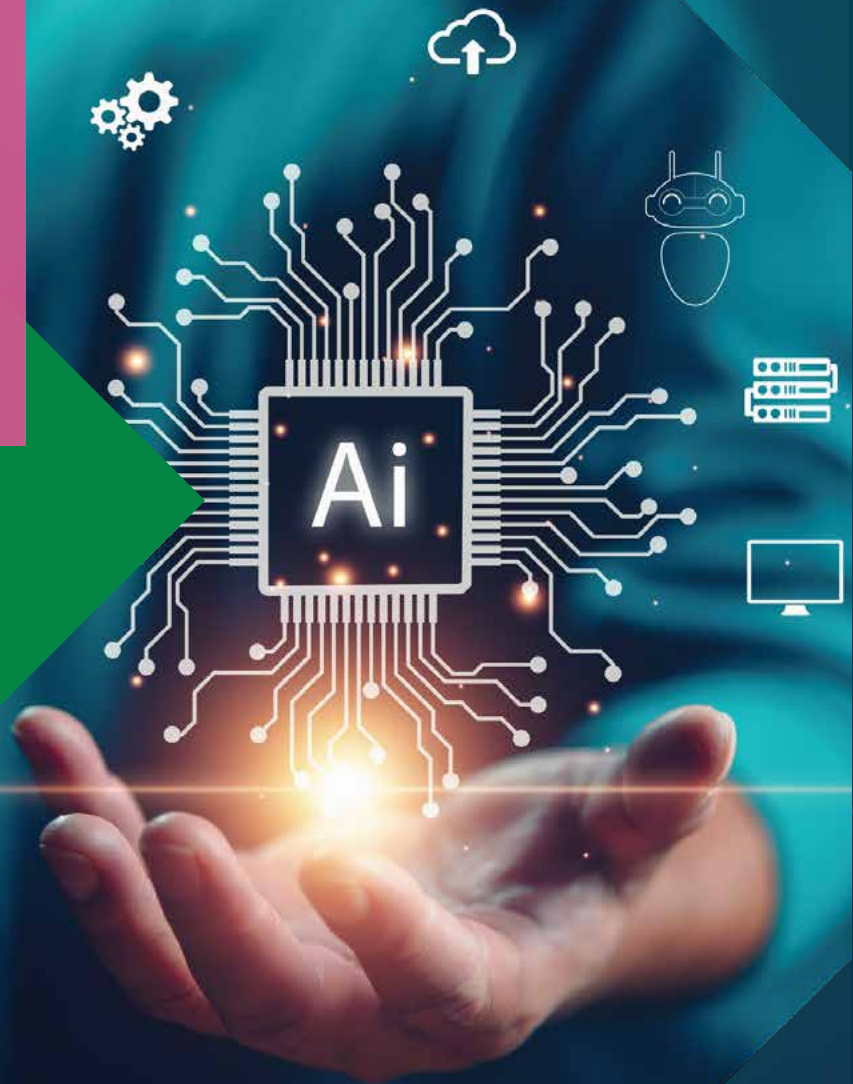


# Unlock the Future of Learning:

THE LATEST  
INSIGHTS INTO  
GENERATIVE AI



Engaging Content  
Engaging People



**LEARNOVATE**  
Leading Learning Innovation



# Introduction

## To learn more:

ADAPT - [www.adaptcentre.ie](http://www.adaptcentre.ie)

Learnovate - [www.learnovatecentre.org](http://www.learnovatecentre.org)

Artificial intelligence (AI) is a game-changing technology and its potential is vast. It is revolutionising the world of work and influencing global societies. It is against this backdrop of innovation that we focus on AI's potential in providing unrestricted access to information for all, shrinking equity and accessibility gaps, and supporting the work of educators.

Committed to digital leadership and an ethical future for AI, ADAPT, the SFI research centre for AI-driven digital content technology and the Learnovate Centre, have partnered to give the latest insights into generative AI and how it will transform the future of learning. By harnessing the power of cutting-edge technologies and AI, our research aims to deepen our understanding of learning across diverse cultures, ages, identities, and abilities, paving the way for enhancing the educational experiences of students, educators, and institutions.

