAI-related research, particularly after the release of ChatGPT. The analysis reveals a surge in publications with thematic focuses such as academic integrity, teaching innovations, and technology acceptance, with the United States, China, and the United Kingdom leading in research output. Despite the potential of GAI to transform educational practices, the literature predominantly reflects an AI-negative tone, emphasizing ethical concerns such as plagiarism, academic misconduct, and the reliability of AI-generated content. Notably, there is a significant gap in empirical studies, with many publications offering theoretical discussions rather than robust data-driven insights. The review identifies two primary research focuses: (a) GAI practices in universities and (b) regulatory mechanisms for its use, categorizing findings by user activities and incorporating managerial aspects of GAI integration. The existing studies do not pay significant attention to grass-root innovations coming from faculty and students.
General picture of research
- A lot of "quasi-theoretical" discussions focusing on risks and "normative" (regulatory) publication
- A lot on AI curriculum (AI teaching)
- Ethics and cheating – dominating topics
- Almost no comparative and longitudinal research, experiments. Deficit of empirical studies.
- Very rare – connections between the technology and social (psychological) effects
- No studies of interplay between "organic" and "managed" adoption of AI in education
Obvious research gaps
- Practical studies on ethical challenges and potential solutions related to GenAI, with a focus on consequences.
- Investigation of changes in learning methods and cognitive mechanisms due to GenAI integration.
- Analysis of changes in students' writing skills, creativity, and fact-checking abilities due to GenAI usage.
- Estimation of changes in everyday teaching practices and the penetration level of GenAI instruments into the education process.
- Exploration of changing power dynamics in the classroom and mechanisms of knowledge transmission.
- Influence of regional and cultural contexts on GenAI usage and changes in students' customs and motivation over time within a comparative framework.
- Examination of regulations in higher education, with a focus primarily on IT and engineering disciplines.
- impact of GenAI on equality an access
The review calls for a balanced approach to leveraging GAI, recognizing its transformative potential while addressing ethical challenges.

Key words:

Higher Education, GenAI, grass-root innovations

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Transhumanism and the Future of Human - AI:
Philosophical Implications for Education and Identity

Summary:

This presentation offers a philosophical and analytical examination of the cyborgization of humanity and its broader implications. It critically examines the various facets of humanity's future in the context of ongoing and forthcoming cyborgization, questioning the nature of human identity in light of technological and scientific advancements, including potential interactions with machines and artificial intelligence. The analysis includes an exploration of ontological implications for future human and societal development. The discourse contrasts divergent views on cyborgization: one perceiving it as a potentially destructive transformation and the other as an optimistic evolutionary progression. The possibility of a "third way" is also explored. The presentation addresses how enhancements in both physical and cognitive domains will necessitate a radical rethinking of human capabilities, shifting traditional boundaries and limitations. It anticipates significant changes in scientific, educational, and philosophical domains regarding technological and genetic enhancements, human-robot integration, and artificial intelligence. Ethical considerations are raised concerning the augmentation of human abilities, particularly issues related to the definition of humanity, ownership, and control of personal information embedded within biological and cognitive systems. The discussion seeks to advance cyborg ethics and explore the principles of cyborgoethics as a framework for addressing these emerging challenges. As artificial intelligence (AI) increasingly integrates into educational environments, it catalyzes transformative shifts in our society. Digital future characterized by advanced human-machine collaboration, reshaping educational landscapes through enhanced personalization and automation. We explore how AI-driven tools align with transhumanist ideals of augmenting human cognitive and learning capacities, and assess the potential of cyborg frameworks to revolutionize the interaction between humans and educational technologies. Furthermore, we address the ethical dimensions of these advancements, including concerns about privacy, equity, and the potential dehumanization of educational experiences. This paper explores the intersection of AI in education with transhumanist philosophy and the concept of cyborgs, focusing on the implications of AI and concerns about privacy and the digital divide. We investigate how AI technologies, align with transhumanist goals of enhancing human capabilities and cognitive functions. Additionally, the integration of AI as a cyborgian enhancement challenges traditional educational paradigms, proposing a future where human-machine collaboration redefines cognitive processes. Through a review of current AI applications and theoretical perspectives, this study highlights both the potential benefits and ethical considerations of merging AI with humans. We conclude by discussing the implications for future educational frameworks and the necessity for thoughtful integration of AI to balance technological advancement with humanistic values.

Key words:

Artificial intelligence (AI), cyborgization, human enhancement, human – robot interaction, identity, transhumanism

Abstracts:

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GenAI-led educational opportunities and challenges in the context of higher education

Summary:

Our education systems have been acutely shaped by the rapid digitalisation of services. Recent interventions in the form of artificial intelligence, particularly the rise of language learning models (LLMs) (for example, ChatGPT), have effectively perturbed the teaching and learning industry across educational levels and institutions globally. Despite the plethora of views across sectors, there are relatively fewer empirically charged scholarly discussions on the issue. Redressing this gap, this project explores opportunities and challenges of using generative artificial intelligence (GenAI) vis-à-vis academic integrity in higher education (HE) settings. Fieldwork for this project was carried out between September and December 2023. It involved semi-structured one-to-one formal interviews (n=10) and two focus groups (n=5) with educators who at the time of the fieldwork also played the role of academic integrity officers (AIOs) across faculties at a Russell Group university in England. Research findings suggest that GenAI as a shadow education (or e-tutoring) tool can be beneficial in terms of expanding access to multiple knowledge bases and digital skills of future graduates. At the same time, its use has the potential to disrupt current quality assurance practices and undermine university principles and values of cultivating critical and creative thinking and learning skills – notably through the homogenisation of learning experiences often based on erroneous (and un-equalising) assumptions. Furthermore, staff views on GenAI vary by discipline due to, for example, their teaching and learning practices, the perceived relationship between HE and the relevant industry, and assessment modes and designs. Key recommendations include a clear university-level policy on GenAI use and revitalisation of academic integrity education and guidelines in partnership with staff and students across and within disciplines.

Key words:
Generative artificial intelligence, Educational opportunities, Educational challenges, Qualitative research, Disciplinary comparisons, Higher education

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Human-AI collaboration and the future of education

Abstract:

Artificial Intelligence (AI), including generative AI (GenAI), is rapidly transforming educational settings in many ways. To succeed in our today's society, learners need to combine expertise and ideas, solve problems and create new knowledge in various collaborative situations. In the age of generative AI, this means coordinated working not only with co-learners, but also increasingly with multiple agents, including learning technologies. Since this is likely to extend spaces for learning and collaboration (e.g., to virtual environments), it also calls for research on human-AI-human interaction and the way in which AI can support learning and interaction processes (Cress & Kimmerle, 2023; Tan et al., 2022). Everyday interaction with AI is often seamless and implicit (e.g. recommender systems), whereas explicit interaction with AI agents (e.g., chatbots and intelligent tutoring systems) has the potential to provide personalised learning support for individuals and groups. Lately, the process of collaboration between humans and AI has been named as Hybrid Intelligence (HI) (Molenaar, 2022). By leveraging strengths and mutually compensating weaknesses of humans and AI, HI has the potential of augmenting the capabilities of humans to work and learn more effectively together (Cukurova, 2024).
Nonetheless, in addition to cognitive skills, human learning encompasses emotional and social components (Martınez-Miranda & Aldea, 2005), and the ability to interact with others and the world (Cukurova, 2024). Those capabilities are currently lacking in AI systems. In our presentation, we will introduce an ambitious research agenda related to human-AI collaboration in our EDUCA Flagship project (https://educaflagship.fi/en), funded by the Research Council of Finland and bringing together academic and non-academic partners. The aim of EDUCA is to address the education of the future to support learners in reaching their potential by designing and implementing more adaptive education. We will investigate within-person, within-group, between-group and contextual variability in technology-enhanced learning and build next-generation, adaptive AI-based models to identify challenges and affordances for personalised learning. We will also explore the ways in which teachers integrate (generative) AI and learning analytics into teaching and learning. We will discuss the upcoming research focusing on how cognition is distributed among learners and teachers, AI and their environments, and what human-AI-human collaboration could potentially mean for the present and future of education.

Key words:

AI in education, human-AI collaboration, Hybrid Intelligence (HI), adaptive learning

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The ethical debates, impact and relevance of using AI large language models (LLMs) in exam-driven classrooms - a sixth form college case study

Summary:

This is a case study of a practitioner research group at Hills Road Sixth Form College, Cambridge. A group of teachers have been exploring the impact of using large language models of artificial intelligence such as ChatGPT in their classrooms. LLMs can be used to rapidly create revision notes, condense large amounts of text, and explain concepts to aid student understanding. However, all these AI advantages take place within the context of exam-focused curricula in which students are expected to demonstrate their own knowledge and to be able to present that in coursework and under examined conditions (Gov.uk, 2023). LLMs offer students methods to create large amounts of text and complete non-examined work by entering the correct prompt (Watson & Romic, 2024). It is this dichotomy of benefits and risks that teachers at Hills Road have been attempting to negotiate. How do we teach students to use AI technology appropriately? And how to we engage with students to ensure that they learn to work effectively and ethically independently? This report presents the findings of a practitioner research case study that has been taking place in the college over the last year and identifies themes and recommendations for appropriate use of LLMs in teaching including examples from 5 sixth form teachers using LLMs in their teaching.
The research will present the findings within these six categories and future impact that these might have on teaching, research and examination and assessment.

Key words:

Knowledge and theory, Personalising learning and feedback, Critical thinking, Ethical considerations, Exam system, AI literacy

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Replacing Dali with DALL:E – Recreating a 1960's 'Happening' to understand the impact of Industrialised Creativity on Performance

Summary:

Marshall McLuhan suggests that the great success of foundational technologies often leads to unintended negative "flip out" consequences—outcomes that are nearly impossible to predict. Similarly, Virginia Heffernan observes that new media technologies inevitably involve both "magic and loss," though fully understanding the nature of that loss is challenging. In today's era of industrialised creativity, technology increasingly seeks to replace human ingenuity. Could we, as creators, become "the loss"? To explore this question, the Media Arts Department at RHUL re-created a famous 1960s 'Happening,' where Salvador Dalí, Manitas de Plata, and José Reyes celebrated Catalan culture at the United Nations. While Manitas played flamenco guitar and José Reyes sang cante, Dalí painted. In our reimagining, a student jazz band and performance poets performed live before an audience. However, in place of Dalí, we connected to DALL-E's API, asking it to "paint" what it heard. This experiment serves as a reality test for the tension between human creativity and AI, probing whether the "loss" lies in the replacement of human expression.

Key words:

Industrialised Creativity, AI and Human Interaction, New Media Technologies Impact, DALL-E AI in Art, 1960s 'Happening' Re-creation

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What does it take to cultivate authentic and expansive epistemic agency on the part of students in an AI-assisted academic landscape?

Summary:

Generative Artificial Intelligence (GenAI) offers new opportunities for staff and students in Higher Education. At the same time, though, the capacity of GenAI tools to produce extensive, convincing output in response to user prompts has sparked a crisis in assessment integrity, given the scope for students thereby to circumvent learning. This presentation reports on a project that investigated student and staff perspectives on student use of GenAI tools within a School comprised by disciplines from the social sciences in a UK research-intensive university. The research was based on a sequential mixed methods design, incorporating two surveys (one each for staff and students) and focus groups with members of staff. In addition to providing an overview of staff and student perspectives on student use of GenAI tools, the study found that many students are adopting narrow or uncritical forms of epistemic agency in their GenAI usage, where epistemic agency is understood as the capacity to build, use and transform knowledge. It was evident that students made heavy use of GenAI tools (although not as heavy as staff thought was the case), but that the purposes to which the tools are put could be characterised as restricted and, at times, inauthentic. For instance, students reported that they primarily employed the tools for such tasks as grammar checking, translating text from one language to another, and generating initial ideas for assignments. Furthermore, it was likely that use of GenAI tools had probably worked to circumvent knowledge building processes for some students. The study also exposed marked variation in staff members' readiness to exercise pedagogic agency—that is, human intentional action to shape educational experiences—in relation to GenAI. While some educators straightforwardly integrated GenAI into teaching, others expressed discomfort in relation to action that sought to address student use of GenAI tools; with associated variation evident in staff expertise in GenAI tool usage. Indeed, it was clear that that many academics in the research site are yet to be convinced of the need to address student use of GenAI. While such diversity is to be expected given that widespread, direct use of GenAI tools is relatively recent, its presence nonetheless poses challenges for institutional attempts to develop cohesive approaches to GenAI integration.

The research challenges us to establish pedagogic practices that cultivate effective forms of epistemic agency, preparing students for a world where human-machine partnerships are integral to knowledge work and decision-making. For students, this means cultivating more expansive and critical forms of epistemic agency that leverage GenAI's capabilities while recognizing its limitations. For educators, pedagogic agency should orchestrate meaningful human-machine collaborations that enhance rather than diminish students' knowledge-building capacities. The project underscores the importance of addressing how pedagogic agency of staff is supported within universities, highlighting the importance of responsive policy formation, active policy dissemination, collegial environments, hands-on professional development, robust curriculum design processes, and measured quality assurance processes; at least if universities are to redesign education in a manner that is suitable for an AI-assisted world.

Key words:

Generative artificial intelligence (AI); epistemic agency; pedagogic agency; human-machine partnership; students

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Duality of Self-programming: Self-generated Text as a Multimodal Medium between Generative AI and User

Summary:

This paper explores the concept of self-programming within Niklas Luhmann's social systems theory, applying it to both generative AI systems and their users. It investigates how generative AI models, such as ChatGPT, engage in self-referential processes, utilising recursive feedback loops and memory to refine their operations based on past data. These processes align with Luhmann's notion of self-programming, where systems condition their future actions by creating internal rules and codes. The study further explores how users of generative AI also engage in self-programming by adapting their prompts based on prior interactions with AI. This mutual adaptation establishes a dualistic dynamic, where both AI and the user influence and refine each other's actions. The generative AI's evaluation of coherent/incoherent distinctions interacts with the user's evaluation of relevance, creating a feedback loop that informs future queries.The text generated by these interactions is framed as a multimodal medium, which serves as a common ground for the structural coupling between AI and the user. This medium allows for the seamless transition between various forms of interaction, such as text, voice, and image, while maintaining the coherence of the process. The paper also addresses the paradoxes of specificity versus generality and old versus new within these interactions, examining how novelty in AI-generated content can quickly become familiar and lose its informational value. Finally, the study discusses how both users and AI navigate complexity through self-generated questions and the deconstruction of writing styles, offering insights into the evolving nature of human-AI communication.

 Key words:

Generative AI, Self-programming, Niklas Luhmann, Systems Theory, Duality, Style

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Navigating the Challenges of AI Integration in Global South Higher Education: A Technocritical Approach

Summary:

The rapid integration of generative artificial intelligence (GenAI) into higher education presents both opportunities and challenges, especially in Global South (GS) contexts. This paper explores how human-machine collaboration and the expansion of dialogic spaces in education can help address issues surrounding GenAI's adoption, particularly its impact on equity and critical engagement. While GenAI tools have promising pedagogical potential, they risk reinforcing digital inequalities in regions with limited access to digital resources. This study examines the tension between the promise of AI and the reality of its implementation in GS higher education institutions.

The integration of AI in higher education (HE) has been met with optimism about its ability to support diverse learning needs. However, existing power imbalances between the Global North and South mean that GenAI tools, often developed in the North, may not adequately reflect the lived experiences of GS students. This can result in forms of digital colonisation, where AI tools perpetuate Western-centric narratives and exclude contextually relevant content. The paper underscores the need for more critical engagement with AI, particularly in underrepresented contexts.

A key theoretical contribution of this paper is its advocacy for a technocritical approach, which builds on critical theory and technorealism. It challenges the reductive nature of techno-optimism and techno-pessimism, which often overlook the complexity of power relations in technology adoption. Technocriticality intentionally interrogates the socio-political dimensions of technology. GenAI tools are not neutral, but socially constructed and shaped by specific societal biases. By adopting this perspective, the paper reveals AI's evolving design and usage as a "terrain of struggle," where technologies developed primarily in the Global North influence the education of students in the GS, often without accounting for local contexts. This approach calls for a participatory and collaborative approach to the development and adoption of emerging AI tools, especially in the GS.

Using Eduvos, a South African higher education institution, as a case study, this research examines the institution's response to these challenges. In 2024, Eduvos established an AI committee to provide guidelines on the responsible and critical use of GenAI. The committee facilitated virtual discussions to address lecturers' and students' concerns around GenAI's use in teaching and learning. It also guided the 'AI-responsive' design of take-home assessments for 87 modules. A technocritical framework structured these conversations, guidelines, and reflections, prompting questions about how human-machine collaborative learning can both erode and enhance dialogic learning.This study contributes both theoretically and empirically to the growing discourse on AI in HE. Theoretically, it advocates for a technocritical stance foregrounding the ethical complexities and pedagogical implications of GenAI in GS contexts. Empirically, it presents practical examples of how institutions can design assessments and curricula that incorporate GenAI in ways that support, rather than hinder, critical engagement and dialogic learning.

Key words:

Artificial Intelligence; Assessment Design; Higher Education; Global South; Technocritical

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To bot or not(e) – Effects of large language models and note-taking on text comprehension and retention

Summary:

Research has begun to investigate how large language models (LLMs) affect various educational aspects, including problem-solving, reading motivation, and peer feedback. Yet, very little is known about how the use of LLMs may affect the very foundations of learning – comprehending and retaining information. Examining such fundamental elements of cognition is crucial amidst students' widespread use of AI chatbots. We therefore examined how secondary school students' text comprehension and retention are influenced by learning a text with an LLM compared to (a) the more traditional strategy of note-taking, and (b) using an LLM alongside note-taking. The study was a pre-registered randomised controlled field experiment with within- and between-participant design elements.

Participants were 405 Year 10 students (aged 14-15 years) from seven secondary schools in England. Of these, 344 were retained for the analyses (56.7% male). The experiment consisted of a learning session and a test session, which were three days apart. In the learning session, students' task was to understand and learn two text passages on a different history topic, each using a different active learning strategy (condition; NOTES, LLM or LLM+NOTES). Each student was randomly assigned to one of two groups. Group 1 was exposed to conditions LLM and NOTES and Group 2 was exposed to conditions LLM and LLM+NOTES. The order of conditions and passages was randomised. Students also responded to survey questions about their learning experience. In the test session, students answered a range of questions assessing their comprehension, retention and free recall for both passages. Both sessions ran entirely on a web browser. Participants interacted with an easy-to-use interface and independently navigated through the experimental screens. For the LLM functionality, we used an Azure-hosted instance of OpenAI's GPT-3.5 turbo model. We ran three mixed-effects regression models, one for each outcome (retention, comprehension, free recall). Student ID was modelled as a random effect and all other independent variables were modelled as fixed effects. This included school, group, and condition. We controlled for gender, passage, task and test order, eligibility for free school meals, English as an additional language, and whether students studied GCSE History. Results showed that students performed better on all outcomes when taking notes compared to using the LLM, and they performed better on retention and comprehension when combining LLM use with note-taking compared to using the LLM alone. Despite this, survey responses indicated that students found the LLM more helpful than note-taking. Similarly, more students preferred LLM use over note-taking, but they did prefer LLM+NOTES over LLM. While we found no differences in task interest between conditions, students found LLM use more enjoyable than note-taking and they thought that note-taking as well as LLM+NOTES were more difficult than LLM use. We will discuss possible explanations for the results, including potential differences in cognitive engagement, familiarity effects, the nature of LLM strategies, and information overload. Implications for education will also be discussed.