We believe that driving advancements in educational technology to uplift learners from all walks of life demands an integrated approach, involving research, industry, and policy discussions. By illustrating the transformative potential of generative AI in reimagining and enhancing educational practices, we hope to present a world where no one is left behind.

This booklet spotlights pioneering research and developments in the field of generative AI, showcasing how these innovations can scale personalised learning and intelligently design learning environments that empower every learner to excel. Let this platform be the start of meaningful conversations where we come together to explore the next frontier in education.

“At ADAPT, we are committed to harnessing the transformative power of digital technologies to forge a future where innovation meets inclusivity. Our multidisciplinary, human-centric focus ensures that digital advancement benefits all, safeguarding democratic values and enhancing quality of life. Our researchers are passionate about shaping a world where digital technologies are a force for good, addressing pressing societal challenges with integrity and innovation.”

**Professor John D. Kelleher**

Director of ADAPT and Chair of Artificial Intelligence at Trinity College Dublin.



“Learnovate is at the cutting edge of research and innovation on the future of work and learning. Our industry led research is focused on moving towards more authentic learning experiences using Gen AI. We are excited at the possibilities and the positive impact that AI can have on education and learning.”



**Nessa McNiff**

Director of Learnovate

# Focus on Research

## Personalised Learning and Natural Language Interactions

Recent advances in large language models (LLMs) have revolutionised the capabilities of natural language processing (NLP). Researchers are harnessing these developments to create sophisticated applications, such as chatbot engines tailored for teacher training and enhancing student learning. These AI-driven tools are not only addressing complex language learning needs but are also equipped to analyse and respond to previously unseen learner interactions. This capability enables the prediction of student performance, the deployment of customised learning activities, and the provision of personalised feedback.

Professor Vinny Wade is a leading figure in the area of Computer Science and Artificial Intelligence, and the founding director of both ADAPT and Learnovate Centres. He has made significant contributions to research in web-based personalisation and AI-driven adaptive technologies with interests spanning knowledge and data-driven AI models, generative AI, and personalisation in digital media, with applications in education and healthcare.

His most recent research is responding to the growing demand for personalised education focusing on the role of chatbots and other generative AI applications in education's digital transformation.

# AI Technology Ethics within ADAPT's Research Programme

ADAPT researchers have identified a gap in societal expectations of AI and AI in practice, with the need to move from a performative to a truly effective AI ethical framework which recognises its limitations and the significant human labour it requires.

Effective AI ethics requires domain appropriate AI tools, updated professional practices and robust regulatory and accountability frameworks.