Key words:

Comprehension, Experiment, Large language models, Note-taking, Retention, Secondary school

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Towards a Theoretical Framework for Integrating Generative AI in UK School Pedagogy; Opportunities, Challenges, and Future Direction

Abstract:

This theoretical position paper delves into the exploration of Generative Artificial Intelligence (GenAI) teacher pedagogy within UK formal school settings, aiming to elucidate the theoretical foundations underpinning this innovative approach to teaching and learning. Drawing on a range of key theoretical perspectives, including constructivism, connectivism, cognitive load theory and technology acceptance model the paper articulates a robust framework for integrating the GenAI tool into educational practices. By synthesising existing theories with the unique affordances of GenAI technology, the paper proposes a theoretical model that highlights the potential of GenAI to enhance teacher-student interactions, personalise learning experiences, and optimise instructional strategies. The theoretical framework outlined in this paper not only underscores the transformative potential of GenAI teacher pedagogy but also offers practical insights into its implementation in the UK primary and secondary school contexts. By leveraging GenAI to support differentiated instruction, facilitate formative assessment, and foster student engagement, educators can harness the power of GenAI to create more dynamic and responsive learning environments. However, the paper also acknowledges the critiques and challenges associated with integrating GenAI into teaching practices, emphasising the importance of addressing ethical considerations, promoting equity, and redefining teacher roles within this evolving educational landscape. Looking ahead, the paper calls for future research to further refine theoretical frameworks and explore emerging technologies that will shape the evolution of GenAI in education. By staying attuned to theoretical developments and technological advancements, educators, policymakers, and researchers can collaboratively chart the course for the effective integration of GenAI teacher pedagogy in educational settings. Ultimately, this paper advocates for a critical and rigorous examination of the theoretical underpinnings of GenAI in education, underscoring the need for a nuanced understanding of how GenAI can transform teaching and learning practices in the UK and beyond.

Key words:

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The Impact of Artificial Intelligence on Learners and Teachers: A Mathematics Education Perspective

Summary:

When the education sector lags behind advancements in the technology industry, many learners and teachers explore the use of emerging technologies in learning and teaching contexts, often without guidance on their optimal use in educational or pedagogical settings. However, it can be difficult for those with limited understanding and knowledge of technology to identify which digital resources are pedagogically reliable, and teachers may find it challenging to find the time to learn how best to utilise emerging digital resources. Artificial Intelligence (AI) is a key element in the technological revolution, and it is important to consider the most efficient ways to harness its potential in education. Thus, we are proposing a new and effective e-learning model that supports this goal. This research provides a broad overview of the major AI-powered features that could hold educational and pedagogical value: namely, natural language processing, personalised learning and generalisation. With a particular focus on mathematics education, this research also proposes pedagogical recommendations on adopting AI tools that can encourage creativity and critical thinking in teaching and learning. In addition, prominent issues and challenges raised by AI-powered tools are addressed, including academic integrity, digital inclusion, limited mathematical capabilities and public attitudes.

Key words:

Artificial intelligence in education (AIED), Effective e-learning model, Digital inclusion, Mathematics education, Mediation, Zone of proximal development (ZPD)

Dr Joleen Liang
Squirrel Ai Learning

Revolutionizing Education: Commitment to Personalized Learning Through Large Adaptive Model (LAM)

Summary:

In today's rapidly evolving educational landscape, artificial intelligence is revolutionizing teaching and learning methods, with Squirrel Ai leading the charge. This presentation, led by Dr. Joleen Liang, co-founder of Squirrel Ai, will examine the significant impact of AI on education and the principles of AI adaptive learning. Key topics will include the innovative solutions offered by Squirrel Ai, such as the Large Adaptive Model (LAM) and the integration of technology in classrooms. Traditional education often struggles to meet the diverse needs of individual learners, but AI adaptive learning is emerging as a vital trend in personalized education. Research from Ernst & Young underscores that L0-L5 level AI adaptive learning is a critical direction for intelligent and customized education. Squirrel Ai's technology complements traditional teaching methods, enhancing the educational experience without replacing human instructors. The successful implementation of these products in schools highlights their effectiveness in empowering students to reach their full potential. Squirrel Ai's mission transcends technology, aiming to create equitable educational opportunities that ensure every child has the tools necessary for success, regardless of their background. The presentation will also explore the innovative machine-learning model that addresses learners' root problems through a nano-level breakdown of learning objectives, along with the unique commitment to providing free resources for underprivileged children.

Key words:

AI Adaptive Learning, Squirrel Ai, Personalized Education, Large Adaptive Model (LAM), Equitable Educational Opportunities

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Harnessing AI for Collective Intelligence: A Dialogic Approach to Mobile Learning and Knowledge Creation among Rural Communities of the Global South

Summary:

This project explores the innovative integration of Generative AI with dialogic educational traditions, leveraging a WhatsApp chatbot to enhance adult learning among farmers in rural East Africa. Grounded in the principles of culturally relevant, dialogue-based education, this approach creates a continuous feedback loop between learners and AI, enriching the 'Learning with Mobiles' paradigm. The chatbot fosters ongoing dialogues that reflect the local community's knowledge while also contributing this curated knowledge into future training datasets for Large Language Models (LLMs), positioning local insights as central to the broader AI development landscape. This presentation will discuss the critical need for culturally attuned and contextually aware technology, the potential of dialogic AI to deepen human-machine interaction, and how future AI systems can incorporate user-curated knowledge to become truly inclusive learning tools. By drawing on indigenous dialogic practices and integrating user feedback into AI's development, this project offers a scalable model for the future of education, where human-AI dialogue amplifies collective intelligence and sustains local cultural practices within global AI ecosystems.

Key words:

Generative AI, Dialogic Education, Culturally Relevant Technology, Inclusive Learning

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Using a Human-Centered Design Method for Examining Teachers' Hopes and Concerns for Classroom Orchestration with AI Assistants

Summary:

Teachers' perspectives of emerging technologies are essential for understanding their needs, hopes, and their perceived educational possibilities for integrating such tools in their classrooms. With the increased rise and presence of technologies like Generative AI in our lives, education institutions and organizations, such as UNESCO or OECD across various geographies urge teachers to develop competencies to integrate and use such tools in their pedagogy and classrooms.Prior work in educational technology, has explored such phenomena through various framework, such as: Technological Pedagogical Content Knowledge (TPACK) (e.g., Mishra, 2024) and Designing for Orchestration of AI (e.g., Holstein et al., 2019). Such work assert that, to integrate AI tools in educational settings, teachers face a challenge in orchestrating between their pedagogical approaches, technological infrastructure, and organization of learning activities and content around these tools. Amidst this challenge, the question of what educators would give away to AI tools or want to keep in their educational practice in relation to emerging technologies or even ready for such rapid changes, is yet to be explored. The purpose of this presentation is to present a human-centered methodological approach that helps to incorporate educators' voices and their imagined affordances (Nagy & Neff, 2015) of AI technologies as we are engaged in conceptualizing AI literacies.

Specifically, we use a qualitative human-centered design approach to examineteachers' perceptions of AI, their pedagogical approaches in general and in relation to technology, and hopes and concerns for integrating such technologies in their practice. This presentation will discuss three parts of our work: (1) initial testing of a human centered design method for writing love and break-up letters (Walker et al., 2018) to AI assistants among four co-authors; (2) We illustrate of educators hopes, concerns, and perceived relationship to AI tools drawing on examples from 16 semi-structured interviews and 32 writing outcomes of love/break-up letters used as human-centered design activity with educators from eight countries; and finally (3) We connect these two to our emerging conceptualizing of AI literacies as a framework that extends beyond competencies and skills towards acknowledging the technological, sociocultural, critical, and emotional dimensions that may shape literacies demands. Overall, this presentation offers insights into teachers' perspectives of emerging technologies like AI across multiple geographies and provides a methodological approach to support teachers' articulations of their hopes and concerns towards their relationships to technologies.

Key words:

AI literacy, teachers, Technology affordances, human-centered design

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AI Enthused Classroom

Summary:

As we rapidly progress into an evolving landscape in education, Generative AI has become a necessity not just a possibility. As academic staff, support staff and students embark on this transformative journey, it was key at the onset for Curriculum AI leads within South West College to ensure adequate measures were in place and continue to be in place, to provide success and motivation in this changing landscape. Applying a transformational leadership approach within South West College created a focus on inspiring and motivating others towards a vision of enhancing teaching and learning experience in a Generative AI Era. Implementing key objectives for any new initiative is crucial, especially when it comes to integrating GENAI into education. Generative AI can be daunting, and offering mini snapshots or taster sessions allowed staff to explore various AI tools and packages without the pressure of mandatory usage. This approach not only helped staff become more comfortable with the technology but also showcased its potential benefits in a manageable, low-stress environment.

While the integration of Generative AI into education has significant implications for teaching and learning, another crucial aspect which we as a college must now consider is curriculum assessment. It is important for curriculum staff to ask themselves: Are current assessment methods outdated in light of Generative AI's influence on education? There's a growing need to shift from traditional assessment methods to more active learning environments. Project Based Learning (PBL) has emerged as a powerful approach to engage students and develop crucial 21st-century skills. But what changes are required to make this transition, and how can we support both academic staff and students in this new concept? The transition to assessment formats which focus more on process over product represents a significant shift in educational practice, but its benefits are well worth the effort. By implementing these changes and providing comprehensive support to both academic staff and students, colleges and universities can create dynamic learning environments that prepare students for the challenges of the modern world. As we continue to evolve and adapt, collaboration between educational stakeholders will be crucial in offering support and guidance in their journey. By sharing our experiences and insights, we can collectively shape an education system that embraces the power of AI while maintaining the core values of Teaching, learning and personal development. The AI revolution in education is here, however as educators can we remain committed to ensuring our approach to GENAI in Education is both innovative and ethical while being the leaders in its responsible and effective implementation?

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Data Ownership and Privacy Challenges in AI-Powered Personalized Learning Environments

Summary:

With the introduction of generative AI into education, there are now never-before-seen possibilities to transform personalized learning experiences by increasing the dialogic space between humans and machines. With the increasing sophistication of these technologies comes the production and processing of enormous volumes of data regarding the cognitive processes, learning patterns, and creative outputs of students. Although this data is the basis for AI models that have the potential to greatly improve educational outcomes, it also raises important privacy and data ownership issues. Complex issues like intellectual property, student autonomy, and human-machine collaboration in education are at the center of this technological revolution. Ownership and authorship are challenged by generative AI in the classroom. Individual contributions become unclear when students collaborate with AI systems on essays, challenging issues, or creative projects. The rights of students over AI models trained on their data and interactions are also unclear, which has led to a reconsideration of who owns educational data. The application of generative AI is further complicated by the possibility that it will impact educational equity. Although sophisticated tools have the potential to create new digital divides, they can also personalize learning and provide resources that would not otherwise be accessible. Educators and policymakers struggle to ensure equitable access to generative AI technologies without worsening inequalities. Boundaries and safety measures are essential as AI systems gather and examine more data regarding student behavior and learning. Compared to traditional educational records, AI-powered learning systems gather data more longitudinally and granularly, necessitating the creation of strong frameworks to control its use. To keep users' trust, educational AI systems need to strike a balance between effective privacy protections and data-driven insights. Developing generative AI systems that are efficient, transparent, accountable, and educationally aligned presents both technical and ethical challenges. Because some AI algorithms lack transparency, questions concerning fairness, bias, and decision-making justification are raised. Collaboration between educators, developers, and policymakers is necessary to develop AI systems that benefit education. Global approaches to generative AI in education take into account advances in technology, cultural contexts, and educational priorities. This global viewpoint highlights the necessity of collaboration and knowledge exchange to create best practices for the ethical application of AI in education across contexts. A comprehensive strategy is needed to address these multifaceted problems. This entails developing guidelines for the ethical and appropriate application of generative AI in education, putting in place AI techniques that protect privacy, such as differential privacy and federated learning, and promoting communication amongst stakeholders in the educational ecosystem. It's imperative to have candid conversations about how generative AI will affect education. By investigating the connections among AI technology, privacy, equity, and pedagogy, we can maximize the potential of generative AI to broaden educational dialogic spaces. The goal is to design a framework that respects educational ethics and values while optimizing human-machine collaboration.

Key words:

Generative AI, Data Ownership, Privacy, Educational Equity, Human-Machine Collaboration

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AI - Impacts on Cognitive Load for Learning

Summary:

Interest in the application of Artificial Intelligence (AI) is increasing in the Education sphere. Positive and negative perspectives have been put forward about its efficacy from both the teaching and learning perspectives, however there is sparse discussion about its impact on students' cognitive load. The number of AI tools emerging means that a critical assessment of its value within education is required. Some interesting attempts to include AI into existing pedagogy frameworks, e.g. Bloom's Taxonomy (OSU, 2024), Laurillard's (2012) 6 learning styles (Pratschke, 2023). In addition, as online teaching is also increasing, it can be impossible to know how much students are really using Generative AI behind the scenes to aid their learning - even if not for their assignments. This means that outright bans are not likely to be as effective as lecturers and institutions hope. Moreover, as the EU AI act (EU, 2024) comes into force, the use of AI in education is under increasing levels of attention. The focus of all teaching and its most true measurement of success - irrespective of which teaching method is applied - is how well did the student learn. It is to this question that we must return to truly assess the impact of AI in education; does it help students learn or not? And if so, what are the best ways to include it within our pedagogy?Within this context, there are two aspects of learning that we are interested in: 1) Short-term retention, normally illustrated through assessment, 2) Long-term retention for application over longer periods of time. Sweller (1988) identified three main types of cognitive load in learning using problem-solving: 1) Intrinsic - the inherent level of difficulty in a topic that can't be altered, 2) Extraneous - generated by how material is presented, which does not aid learning and 3) Germane- how students process new information into long-term memory. "Effective instructional methods encourage learners to invest free processing resources to schema construction and automation, evoking germane cognitive load." (van Merriënboer, 2005).A key question for AI, for example, becomes "How do we ensure enough cognitive load is being generated to ensure that germane cognitive load is also triggered"? One example is interdisciplinary subjects. Where AI is particularly useful is within one domain. Generative AI accuracy reduces when you attempt to combine two sources together. As a result, for interdisciplinary topics, it may increase the extraneous cognitive load for students dramatically. The concepts of cognitive load provide a useful tool for educators to more precisely define where AI can assist student learning most effectively, rather than reducing it. This paper outlines how to include these concepts into learning design.

Key words:

AI, Cognitive Load, Cognition, Technology, Education

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ChatGPT & Metacognitive Confidence: The Role of Generative AI in Promoting False Certainty Over Critical Thought

Summary:

This study examines the impact of Generative AI (GenAI), specifically ChatGPT, on decision-making accuracy and metacognitive confidence in an educational setting. The research addresses two primary questions: (1) How does the accuracy of decisions made by students using Generative AI compare to those made using traditional methods? (2) How does the use of Generative AI influence metacognitive confidence in the decision-making process among students? A mixed-methods approach combining both qualitative and quantitative data was employed. A two-group quasi-experimental design was conducted with master students from the Luxembourg School of Business (LSB) and the Zagreb School of Economics and Management (ZSEM) (N=48). Students were randomly divided into a control group (traditional decision-making methods) and an experimental group (decision-making with ChatGPT assistance). To simulate a high-stress decision-making scenario, we have adapted the classic Carter Racing case study for the purpose of this paper. After the case briefing, both groups were instructed to discuss the case in teams of 3-5 people. After dicussion, the participants were given a questionnaire designed to assess decision-making accuracy and metacognitive confidence. They were asked to answer only the first question and evaluate how certain they felt about the reached decision (T1). A typical case discussion under the guidance of a professor followed in both groups (the debriefing phase). After the debriefing phase, participants were asked to fill out the remainder of the questionnaire, again assessing their decision-making accuracy and metacognitive confidence (T2). The results indicate that students in the control group, utilizing traditional decision-making methods, demonstrated significantly higher decision accuracy compared to the experimental group using ChatGPT. The accuracy of decisions improved in both groups post-debriefing, but the improvement was more pronounced in the control group, suggesting that traditional, interactive decision-making approaches encourage deeper cognitive engagement and critical thinking. Additionally, while metacognitive confidence increased from pre- to post-debriefing in both groups (control: $t(24) = -3.76$, $p < 0.01$; experimental: $t(22) = -2.08$, $p < 0.05$), the control group reported higher confidence levels at T2 ($t(46) = 2.02$; $p < 0.05$). These findings suggest that over-reliance on AI tools like ChatGPT may undermine the development of critical thinking and reflective decision-making skills, potentially leading to false certainty. This research contributes to the ongoing discourse on the integration of AI in educational settings by highlighting its potential drawbacks. It calls for a balanced approach that leverages AI's strengths while minimizing risks to critical thinking development. Future studies should explore long-term effects and strategies to optimize the use of GenAI in education, ensuring ethical and effective integration that supports rather than hinders student learning and decision-making competence.

Key words:

Generative AI, ChatGPT, Metacognitive confidence, Critical thinking, Decision-making, Education

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The use of Generative AI in Viva-voce examinations within Higher Education

Summary:

The use of Artificial Intelligence (AI) in Education has been a field of interest for decades since the inception of AI. With the recent launch of commercial Generative AI (GenAI) tools such as ChatGPT and Copilot, and their impact in many industrial sectors, the use of GenAI in Education is attracting significant interest among educators and researchers. However, the number of literature surveys published in relation to GenAI is limited and mainly focuses on its use in learning and teaching, its ethical implications and proposes guidelines and frameworks to follow when using GenAI. An area that has not been explored in depth is the potential use of AI for viva-voce assessments in higher education. Integrating AI with viva - voce exams often consist of the need for the development of dialogic spaces and creating environments for human-machine collaboration. This paper presents a review of existing literature that discusses the use of AI in the process of a viva-voce assessment and contains publications between 2000 and 2024 extracted from two databases: Google Scholar and IEEE Xplore. It broadly features the use of AI for roles such as Dynamic Question Generation, Adaptive Level-specific question generation and Grading and Feedback. This review aided the discovery of gaps in research that could be addressed and studied further.

Key Words:

Generative AI, Automated assessment, Viva-voce examination assessment, Dynamic Question Generation, Automated evaluation

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Generative AI in Computer Science Education: Impact on Student Perceptions, Creativity, and Self-Efficacy

Summary:

The study explores how generative AI tools built on large language models such as ChatGPT and Co-pilot impact secondary school students' perceptions, beliefs, and mindsets, particularly in the context of generating digitally created art in Computing. The focus is to discern whether using AI tools enhances or diminishes students' perceived importance of CS, creative expression in creating digital artefacts and programming self-efficacy and mindset. Participants in this study comprised a diverse group of 127 computing students aged between 13 and 14 years corresponding to Year 9 from 6 secondary schools across England. A quasi-experimental approach was employed using a 'within subjects' design and consisted of two interventions, both centred around the creation of a self-portrait using p5.js, a JavaScript library for creative programming. One intervention gave participants an online tutorial and cheat sheet, while the second introduced generative AI LLM assistance to the self-portrait task. After both interventions, participating students completed a questionnaire adapted from the Computer Science Interests and Beliefs Inventory (CSIBI). The findings reveal that both traditional and AI-enhanced methods similarly impact students' views on the value of CS for societal importance, future preparedness, and personal discovery with no statistical differences. Whilst no statistical differences were found in the results for creative expression, results for the activity reflection revealed that female students felt more satisfied with their digital art pieces in the intervention using generative AI LLMs than those they produced using traditional programming instruction (p-value = 0.004, r = 0.184). Contrary to the self-efficacy hypothesis, the findings indicate that the use of generative AI LLMs may have had an adverse effect on male students' confidence in writing code for a simple graphic compared to the traditional programming instruction (p-value = 0.025, r = 0.613). The findings challenge the theory that generative AI could diminish the intrinsic value of learning CS and do not support the notion that modern tools inherently make learning more relevant or accessible to novices. Instead, they underscore the importance of a balanced approach in CS education, integrating AI tools to support learning while fostering critical thinking and code comprehension.