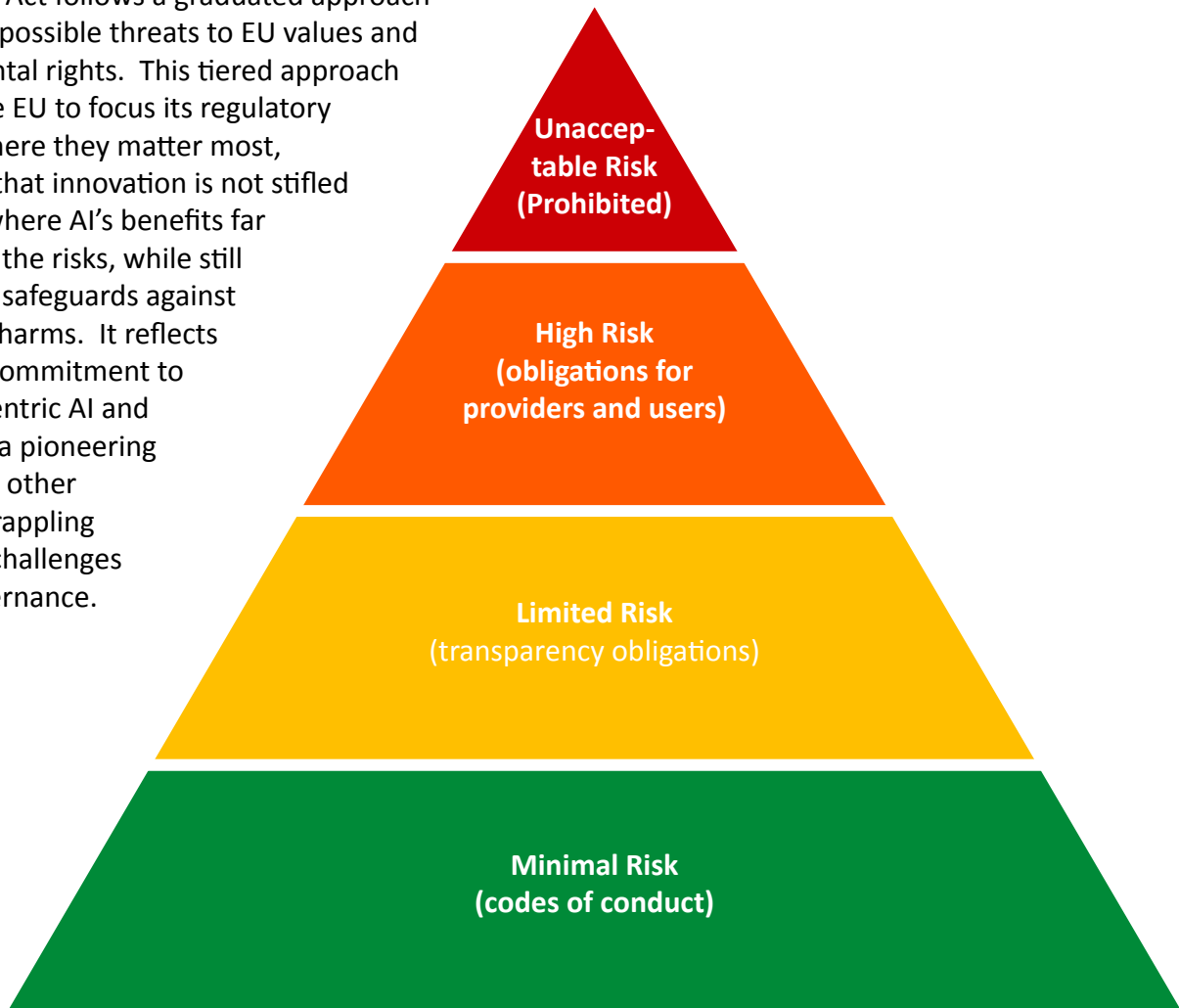
To further enhance ethical AI and data management within organisations, we recommend:

- engagement with governance and regulation;
- adoption of specific governance measures;
- monitoring and enforcement of those measures;
- and an iterative approach to updating measures.

[Click here to access the ADAPT Ethics Canvas](#)

# The EU AI Act's Risk-Based Approach to Regulating AI

The EU AI Act follows a graduated approach based on possible threats to EU values and fundamental rights. This tiered approach allows the EU to focus its regulatory efforts where they matter most, ensuring that innovation is not stifled in areas where AI's benefits far outweigh the risks, while still providing safeguards against potential harms. It reflects the EU's commitment to human-centric AI and serves as a pioneering model for other nations grappling with the challenges of AI governance.



# AI Risks in Education and Vocational Training

As AI systems are integrated into educational processes, understanding the associated risks and regulatory requirements is crucial. The AI Act categorises certain uses of AI in education and vocational training as high risk due to their significant impact on individual rights and opportunities. These include:

**Access and Admission:** AI systems that determine access to, or admission into, educational and vocational training institutions.

**Evaluation and Learning Outcomes:** AI systems used to assess students' learning outcomes, which may influence the direction of their further education.

**Level Assessment:** AI systems that decide the educational level appropriate for students within educational institutions.