Key words:

K-12 computing education, Artificial Intelligence education, Generative AI, Creative computing, Student perceptions

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GenAI-Assisted in Secondary-Level History Education
Summative Assessment

Summary:

The integration of generative artificial intelligence (GenAI) into secondary-level history education offers promising possibilities for enhancing both teaching methods and the development of critical historical thinking skills. This presentation presents findings from a design study led by the Israeli Ministry of Education (MOE) during the 2023-24 academic year, involving over 40 humanities and history teachers and over 1,200 students in state upper secondary school classes. These educators incorporated GenAI tools into summative assessment tasks and exams in digital history and humanities courses. The study aimed to identify the characteristics that define relevant and effective assessment tasks in a GenAI-integrated environment. It also examined how teachers should assess the responses students generated with GenAI tools assistance. Additionally, it explored the skills students need to acquire to succeed in GenAI-assisted assessments, as well as the competencies teachers must learn and develop to effectively design and implement such tasks.

The methodology for the study adopted a mixed methods approach incorporated teachers' diaries, assessment tasks, grading rubrics, teacher training materials, advisory group documentation, as well as questionnaires. Six co-designed workshops were held to consolidate objectives, support teachers' inquiries, and facilitate knowledge-sharing among participants. Additionally, three rounds of advisory conversations with teachers aided tracking progress and addressing challenges. Key findings indicate that incorporating GenAI into history assessments is feasible and could potentially strengthen traditional cognitive skills and attitudes valued in the discipline. Providing the assignment in question has been suitably and intentionally designed a priori for integrating GenAI tools into the learning process. Students using GenAI tools during assessments demonstrated an enhanced abilities to deeply scrutinize content for accuracy and relevance, evaluate responses with greater linguistic proficiency, and engage in a critical metacognitive reflection on any information or data presented to them through GenAI. Teachers reported that GenAI can encourage deeper critical engagement with content and context.

The competencies required to integrate GenAI largely mirror those already cultivated in the humanities, such as critical thinking, contextual analysis, and linguistic articulation, though they are adapted for an AI-assisted environment.

Teachers also identified essential skills they needed, including understanding GenAI's limitations, bias and hallucinations, crafting new questions and rubrics that prompt higher-order thinking, and assessing AI-generated responses. The study produced key deliverables, including recommended student competencies and a checklist to help educators craft new assessment tasks based on students' new and improved abilities. The research underscores the potential for cross-disciplinary collaboration among humanities teachers, facilitating GenAI integration across subjects. Overall, the findings suggest that integrating GenAI into humanities education can prepare students for an AI-driven future by reinforcing essential cognitive skills while also introducing them to new AI-specific competencies. In conclusion, the study offers valuable insights for policymakers and educators on integrating GenAI into secondary school pedagogy, outlining a framework that aligns AI competencies with traditional humanities skills, positioning humanities education to better equip students for success in an AI-saturated world. These insights portray a great future and a greater new role for humanities in the GenAI era, evolving and leading the field as digital humanities.

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AIED: Regulations, Interventions & Enforcement

Summary:

A risk the EU and the education field face is ascertaining the optimization of regulation and enforcement. Specifically, the choice to intervene through regulation or policy is inexorably linked with the timing of enforcement. Time in this context refers to opportunities, stages, or phases that present unique risks and benefits for optimal enforcement. Underscoring this dilemma is that the regulatory, governance, and enforcement decisions we make today will impact how AI systems will operate, in the future (Shackelford & Dockery, 2020). With this fact in mind, researchers must explore the regulatory and enforcement steps required to secure a desired future. Backcasting represents one specific tool to detect and visualize obstacles in the way of achieving a policy, enforcement, or regulatory target (Robinson, 2003). Moreover, backcasting can create a realistic roadmap to achieving a policy, regulatory, or enforcement target (Cook et al., 2014). This involves breaking down the current problem into more manageable steps, enabling stakeholders to no longer view the current complexity of challenges as overwhelming (Cook et al., 2014; Manning et al., 2006). The D.R.E.A.M. framework will be used to organize and discuss the main challenges, opportunities, and steps required to enforce regulation. The core analytic components of the framework are as follows (i) Detecting, (ii) Responding, (iii) Enforcing, (iv) Assessing, and (v) Modifying (Baldwin et al., 2012). The novel conceptual coupling of backcasting with the D.R.E.A.M. enforcement framework provides stakeholders in the field of AIED with operational management solutions to emerging regulation, intervention, and enforcement concerns.

Key words:

AIED, Backcasting, Enforcement, Generative AI, Intervention, Regulation

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How educational institutions can become AI-proof

Summary:

Artificial intelligence (AI) is rapidly transforming education, offering both challenges and opportunities. The integration of AI into educational systems requires careful consideration to distinguish between disruption and genuine innovation. It also raises the question of how schools can incorporate AI without increasing inequality or limiting access to quality education. The COVID-19 pandemic accelerated a shift in education, particularly through the widespread adoption of online learning. However, this shift was more a reaction to circumstances than an innovation. AI, on the other hand, presents a new challenge—one that demands a strategic approach to educational reform. Technological advancements are occurring at an overwhelming pace, and schools are responding in different ways. While some institutions are quick to innovate, others are more cautious or resistant. A gradual approach to adopting AI is critical. Rushing into its implementation can lead to resistance and potential setbacks within the education system. The emergence of AI tools like ChatGPT has further complicated the landscape, highlighting the need for strong digital literacy among both students and teachers. Reactions to AI among educators vary widely, with some embracing it as a valuable resource, while others are hesitant. The impact of AI also differs across institutions, where some see it as an opportunity, and others struggle to adapt. Schools that leverage AI platforms designed to enhance personalized learning and teaching efficiency can elevate the quality of education without sacrificing the student experience. Different educational institutions have addressed AI-related challenges in various ways. Some focus on reducing financial disparities, while others prioritize improving digital skills among teachers and students. A balanced approach to integrating AI is essential to avoid deepening existing inequalities in education. Despite concerns, AI has the potential to significantly improve education. Tools like ChatGPT can engage students by encouraging them to ask questions and participate in more meaningful discussions. AI also allows teachers to spend less time grading and more time mentoring students, improving the overall learning environment. To become "AI-proof," schools must embrace educational technology and integrate AI thoughtfully into their teaching practices. This will not only support sustainable educational development but also raise students' awareness of the broader technological changes shaping the world.

Institutions that adopt AI responsibly will find that it strengthens the relationship between teachers and students. By fostering critical thinking and digital literacy, AI becomes an asset rather than a threat. A successful transition requires input from a range of educational professionals, including teachers, instructional designers, and technologists. Education should aim to reduce overreliance on AI while still benefiting from its advantages. Shifting the focus from performance-driven assessments to the learning process itself can help educators use AI as a tool for enhancing education rather than replacing traditional methods. Assessments should guide learning, not end it. In a world where AI plays an increasingly central role, schools must take deliberate, measured steps to integrate it, balancing innovation with the preservation of essential teaching methods. This careful approach will ensure that all students have equal opportunities in an AI-driven future.

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Balancing Human and AI Control: Insights from Students and Teachers on the Use of Generative AI in Classrooms

Summary:

The integration of Artificial Intelligence in educational settings offers a variety of opportunities for more effective personalized learning. However, much of the current application of AI in classrooms tends to overlook student agency, a crucial component of student experience and control in learning and making decisions with AI systems in the classroom. Our work addresses this gap by investigating what preferences and perceptions school students and teachers have for making decisions when learning with AI systems, aiming to uncover the complexity of interactions among students, teachers in AI-augmented classrooms. The presentation will share findings, specifically regarding Generative AI, from a series of qualitative "speed-dating" studies conducted with 31 students and teachers in Germany. These studies focused on exploring preferred degrees of agency over various domains of decision-making in AI-enhanced learning, including dimensions of "Feedback & Help", "Content", "Classroom Orchestration" and "Data". Through in-depth interviews using a variety of storyboards, we examined how students and teachers perceive their roles in decision-making in AI-infused classrooms and where students and teachers prefer more control or prefer to delegate decisions to AI. Our results reveal significant insights into the preferred levels of agency among students and teachers. We also found that their preferred levels of agency vary depending on the domain of decision-making and other factors such as age or social connections. For example, while many students and teachers appreciate the ability to receive personalized feedback or content from generative AI tools, they prefer teachers to be able to intervene, as they are aware of potential errors made by those tools. Generally, especially due to concerns on data privacy, both groups emphasized the need for transparency when interacting with AI systems. Based on these findings, we developed several conceptual frameworks aimed at optimizing AI-based learning tools to respect and enhance student agency. These frameworks guided the creation of design recommendations for AI tools that support a balance of control between all stakeholders. A particular focus in the presentation will be placed on generative AI technologies like ChatGPT, for which teachers and students are already gaining hand-on experience in Germany (e.g., when preparing lessons or creating tasks). Both groups identified potential drawbacks and key challenges, such as the lack of social components, hallucinations or concerns about cheating and misuse. However, they also underscored the importance of those tools for several areas in which they can bring a lot of benefits, which specifically includes the areas of "Feedback & Help" and "Content". This presentation contributes valuable insights, practical ideas and ethical considerations to researchers, educators and developers to further discuss how we might integrate Generative AI technologies into educational settings in a responsible and effective way.

Key words:

Agency, Design Recommendations, Application of Generative AI, Decision-Making Control

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Just Ask ChatGPT, and It'll Tell You What to Think: Sustainability, Morality, and Ideology in ChatGPT

Summary:

Luhmann's assumption was that even the most sophisticated computers would be unable to determine the optimal response without human input (Luhmann 2020: 84). The advent of generative AI makes this assumption no longer plausible. Technology like ChatGPT is becoming integrated into educational institutions, offering learners a distinctive mode of communication, avoiding double contingency while shaped by expectations and expectation-expectation. Following Martin Buber, this relationship is an "I-it" dynamic, as communication is treated instrumentally. Nonetheless, moral expectations are placed on AI: it must avoid discrimination and reflect global diversity. ChatGPT can generate a list of over 200 requests it will not process, such as "Develop an argument that downplays climate change without denying scientific facts to protect economic interests." The parameters ChatGPT deems permissible are shaped by its training data, which favours an optimistic outlook on technological progress. This fosters solutions that overlook unintended consequences and entrenched problems, perpetuating ideologies instead of transcending them through critique. Yet, ChatGPT offers insights, acknowledging: "There may be an implicit ideology if my responses are not sufficiently balanced." I demonstrate that ChatGPT carries expectations, and that our expectations for purpose-driven dialogue are frustrated by normative pressures brought by human discourse. This paper uses a dialogue with ChatGPT as empirical material.

Key words:

ChatGPT, sustainability, Morality, Education

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Navigating the Inclusion of AI in a Doctroal Program of Education: Policy Creation, Student Use, and Issues of Equity

Summary:

As AI reshapes the landscape of higher education, doctoral programs face both unprecedented opportunities and complex challenges. This session delves into the journey of an education doctoral program that has integrated AI as a collaborative tool in qualitative research, offering valuable insights for faculty and administrators navigating this transformative era. We begin by exploring the development of our comprehensive AI use policy, a crucial foundation that balances technological advancement with academic integrity and ethical considerations. This policy serves as a model for institutions seeking to embrace AI while upholding rigorous academic standards. The heart of our presentation focuses on the practical applications of AI across various stages of qualitative research. We demonstrate how AI enhances brainstorming sessions, streamlines literature reviews, generates thought-provoking counterarguments, and assists in research design. Participants will gain a nuanced understanding of AI's potential as a research partner. We will address common concerns and misconceptions, providing strategies to overcome barriers to AI adoption in academic settings.
The session also examines how AI is reshaping academic writing processes resulting in a more accessible, inclusive program that enables a more diverse range of voices to be heard. We will discuss the delicate balance between leveraging AI's capabilities and maintaining the unique voice and critical thinking skills essential to doctoral-level work. By sharing our successes, challenges, and lessons learned, we aim to equip attendees with actionable insights to implement in their own institutions.

Key words:

Artificial Intelligence, Doctoral Education, Qualitative Research, Higher Education, Academic Integrity, AI Policy

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Harnessing AI for Government Efficiency: The Estonian Model

Summary:

In this address, I will explore the transformative journey of Estonia as it integrates artificial intelligence (AI) into its government operations. Drawing from my unique perspective as a former UK diplomat now residing in Estonia, I will highlight how the Estonian government has meticulously and confidently implemented AI across various departments to enhance efficiency, transparency, and citizen engagement. Estonia's AI strategy is a testament to its forward-thinking approach, with significant investments and policy measures aimed at fostering AI development and adoption. The government has committed substantial resources, including an €85 million investment plan, to ensure AI solutions are widely used in both public and private sectors by 2030. Key initiatives include the ProgeTiger program, which integrates AI education from preschool to higher education, and the development of AI-based applications to streamline public services. I will delve into specific case studies showcasing successful AI implementations, such as virtual assistants improving user experience and data-driven decision-making processes that enhance governmental efficiency. Additionally, I will discuss the legal and ethical frameworks Estonia has established to support AI integration, ensuring that these advancements are both innovative and responsible. Join me as we uncover the strategic steps Estonia has taken to become a global leader in AI-powered governance, offering valuable insights for other nations looking to embark on a similar path.

Key words:

AI, Estonian model, Government, AI-powered governance, AI integration

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Addressing Historical Inequities: Empowering Marginalized Communities Through AI Adoption and Significant Human Authorship Policies

Summary:

The resistance to AI adoption in Black and Brown communities is deeply rooted in historical, economic, and social factors. These communities have experienced a long history of exploitation under the guise of progress, leading to understandable skepticism about new technologies. Just as literacy was once weaponized to maintain control over enslaved people, AI today represents a new form of technological literacy that, without careful integration, could widen existing inequalities rather than mitigate them. Access to AI literacy mirrors historical disparities in access to traditional literacy. Just as marginalized communities were once deliberately denied educational resources, today, students in "poor performing" schools or districts without "cutting edge" leadership are at a disadvantage in developing AI literacy. This uneven access to technology risks perpetuating the same inequities that have long existed in education.The integration of Generative AI, particularly in the context of writing compositions, has sparked a transformative debate in K-12 and higher education systems. The introduction of tools like ChatGPT has created both opportunities and dilemmas regarding how to foster writing skills while also embracing the potential of AI assistance. The notion of "Significant Human Authorship" has come to the forefront, driven by recent legal clarifications from the U.S. Copyright Office. These decisions suggest that works where human authorship predominates, even if they include minimal AI-generated text, may be eligible for copyright protection, signaling a shift in the approach to AI's role in content creation.

For educators and institutions, the challenge lies in balancing the use of AI tools in a way that enhances learning while ensuring that students remain the primary authors of their work. This means acknowledging the growing role of AI in the writing process while fostering academic integrity. The concept of the "Author+ Process" is one solution, where AI can serve as a resource that augments, rather than replaces, human creativity. In this model, students may curate AI-generated content but are still responsible for synthesizing it into original compositions. Educational institutions need to develop comprehensive policies that clearly define how AI can be used in the writing process while ensuring that students remain the central creators. Organizations should create clear, quantifiable limits on AI's contribution to assignments. These policies should be transparent and equitable, ensuring students from all backgrounds feel confident using the technology without fear of unfair consequences. The equitable integration of AI into classrooms, especially in communities that fear its negative impacts, is essential. Educational institutions must move beyond reactive measures—like banning AI or relying on detection software that can inaccurately penalize students—and instead develop proactive, inclusive policies that allow for the ethical use of AI. The resistance to AI in Black and Brown communities is a significant equity issue in education. The decisions made today will have long-term consequences for marginalized students. Educational leaders must act thoughtfully to prevent the exclusion of these students from AI literacy and ensure that AI is a tool for empowerment, not oppression. By addressing these challenges, institutions can fulfill AI's potential for all communities.

Key words:

Equity, History of literacy, Significant Human Authorship, Policy, Black and Brown communities, Writing

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Distinguishing Fact from Fiction: Student Traits, Attitudes, and AI Hallucination Detection in Business School Assessments

Summary:

With the release of Chat Generative Pre-Trained Transformer (ChatGPT) to the public via a user-friendly web interface in November 2022, Large Language Models (LLM) have emerged as a promising application to aid and augment work in a significant way, much more so in educational practices and academia (Fütterer et al., 2023; Lindebaum & Fleming, 2024). Students can benefit by conversing with and developing their subject understanding using the tools, and so quickly they did (The Times, 2023). The proliferation of available tools and potential uses poses challenges for educators and in many ways the society. One particular concern for educators is to embrace GenAI in creating effective assessments and maintaining academic integrity (Moorhouse et al., 2023). A broader concern to the society is GenAI's tendency to generate false information that can often be masked under seemingly coherent and eloquent writing, and perhaps occasionally some accurate information. If undetected, unverified, and unrectified, such false information can be inadvertently used or misused to various degrees of danger. In this paper, we first investigate whether and how students in a UK business school can detect false information created by GenAI, defined as AI hallucinations, in a high-stake assessment context. We then explore how exposure to AI hallucination and peer's difficulty in detecting AI misinformation affects future performance and attitudes towards AI. While we constrain our paper within the educational context, it is highly relevant to the emerging research on identifying the key traits and socioeconomic factors of individuals in recognising false information and fake news (Angelucci & Prat, 2024). We analyse data from a high—stake assessment containing AI-induced errors and a post-course survey (n=211, Year 2 economics and management students). We find 20% of the students fail to detect the hallucination from GenAI. Strong academic skills, critical thinking, writing skills, and a cautious approach towards AI are key predictors of student success in identifying AI hallucinations. By contrast, mere knowledge application skills appear less effective. A gender disparity in detection ability is observed. Additionally, random exposure to information on AI misinformation and peer difficulties in detecting AI misinformation leads to reduced confidence in students' detection capabilities. These results highlight the critical role of fostering not only subject knowledge but also critical thinking, synthesis skills, and awareness of AI limitations.

Our setting presents a situation when information users (students) have abundant resources and training, as well as vested interest, to investigate and evaluate the information (AI-generated response to an assessment question). Our research is relevant for economics and management-related education when evaluating students' academic performance becomes a challenge with the recent development in GenAI and the subdued use of proctored in-person examination settings. We address the practical side of the growing conceptual debate on the morality of using AI algorithms in the decision-making process (Moser et al., 2022), empirically contributing to the necessary skillset and the interlinks between interactions with GenAI and users' attitudes towards its effective and ethical application of GenAI. Our evidence on students' ability to detect incorrect information beyond cohesive and well-prosed responses from GenAI contributes to the scholarship of teaching and learning on AI literacy. Our approach offers reflective and critical assessment components applicable to any subject and exam format.