**Behaviour Monitoring:** AI systems intended to monitor and detect prohibited behaviours during examinations.

Within these classifications, educational institutions planning to implement AI systems for assessment and monitoring must undertake a Fundamental Rights Impact Assessment. This assessment is critical to ensure that the systems do not infringe on students' rights and comply with ethical standards.



## *Steps for Compliance and Risk Mitigation*

**Impact Assessment:** Conduct a thorough assessment focussing on the fundamental rights impacted by the AI system. This involves evaluating potential biases, accessibility issues, and privacy concerns.

**Vendor Assessment:** Ensure that AI system vendors can demonstrate compliance with the AI Act. This includes their capability to address and mitigate risks identified during the procurement stage.

**Quality Assurance:** Establish test environments to verify that AI products are safe, effective, and free of biases as per the standards set by the AI Act. This testing should be iterative to adapt to new findings and technological updates.

**Documentation and Reporting:** Maintain comprehensive records of the AI systems' impacts, testing procedures, and compliance measures. This documentation will be crucial for regulatory audits and continuous improvement.







## R&D Opportunities for Integrating Generative AI

The stringent requirements of the AI Act present numerous research and development opportunities for the application of AI in education and learning. While this technology offers huge opportunities, its adoption can be complex. Institutions procuring AI systems must conduct fundamental rights impact assessments to ensure these technologies do not infringe upon an individual's rights.

Integrating AI technologies requires specialised skills and knowledge. Researchers at ADAPT and Learnovate can offer significant expertise by helping organisations establish robust testing environments to evaluate and ensure their AI solutions are compliant with the fast-moving regulatory environment and ensure compliance with existing and new laws governing AI use. Our experts can help you identify opportunities to create value. Join us in leading research and dialogue in this evolving field and together we can ensure that the future of learning with AI is both innovative and inclusive.

# Learnovate Research Working Groups

Learnovate undertakes collaborative research funded by Enterprise Ireland and IDA to benefit the education and learning technology sector. Our members can participate on our research working groups, co-creating and shaping our research projects.. Our 4 research pillars are:

- Accelerated Digital Transformation
- Transversal Skills
- Personalisation
- The Learner in the Future of Work

Learnovate's three stage research methodology includes:

Stage 1 Research Question Definition

Stage 2 Solution Design

Stage 3 Solution Development

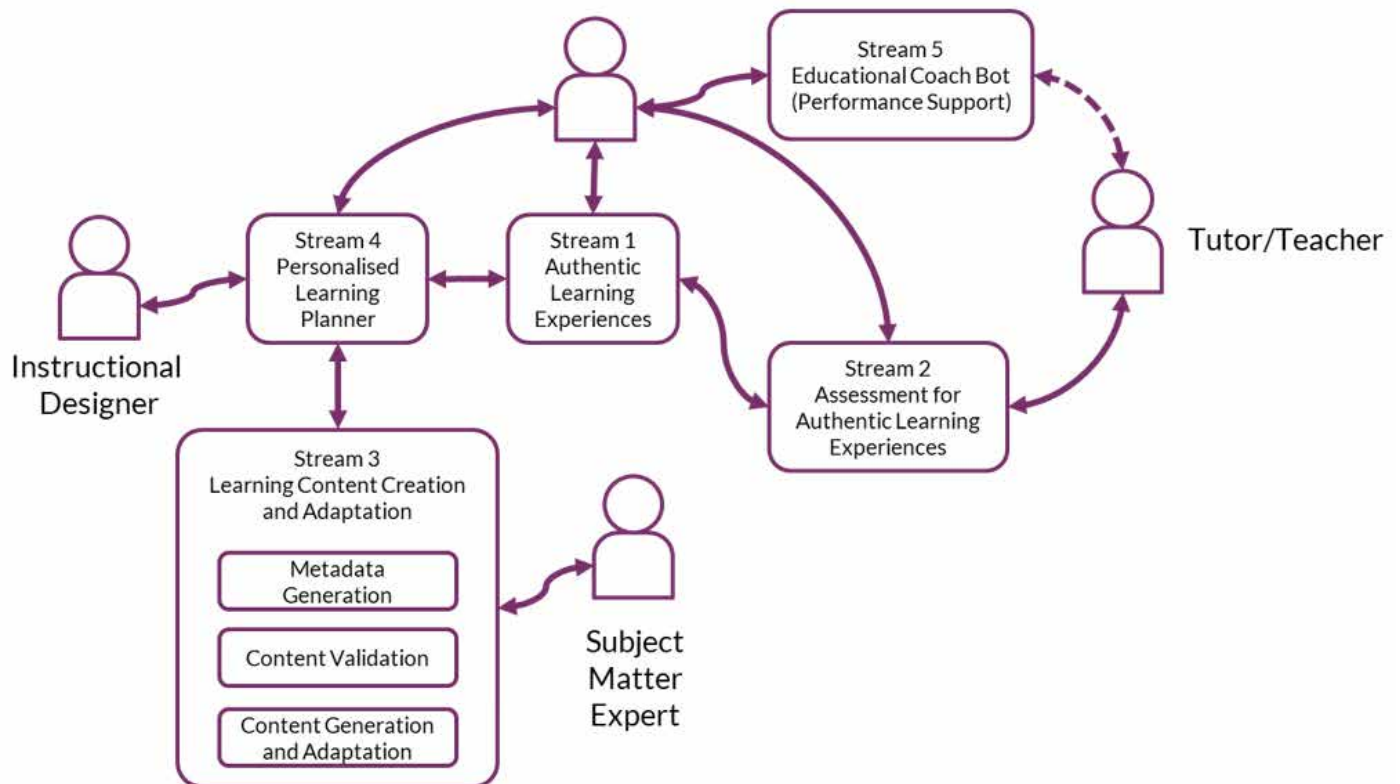
Learnovate's research team outputs include technology demonstrators, frameworks, models and diagnostic tools.



# Learnovate's AI Research Working Groups

Learnovate has over 20 Patron and Contributor Members actively influencing Learnovate's AI research agenda. These Members, from a range of lifelong learning environments, are working alongside the Learnovate research team on a variety of research streams which are outlined below.

- Authentic Assessment
- Learning Analytics
- Dynamically Generated Learning Experiences
- Personalised Learning Paths
- Adaptive/Dynamic Content Creation
- On-the-Job / Authentic Learning
- Digital Skills and Skills Development
- Performance Support, Coaching and Mentoring
- Motivation and Change Management
- AI Capabilities



# ADAPT's Discovery Experience

We know how to make AI impactful for your business  
Take the right first steps in innovation and regulation, come on the journey with ADAPT



## Understand

Get the right experts around the table to understand your challenges and objectives



## Ideate

Explore opportunities for multi-disciplinary impact with state-of-the-art AI and computer science research relevant to your business

## Roadmap

Develop and validate a credible plan for research-enabled innovation: Detailing your business challenges, research and innovation opportunities and the expected impact



## Innovation through collaboration is best.

Gain access to over 350 research experts from diverse fields who are ready to be part of your innovation journey



# Let's work together

If you planning to deploy AI initiatives for education or learning within your organisation or company then contact us. ADAPT and Learnovate are more than just a research partner; our teams provide advice and guidance and have the skills and insights to offer strategic and technological direction to help organisations achieve and shape their digital future.

We're interested in your ideas for improving learning solutions as a partner, researcher, supporter, or co-creator.

The Learnovate global community continues to grow with over 80 members from Schools / K-12, Higher Education, Government and Corporate L&D. If you would like to hear about becoming a member of Learnovate please email [membership@learnovatecentre.org](mailto:membership@learnovatecentre.org).



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**Engaging Content**  
Engaging People

ADAPT has an established network of partners across the world and is pioneering new human-centric AI techniques and technologies across a range of domains, as well as setting the standards for data governance, privacy and ethics for digital content. To explore opportunities please email [info@adaptcentre.ie](mailto:info@adaptcentre.ie)