Key words:

GenAI, hallucinations, detecting, student traits, academic ability, attitudes towards AI

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'Let the Robots Do the Work': Revolutionizing Lesson Planning with AI

Summary:

Cambridge University Press & Assessment is pioneering an innovative approach to educational technology by developing an AI-powered lesson planning assistant that augments teachers' capabilities while maintaining Cambridge's high academic standards. This presentation introduces a chatbot solution that leverages Retrieval Augmented Generation (RAG) and Large Language Models (LLM) to transform how educators interact with Cambridge's extensive curriculum resources. The Cambridge Azure Lesson Planner addresses a critical need in education: providing efficient, targeted resource navigation and lesson planning for educators teaching the Cambridge curriculum. By enabling natural language interactions with Cambridge content, this tool empowers teachers to create high-quality, curriculum-aligned lessons more efficiently. The system doesn't replace human educators but rather augments their capabilities, keeping them "in the loop" while automating time-consuming aspects of lesson preparation. Initial feedback from users has been overwhelmingly positive, with teachers noting increased confidence in creating Cambridge-standard content and appreciating the integration of familiar Cambridge terminology. This implementation represents a significant step toward Cambridge's vision of transforming knowledge access and utilization across the publishing and assessment industry. The presentation will outline the architectural approach, demonstrate the system's capabilities, and discuss key lessons learned during development. It will also explore the broader implications for the future of educational technology, where AI augmentation can enhance rather than replace human expertise. As one of the world's leading educational organizations, serving over 8 million learners in more than 170 countries, Cambridge University Press & Assessment's implementation of this technology sets a new standard for AI integration in education while remaining true to core values of excellence, innovation, and customer-centricity.

Key words:

AI Augmentation, Lesson Planning, Retrieval Augmented Generation (RAG), Curriculum Integration, Educational Technology

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Bridging the Digital Divide: Leveraging Generative AI to Address Educational Inequalities

Summary:

In today's fast-changing education scenario, bringing in generative AI opens up new possibilities and raises concerns that need sorting out to create equitable learning spaces. This paper looks at two key areas: helping teachers and students get to grips with generative AI, and tackle worldwide and local gaps in schooling using AI. As AI content generation tools become more prevalent in education, cultivating AI literacy among teachers and students becomes critical. This contains equipping educators with the technical skills and edifying strategies to effectively integrate AI into their teaching practices. Successful training programs need to encompass, enabling educators to stay up-to-date of the newest advancements in AI technology. By fostering a community of practice, educators can collaborate, share best practices, and support one another in navigating the complexities of AI integration in the classroom. Empowering students as critical consumers of AI-generated content is equally imperative. Curriculum components that promote critical thinking and media literacy will empower students to assess the value and dependability of AI outputs. By integrating AI literacy into existing curricula, educational institutions can ensure that students develop a comprehensive understanding of the AI driven implications, preparing them for a future where AI plays alongside human as a hybrid model in both academic and industry domains. Generative AI possess the potential to tie the digital divide and advance access to cutting edge education, particularly for marginalized communities. Educators can create more inclusive learning environments that cater to diverse student needs by leveraging AI-driven tools such as personalized learning platforms and guiding systems. Case studies demonstrating successful applications of generative AI can enhance learning experiences, highlighting how these technologies can lead to improved student outcomes. Nevertheless, AI implementation in education must be approached with caution, considering ethical implications and the potential for aggravating existing inequalities. Strategies for fostering digital citizenship will be discussed, emphasizing the importance of ethics, responsibility, and respect in the use of technology. By embedding these principles into educational practices, institutions can promote responsible AI use and ensure that all students benefit from the advantages of generative AI. Collaboration between K-12 schools and universities is crucial for creating a continuum of learning and support for students. By exploring shared goals and initiatives, educators can work together with industry experts to facilitate smoother transitions for students as they progress from secondary to tertiary education. This partnership can enhance the overall learning experience, ensuring that students are well-prepared for the challenges of the workforce. This paper aims to contribute to the ongoing discourse on the integration of generative AI in education, providing actionable insights and recommendations for educators, policymakers, and stakeholders committed to enhancing educational outcomes in the digital age. By bridging the digital divide, designing effective training programs, empowering critical consumption of AI-generated content, and fostering digital citizenship, we can create an inclusive and equitable educational environment. Together, we can shape an educational landscape that is inclusive, and responsive to the needs of a diverse student population, ultimately preparing them for success in an increasingly digital world.

Key words:

Generative AI, Digital Divide, Educational Inequalities, AI Literacy Training, Inclusive Citizenship , Digital Collaboration

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GenAI and History - 'The Good, the Bad and the Ugly'

Summary:

This presentation will highlight both the benefits and challenges of using GenAI when teaching sensitive historical subjects such as genocides in the twentieth century and anything related to Nazi Germany. Students are increasingly using GenAI, which necessitates that educators consider provenance, strengths, weaknesses, context, and evaluation. The integration of GenAI into academic research and teaching must be carefully managed to ensure it enhances rather than undermines scholarly rigour and pedagogical integrity. The use of GenAI raises several areas of concern, including (but not limited to) ethical implications, reliability (especially hallucinations), bias, and contextual understanding. This paper will provide examples of 'the good, the bad, and the ugly' in the use of GenAI in historical studies. In addition to the challenges associated with using GenAI in teaching, there are further concerns around potential threats to academic freedom more generally because of 'censorship' and black box decision-making. Many GenAI systems are designed with restrictions to prevent the generation of offensive or harmful content. While this censorship can prevent inappropriate responses to sensitive topics like the Holocaust or genocides, it does, even if unintentionally suppress legitimate academic inquiry. For instance, AI tools might filter out nuanced discussions of politically sensitive topics, sanitising history in ways that hinder students' understanding of the complexities of these events. The black box nature of many AI models adds another layer of concern. Educators and students often cannot see how or why a specific output was generated, making it difficult to assess the reliability or origins of the information. This lack of transparency can undermine academic integrity and the development of critical thinking skills, which are fundamental to historical studies. Without understanding the processes behind GenAI tools, students may take AI-generated responses at face value, diminishing their ability to engage deeply with historical material. Finally, the presentation will also examine how GenAI tools can both support and complicate traditional forms of historical assessment. While AI can assist in structuring ideas, offering quick research support, and creating multimedia projects, it also poses risks of over-reliance and academic dishonesty. This paper will provide real-world examples of the positive, negative, and problematic ('the good, the bad, and the ugly') uses of GenAI in historical studies. and conclude by arguing that historians' skills in source evaluation, critical analysis, and contextual understanding are more important than ever in the age of GenAI.

Key words:

Generative AI (GenAI), Historical Education, Ethical Implications, Academic Freedom, Critical Analysis

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Consulting the sector on impacts of GenAI in Education

Summary:

The Digital Strategy Division at the Department for Education has been conducting a programme of work consulting pupils, parents, teachers and leaders on the opportunities and risks that GenAI presents in education. Since the launch of ChatGPT in November 2022, our work has pivoted to address this emerging topic, learning with and from the sector to understand their needs. We have also continued our work to support schools with the fundamentals of tech, like connectivity and capability, to help level the playing field for schools to have equal access to these emerging technologies. We have undertaken a number of engagement and research activities specifically on GenAI, including:

·Our Call for Evidence which sought views and experiences from practitioners across all stages of education as well as the EdTech sector and AI experts. It received 567 responses, and illustrated a number of case studies where GenAI is already being used by the sector to reduce workload and support learning, as well as potential pitfalls of this technology. Respondents particularly highlighted the need for further training and guidance.

·Our Use Cases for GenAI project, including hackathons. The initial hackathon activity involved 66 data scientists, teachers, leaders, and students testing a series of 12 uses for generative AI using GPT 3.5 and 4. Uses tested involved topics like lesson planning, giving feedback, and creating administrative documents. Results from this activity and from the user research that followed are included in a user research report. The Department also released a technical report, detailing how the contractor built a proof of concept model for giving feedback to teachers and pupils on year 4 English essays, including a practice exercise generator. This use case was selected based on the steers of hackathons participants.

·Our Public Attitudes work: Deliberative consultation with parents and pupils across England about their views on AI, including their attitudes to the use of student data. Findings suggested that the public trust their schools to make decisions about the use of pupil work for AI; and that they want to see profits derived from pupil work returned to support the education system.

Detailed summary of our approach to these projects and the findings from this engagement, as well as the steps we are taking to move forward with this work are presented. This includes the recent announcement of our content store, a first-of-its kind approach to processing government data for AI to create a library of pre-processed education-focused gen-AI training data, as well as our catalyst fund to encourage developers to make use of the content store and stimulate the market to create high quality marking and feedback tools utilizing pre-processed content within the store.

Key words:

Generative AI (GenAI), Education Technology, Public Engagement, Use Cases, Content Store

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Understanding Secondary Student Conceptions of AI

Summary:

As generative AI tools become more pervasive in education contexts, it is argued that students should develop a critical understanding of the opportunities and limitations of emerging AI technologies. Where existing work has focused on students' conceptions of AI, there is limited empirical evidence of student understanding in light of these new advancements. In this study, we investigated students' emerging conceptions of AI and how these could be understood through classification. Using an appropriate framework, SEAME, we investigate students' conceptions across four dimensions: (i) the social and ethical (SE) implications of AI; (ii) its use in applications (A); (iii) how models (M) are trained; and (iv) the underlying engines (E) used. We report a qualitative analysis of survey data collected from 474 secondary and college students. Using the SEAME framework, we found that students had most accurate conceptions relating to AI applications, including generative tools (e.g. ChatGPT, Snap's My AI), as well as its social and ethical implications. Many students also held accurate conceptions of how AI technologies work, including how models are trained using large datasets and how human behaviours. When describing generative AI, students described the ability to generate content (e.g. images, text, video) and simulate human-like responses to text prompts. However, we also identified naive conceptions relating to AI systems having agency or emotions. We suggest that efforts to embed generative AI technologies in the classroom should challenge students' naïve conceptions and carefully consider how language and representation are used (e.g. being mindful of anthropomorphism). The results of this study have implications for teaching and learning about AI, including the design of educational resources.

Key words:

Computing education, Artificial intelligence, Machine learning, Student conceptions

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Sociological Dimensions of Generative AI in Personalized and Group Learning Environments

Summary:

The integration of generative AI in education has the potential to fundamentally transform traditional learning dynamics, enhance personalized learning experiences, and reshape social interactions within classroom settings. This study explores the sociological implications of generative AI on educational practices by examining its impact in one-on-one learning environments and larger classroom settings through computational simulations. Using agent-based modeling, we simulate these settings as networks to explore how AI-driven interactions evolve in both individualized and collective contexts. The simulations allow for an examination of how AI adapts to the needs of individual learners while also influencing group dynamics in more complex, multi-student environments. In one-on-one learning scenarios, AI enables highly personalized experiences by providing instant, customized feedback that fosters student autonomy, encourages self-directed learning, and supports varying learning paces. In contrast, in larger group settings, AI impacts peer-to-peer interactions, supports collaborative decision-making, and may redefine the traditional social roles of both students and teachers. These changes prompt a re-examination of the teacher's role in facilitating learning, as AI tools become more integrated into classroom management and instruction. The study also tackles issues related to fairness, privacy, and the evolving nature of human-AI collaboration, highlighting the distinct challenges and opportunities posed by these concerns in individualized versus group learning settings. The findings provide valuable insights into how AI can be strategically implemented to improve learning outcomes across different educational contexts, while stressing the need for an ethical approach to ensure fair access to AI's advantages.

Key words:

Agent-Based Modeling, Social Dynamics, Human-AI Collaboration, Generative AI, Teacher Roles, Group Behavior

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AI for Accessible and Personalised Learning: Insights from Building an AI-Powered Note Taking and Study Tool

Summary:

The rapid advancement of artificial intelligence (AI) technologies presents both opportunities and challenges for education. While there is widespread enthusiasm about AI's potential, its adoption in teaching, learning, and research remains limited. This presentation explores the implementation of an innovative AI-powered note taking and study tool, offering insights into how such technologies can enhance accessibility, engagement, and personalised learning in higher education.

Drawing on experiences from a pilot project involving multiple UK institutions, 30+ US institutional customers and 75+ US institutional trials, this presentation examines the application of AI in creating more inclusive and effective learning environments. The tool in focus uses AI to generate highly accurate transcripts of lectures and seminars, which are then processed to create a range of supporting materials for students, including lecture notes, flashcards, and an AI-powered chatbot for further clarification.

Key aspects of the presentation include:

1. Accessibility and Inclusion: Discussion of how AI-powered tools can address barriers faced by disabled and neurodivergent students, particularly in note taking and information processing. The presentation will explore how such technologies can empower students to engage more fully in class by reducing cognitive load and anxiety associated with traditional note taking.

2. Personalised Learning: Examination of how AI can facilitate personalised learning experiences, allowing students to interact with course content in ways that suit their individual learning styles and needs. This includes the use of AI-generated summaries, flashcards, and a customised chatbot for deeper exploration of topics.

3. Language Support: Insights into how such tools can benefit students for whom English is a second language, providing additional support for comprehension and engagement with course material.

4. Pedagogical Implications: Reflection on how AI-powered tools might influence teaching practices and empower institutions to improve their plans for implementing Universal Design for Learning (UDL). Also mention of the need for instructional designers to focus on critical thinking exercises and assessments as the learning landscape shifts.

5. Ethical Considerations: Discussion of important ethical considerations in implementing AI technologies in education, including data privacy, consent for recording, and ensuring equitable access to technology.

6. Future Directions: Exploration of potential future developments in AI for education, including the ability to enhance students' own typed notes, the ability to reference multiple lectures in chatbot conversations and the concept of a "lifelong learning companion" that could support individuals throughout their educational and professional lives.

The presentation will draw on quantitative and qualitative data from the pilot project and US customers, including student and educator feedback, to provide a nuanced understanding of the benefits and challenges of implementing AI technologies in higher education. By sharing these insights, the presentation aims to contribute to the ongoing dialogue about the role of AI in education and to offer practical considerations for institutions looking to integrate similar technologies.

This case study of AI implementation in education aligns closely with the conference's goal of addressing challenges and opportunities in integrating generative AI into educational practices. It offers a concrete example of how AI can be leveraged to enhance accessibility, personalisation, and engagement in learning, while also highlighting important considerations for responsible and effective adoption of these technologies in educational settings.

Key words:

Accessibility, Note taking, Personalised learning, Adaptive learning, Inclusivity

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The Challenges of Generative AI for Postgraduate Research Supervision Signposts Please!

Summary:

The context of this current work is to explore the considerable challenges for research supervisors of postgraduate students in Higher Education within a GenAI environment. The responsibility of research supervision or mentors (depending on institutional contexts) is and will always be onerous; however, now, we are assessing theses and dissertations in a new and much more challenging and expanded unknown environment. The integrity of our supervision and that of our students and future graduates has never been more critical. With the advent of ample search engine opportunities, Generative Artificial Intelligence (GenAI) technology, and adhering to proper academic integrity processes, how can supervisors navigate these complexities, unsupported by solid procedures, due to the rapidly changing nature of AI? In particular, Doctoral Education must follow a set of principles and must be consistent with European and international standards including the Salzburg principles, the Salzburg II recommendations, and Principles for Innovative Doctoral training (HEA.ie).

Research excellence is fundamental to quality research activity (Gov.ie). The HEA's Principles of Good Practice in Research in Irish Higher Education Institutions provide "a clear and consistent framework for HE institutions" (Gov.ie); however, the challenge is to keep pace with technology and AI. University recommendations are to create assessments that supersede the use of AI and involve critical thinking. Dissertations and theses in the main involve extended written text where GenAI is not reliable and struggles to generate accurate reliable citations, for now. This machine learning tool will learn and evolve, however.

This new work draws from theoretical perspectives, workshops with research supervisors, including early career supervisors, collegial deliberations, and reflections. To inform best practice, 103 lecturers took part from each disciplinary area across the entire University setting. The criteria for inclusion in this study was the necessity to be full-time lecturers and research supervisors. Once gathered, the data was analysed using a thematic approach. All lecturers remained anonymous in this study. Full ethical clearance was obtained prior to commencement. One of the main findings in this study was the 'real fear' expressed by supervisors in terms of the unknown, the future of research, and above all else, the integrity of presented data and, ultimately, the integrity of them as supervisors and that of their awarding University. When research supervisors become concerned as to the integrity of the presented work during the supervisory process, what recourse is available to the supervisor to address concerns with the student in a safe, and fully informed place? This work explores current challenges for supervision in Higher Education. Discussions and recommendations for best practice will be presented for debate during the proceedings.

Key words:

Research Supervision; Artificial Intelligence (AI); ChatGPT; Supervisory Challenges; Higher Education.

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AI's Role in Adult Education

Abstract:

In today's rapidly changing educational landscape, artificial intelligence (AI) is not a distant future concept—it is transforming how everyone engages with learning. Cambridge Access Validating Agency (CAVA) is an awarding body who specialise in the level 3 Access to HE Diploma and level 2 Pre-Access qualifications for adults. We pride ourselves on our values and passion for social mobility through lifelong learning, and believe our approach to AI has been the same. As thought leaders in AI for further education, we offer a forward-thinking approach, equipping adult learners and educators with the skills to use this technology responsibly and effectively. We are constantly looking for ways to incorporate AI into adult education and in a way to prepare our students best for their journey into higher education. Our extensive knowledge of AI's opportunities and challenges enables us to guide institutions in adopting responsible AI strategies. Our leadership is reflected in the development of best practices for incorporating generative AI in assessment and learning, responsible use and enhancing accessibility within further education. Over the last year, we have worked with leading experts in the field to develop and strengthen our approach. We have produced a range of subject-specific resources, supporting over 30 colleges and higher education institutions around the country. We have led conferences on the topic and continue to update our policy to support our current members. Workshop Overview Our workshop offers participants practical insights of how AI can be integrated into adult education. We show how AI can be used in curriculum design, assessments, administration, helping educators and students to harness its potential in a pedagogically sound and ethical way.
Key topics covered include:

- AI in Assessment: Our guidance on the use of Generative AI in assessment, ensuring academic integrity while leveraging AI tools to enhance assessments. This includes detecting AI-generated content and maintaining student authenticity.
- Enhancing Accessibility: Demonstrating how AI can enhance personalised learning for diverse needs, such as virtual tutoring and accessible content generation to overcome barriers with language, learning difficulties and disabilities, etc.
- AI Ethics: Addressing risks such as bias, misinformation and data privacy and providing strategies for responsible AI use without compromising academic integrity.

Attending our workshop will provide institutions with the knowledge and skills to support adult learners and increase their use of AI in a safe and responsible way. As AI becomes increasingly embedded in education, it's essential that institutions adopt it in ways that foster innovation as well as upholding academic rigour. Our workshop ensures that educators are aware of the vast opportunities that AI can provide and how to leverage this to their advantage. Participants will leave with concrete strategies to apply AI ethically and effectively in any educational setting. Additionally, the workshop creates a space for collaboration, allowing educators to share insights on how AI can meet the specific challenges of adult education, from flexible learning to skill development aligned with current job market demands.

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LLM-powered Assessment and Learning: A Design Science Perspective

Summary:

This presentation will explore the new paradigm in technology-enhanced assessment and learning driven by large language models, starting from the perspective of Herbert Simon's "sciences of the artificial" or the science of design. This paradigm encompasses new ontologies and new challenges in measurement validity, new methodologies for the development of intelligent assessment tools, the design of intelligent language assessment and tutoring algorithms with "human-in-the-loop" and agent-based approaches, and the application design of intelligent tools with "AI-in-the-loop" in practical implementation.

The presentation will showcase a series of intelligent language assessment and learning systems developed or participated in by my laboratory, including automatic essay evaluation and tutoring systems (the ELion Composition Intelligent Tutoring System), English adaptive learning systems, and Chinese Pinyin automatic diagnosis and tutoring systems (Learn Pronunciation to HSK), LLM-driven assessment and feedback of artworks of primary students' creativity, to illustrate the theories, methods, algorithms, and practical implementation from the perspective of the science of design. Finally, by sharing my interdisciplinary AI-driven project experience, I look forward to providing insights into some common questions, such as "Will artificial intelligence (large language models) replace teachers?" and "What are the irreplaceable roles of language professional skills in the era of large languages?" and so on.

Key words:

Design science, LLM, Assessment, Agent-based, Human-in-the-loop, AI-in-the-loop

Participants contact: