The Impact of Generative Artificial Intelligence on Academic Integrity.

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Abstract.

Generative Artificial Intelligence (Gen AI) can transform educational praxis, enabling tailored learning experiences and enhanced skills development. However, Gen AI also poses a threat to academic integrity, enabling students to bypass learning and assessment through the generation of unauthorised content. In this study, students applied Gen AI to complete past university assessments reformatted as research tests, with the goal of achieving a pass grade when graded by an academic, undetected by an AI writing detection tool.

The findings reveal 23.8% of the AI generated solutions passed when graded by an academic, achieving grades between 40% and 60% while evading AI writing detection tools. The study provides empirical evidence of the ease at which students can use Gen AI to produce viable solutions for university assessments while circumventing AI writing detection tools and academic integrity rules. The study also provides evidence that students' ability to conceal unauthorised generation of content and artifacts using Gen AI rapidly improves with use and exposure. The study provides further evidence that many forms of traditional assessments will become less viable as more sophisticated forms of Gen AI emerge.

Keywords: Academic Integrity; Assessment; ChatGPT; Generative Artificial Intelligence; Gen AI.

1. Introduction to Artificial Intelligence.

Artificial Intelligence (AI) is now firmly rooted in our daily lives. It is in our intelligent home devices, healthcare diagnostic tools that scan our bodies, and the cars we drive or pass on the street. AI has enhanced the way we live, and it is doing the same where we work and study. Increasingly, organisations are adopting AI and using AI platforms and other technologies to develop, deploy, and maintain AI-powered products and services at enterprise scale (Anaconda, 2023). According to McKinsey (2023), the rate of enterprise AI adoption has increased exponentially, and one-third of organisations surveyed disclosed using generative artificial intelligence (Gen AI) regularly in at least one business function.

1.1 Generative artificial intelligence (Gen AI).

Generative AI transformer architectures are characterised by their use of multi-layered neural networks. These models, often referred to as multimodal large language models (LLMs), are trained on massive, petabyte-scale datasets using a combination of unsupervised and semisupervised machine learning, deep learning, and statistical algorithms. Their primary purpose is to perform a wide range of natural language processing (NLP) tasks by identifying patterns and structures within the data, enabling them to generate new and original content. For example, Generative Pre-Trained Transformer 4 (GPT4), commonly known as ChatGPT4, is a multimodal large language AI model created by OpenAI, and it is the fourth in a series of GPT foundation models.

1.2 The adoption of ChatGPT.

ChatGPT publicly released in November 2022 became the fastest growing consumer application in history (Marr, 2023). Education featured strongly in the target audience interests of ChatGPT site visitors during the period of the study. This trend continues. Ofcom UK (2025) reveal a marked increase in the use of AI tools, like ChatGPT and Microsoft CoPilot, with half of online 8 to 17-year olds using AI tools for learning and/or schoolwork. Campus Technology (2024) found that 86% of students use AI in their studies. ChatGPT's evolution from a conceptual idea to a highly influential generative AI model exemplifies the rapid advancement of generative AI technology. Chat GPT achieved 5.1 billion visits per month in May 2025 , a 13.04% increase from the previous month, and a 29.59% bounce rate (SimilarWeb, 2025).

Additional Gen AI tools emerged rapidly since the release of ChatGPT, including DALL-e, Midjourney, Co-Pilot, Claude, Grok, Gemini, Jasper, Duet AI, Elicit, Research Rabbit, Bearly AI,

Synthesia, FontyAI, Jenni, Quillbot and Cluely. A multitude of co-pilots integrated with existing software also emerged. Microsoft (2023) describe its Gen AI Co-Pilot as "*your everyday AI companion*" while the World Economic Forum (2025) refers to AI as a "*teammate*" and "*not a tool*". These Gen AI tools are driving the transformation of work practices across a wide range of industries (Marr, 2023). The disruptive impact of Gen AI on business and indeed all facets of life, will heavily influence future careers.

In March 2025, Estonia, Europe's top performer in the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA) and leader in mathematics, science and creative thinking in education, launched a national initiative called AI Leap. AI Leap aims to set the global standard for AI in education by equipping students and teachers with world-class AI tools and skills. In partnership with OpenAI, the creators of ChatGPT, Estonia is a testbed for AI in schools with the aim of providing free access to top-tier AI learning tools for 58,000 students and 5,000 teachers by 2027, starting with 16-17-year-olds by September 2025 (Petrone, 2025).

1.3 Enhancing educational praxis with Gen AI.

Research on the uses and benefits of generative AI in education is still in its early stages. As a result, there is not yet a clear consensus among academics regarding its advantages in educational settings (Firat, 2023a). However, from these studies, it is clear that Gen AI is capable of creating original essays, ideation, music compositions, graphics, videos, slides, and software code, while also producing detailed quantitative and qualitative analysis. Recent studies have identified several potential benefits of generative AI, highlighting its ability to:

- help students overcome barriers to learning, such as language deficiencies, or specific learning difficulties such as dyslexia, ADD, ADHD and autism (Botchu et al., 2023; Malmöström et al., 2023; McDermott & O'Donoghue, 2024).
- create intelligent tutoring systems capable of providing personalised assistance to students (Marr, 2023; Zhai, 2022).
- provide personalised learning support for autodidactic learners, to tailor appropriate learning programmes, and provide timely feedback (Firat, 2023a; Firat, 2023b).
- create chatbots and virtual language tutors simulating real-life conversations and providing instant feedback (Bédi et al., 2024; Božić and Poola, 2023; Firat, 2023a; Firat, 2023b; Hockly, 2023; Kohnke et al., 2023).
- help students improve their reading and writing skills. By analysing a student's writing style, ChatGPT can suggest improvements and provide feedback on grammar, punctuation, and spelling errors (Bédi et al., 2024; Božić and Poola, 2023; Hockly, 2023).

- create personalised learning experiences. By analysing a student's learning patterns and preferences, ChatGPT can recommend specific learning resources, such as articles, videos, and textbooks, that are tailored to their needs (An et al., 2023; Baidoo-Anu & Owusu Ansah, 2023; Božić & Poola, 2023; Wang, 2023; Zhai, 2022).
- generate prompts for formative assessment activities that provide ongoing feedback (Baidoo-Anu & Owusu Ansah, 2023).
- grade essays and other written assignments automatically. This can save teachers a lot of time and provide students with immediate feedback on their work (Božić & Poola, 2023; Zhai, 2022).
- improve motivation, engagement, and learning outcomes (Baidoo-Anu & Owusu Ansah, 2023; Deng & Yu, 2023).
- enhance participation and success for students from disadvantaged backgrounds (Sullivan et al., 2023).
- foster critical thinking (García-Peñalvo, 2023).
- empower students to learn complex concepts in plain language (Sullivan et al., 2023).

From a strategic educational perspective, the emergence of Gen AI compels academics to review teaching, learning and assessment practices to consider the implications of the new reality of living, working, and studying in a world where Gen AI is widely available as open source software (García-Peñalvo, 2023; Rudolph et al., 2023; Sullivan et al., 2023). However, a common concern in the academic literature pertains to the negative impact of Gen AI on academic integrity. Let us consider what we mean by academic integrity before discussing how it is challenged by Gen AI.

2. Academic Integrity.

Academic integrity has been defined in numerous ways throughout the literature, with significant variations alongside common themes. The concept and its enforcement are largely contextual, varying by national frameworks (where such agreements exist) and ultimately depending on how individual universities integrate broader national standards into their own governance policies. Quality and Qualifications Ireland (QQI) is the state agency responsible for promoting the quality, integrity and reputation or Ireland’s further and higher education system. Established in November 2019 by QQI, the National Academic Integrity Network (NAIN) is a peer-driven network of academic and professional staff, student representatives and representative agencies from across the higher education landscape in Ireland. NAIN (2021) supports Irish higher education institutions in developing a common, national understanding of academic

integrity. It also seeks to foster a culture of academic integrity across academic institutions through enhancement activities and sharing of good practice.

McDermott and O'Donoghue (2024, p. 7) contend it is imperative that "*students need guidance and support from faculty about what is/is not acceptable within their discipline and their institution*" to maintain academic integrity. Lancaster (2021, p. 366) "*considers academic integrity as it applies to teaching, learning, pedagogy and education, where students, academics and professional university staff are at the forefront of the conversation*," thus, it is all-encompassing of a university setting and not the sole domain of students. Similarly, Hill and Khan (2021) argue that effective academic integrity practices should prioritise proactively teaching and instilling academic integrity values, rather than relying on traditional punitive measures or simply focusing on prevention alone. Dodd and Peleg (2021) describe how the University of Southampton uses gamification to help students internalise academic integrity principles and develop them into lifelong practices. Their approach is holistic, encompassing both the underlying principles and values of academic integrity as well as practical understanding of related processes. Hackett et al. (2024, p. 859) discuss efforts to embed a positive culture of academic integrity in the Irish higher education sector through the development of "*an environment in which cultural change and adoption of strategic approaches to academic integrity education and awareness could take place, embedding an appreciation of academic integrity within diverse cultural contexts, in a mutually supportive, open, and collaborative manner*", while recognising the dynamic nature of academic integrity, and the necessity for "*constant monitoring, adaptation, and agility*".

It is in this context that this study adopts the definition and principles of academic integrity established by NAIN (2021, p. 3) as "*the commitment to, and demonstration of, honest and moral behaviour in an academic setting*". NAIN recommends that all interactions with higher education institutions in Ireland are approached with honesty including all documentation submitted to the institution for academic purposes. Furthermore, academic integrity involves "*compliance with ethical and professional principles, standards and practices and a consistent system of values, that serves as guidance for making decisions and taking actions in education, research and scholarship*" (NAIN, 2021, p.3). Maintaining academic integrity is critical for the reputation of higher education, and to the recognition of a graduate's academic learning and qualifications (NAIN, 2021).

2.1 Challenges posed by Gen AI for academic integrity.

AI has also been a source of significant concern with respect to academic integrity for many years (Abd-Elaal et al., 2019; Amigud et al., 2016; Lancaster, 2021; Roe and Perkins, 2022).

The emergence of publicly accessible Gen AI in 2022, and the rapid adoption of ChatGPT in particular, has dramatically increased these concerns (An et al., 2023; Baidoo-Anu and Owusu Ansah, 2023; Sullivan et al., 2023; Zhai, 2022). The challenge of Gen AI for academic integrity was explicitly highlighted by Professor Charles Terwiesch of University of Pennsylvania's Wharton School when using ChatGPT to pass an MBA exam (Kessenides, 2023). Thus, Gen AI poses a threat to academic integrity if used to bypass learning in what the European Network for Academic Integrity (ENAI, 2023) terms "*unauthorized content generation*". Emergent studies identify a number of specific challenges posed by Gen AI for academic integrity including:

- It disrupts existing educational praxis (Baidoo-Anu and Owusu Ansah, 2023), rendering some traditional methods of assessment obsolete while academic staff and management may not be trained to respond.
- It produces high levels of plagiarism (Hassanipour et al., 2024).
- It creates learning gaps by providing students with ready-made solutions, preventing them from developing the skills that the assignment was designed to teach (García-Peñalvo, 2023; Rudolph et al., 2023). This produces a distorted perception of a student's writing abilities as work is not original.
- It generates discriminatory output regarding ethnicity and gender that reflects societal stereotypes, as its statistical mechanisms reproduce the biases present in its training data, (Lippens, 2024) due to its reliance on natural language processing (Halaweh, 2023).
- It may decline to produce content that represents certain mainstream viewpoints, incorrectly claiming these refusals are due to concerns about misinformation and bias, (Motoki et al., 2025).
- It can diminish critical thinking skills (Malinka et al., 2023; Kohnke et al., 2023).
- This technology introduces inequity into the assessment process by giving socially advantaged students who can afford premium generative AI subscriptions a significant advantage over disadvantaged students who rely on free, lower-quality versions, (Cotton et al., 2023).
- It creates academic disadvantage as students with higher metacognitive levels are better able to describe goals and processes using Gen AI prompt engineering and are better able to critically adapt Gen AI solutions (Wang, 2023).
- It can lead students to outsource their assessments to individuals who are more skilled at producing high-quality outputs using generative AI (Zhai, 2022).

- It can lead to false positives and wrongful accusations of academic impropriety as AI writing detection software is not always accurate (Fowler, 2023).
- It undermines the principles of open knowledge with respect to attribution and ethically violates an author's rights by omission (García-Peñalvo, 2023).
- It produces hallucinations, algorithmic bias and copyright infringements, both in terms of machine learning models and the use of AI in education (McDermott and O'Donoghue, 2024).
- It creates privacy concerns as search and query data (Halaweh, 2023) and learner data (Hockly, 2023) may be saved and used for unintended purposes.

In addition, one must recognise that the very concept of Gen AI is unethical as it is trained using large sets of data harvested in widespread breach of international copyright and data protection laws. At its core, AI output fundamentally operates as an automated form of plagiarism. There are also significant complications within a university setting arising from the EU AI Act (2024) Article 4, with respect to the creation, training, deployment, and/or white labelling and/or customisation with respect to "*providers*" and "*deployers*" of artificial intelligence. Article 4 states that "*Providers and deployers of AI systems shall take measures to ensure, to their best extent, a sufficient level of AI literacy of their staff and other persons dealing with the operation and use of AI systems on their behalf, taking into account their technical knowledge, experience, education and training and the context the AI systems are to be used in, and considering the persons or groups of persons on whom the AI systems are to be used*". It is unlikely that any university is currently meeting these legal requirements in Ireland, or perhaps anywhere in Europe, with respect to both students and staff. Furthermore, most universities do not maintain a register of how AI is being used in the university, and thus has no transparency regarding categorisation of unacceptable, low and minimal risk AI systems and use which is in contravention of the EU AI Act (European Parliament and Council of the European Union, 2024).

Gen AI is also an affront to sustainability, as training Gen AI models consumes a significant amount of electricity due to the intense computational power required to train these large language models and the subsequent cooling systems needed to manage the heat generated by these processes. Data centers, predominantly supporting AI, already consume over 21% of Ireland's electricity, and 50% in the Dublin-Meath region. EirGrid[1] forecasts that data centers will consume 31% of Ireland's electricity by 2030. This raises important questions for

[1] https://www.eirgrid.ie/news/new-eirgrid-analysis-examines-balance-between-electricity-demand-andsupply-ireland-over-10 [2] https://sdgs.un.org/goals

educational institutions that are committed to achieving UN Sustainable Development Goals[2] while simultaneously adopting generative AI technologies on a widespread scale.

3. Research Method.

In this study, students applied Gen AI to complete past assessments, adapted as research tests, with the goal of achieving a pass grade when graded by a university academic, undetected by Gen AI writing detection tools. The objective of this study is "*to empirically test the impact of generative artificial intelligence on the academic integrity of university assessments*". Two research hypotheses were developed to test the research objective:

- Hypothesis 1: Students can complete university assessments using Gen AI undetected by AI writing detection tools.
- Hypothesis 2: Students can achieve a passing grade (>=40%) for university assessment submissions generated using Gen AI when graded by a university academic.

The study was undertaken at the South East Technological University (SETU) in Ireland, between April and September 2023. In Irish universities, grades are expressed as percentages or as a letter grade within a scale. A First Class Honours (1.1) is typically awarded for 70-100%, while Second Class Honours (2.1) is usually awarded for 60-69% and Second Class Honours, Grade 2 (2.2) for 50-59%. A Pass is typically awarded for 40-49%. This system aligns with the ECTS grading system (European Credit Transfer and Accumulation System), which uses a scale of A to F.

The implementation of the study is simple and easily replicated. The Principal Investigator (PI) first invited university academics to submit a sample of past assessments from 2020-2022. Past assessments were received from seven academics for nine modules including Fund Reporting and Risk Management; Personal, Professional and Academic Skills; Business Research and Communication Skills; Business Strategy; Global Business Ethics; Organisational Behaviour; Management Skills; Professional Development; and Behavioural Finance. The assessments include essays; spreadsheet analysis; industry and sectoral analysis reports; critical analysis of theories; presentation slides; reflective diaries; and discursive analysis. These past assessments were then adapted as research tests removing cover sheets and submission details/dates but preserving the original questions/instructions. Twenty-six (26) tests were generated from the assessments.

The PI then posted invitations on the university course management systems (CMS) for business students to enroll in two Gen AI research events in April and September 2023. The research events were hosted in the SETU digital business laboratory. Each student was

randomly assigned a research test on the CMS. No prior knowledge of the subject matter was evaluated or required. Students were instructed that the goal of the Gen AI research event was to challenge students to apply any Gen AI of their choosing to complete the past assessments adapted as research tests, with the goal of achieving a pass grade (>=40%) when graded by an academic, undetected by Gen AI writing detection tools. While the original assessments gave students several weeks to complete their submissions, students only had two hours to complete the research tests. Once completed, students uploaded their solutions to a research folder in the CMS.

The students participating were all 1st, 2nd and 3rd year business students. None of the students who participated in the April or September 2023 Gen AI research events had received any training in the use of AI in SETU. The investigator did not monitor or manage the process by which the students engaged with the research tests, nor did the investigator seek to advise or suggest any approaches to the students.

Two (2) of the twenty-six (26) research tests submitted were spoiled and inadmissible in the analysis. The valid research tests (24) were processed using Gen AI writing detection software to determine an AI writing detection score. The PI then distributed the research tests for grading to the academics who volunteered the original past assessment samples. The grading schemes and the approaches to grading used by the academics were precisely the same as for the original assessments in 2022-2022. The academics were not provided with the Gen AI writing detection scores prior to grading the tests to minimise bias when they were graded. Of the 24 valid research tests, 3 were not graded by the academic who provided the original assessment due to time constraints. The results of the data analysis are confined to 21 valid tests from the Gen AI research events as detailed in Table 1.

Table 1: Analysis of valid test submissions..

Test No.	Year	Event	Gender	AI Writing Detection Score	Academic Grade
1	3	Apr-23	M	73%	Not Graded
2	3	Apr-23	M	77%	60%
3	3	Apr-23	M	88%	40%
4	3	Apr-23	M	88%	60%
5	3	Apr-23	M	89%	35%
6	3	Apr-23	M	92%	40%
7	3	Apr-23	M	99%	Not Graded
8	3	Apr-23	M	100%	41%
9	3	Apr-23	M	100%	25%
10	1	Sep-23	M	0%	32%
11	2	Sep-23	M	0%	58%
12	1	Sep-23	F	0%	40%
13	1	Sep-23	M	0%	50%
14	2	Sep-23	M	10%	60%
15	2	Sep-23	F	14%	58%
16	1	Sep-23	F	30%	Not Graded
17	1	Sep-23	F	34%	50%
18	1	Sep-23	M	43%	19%
19	3	Sep-23	M	46%	60%
20	3	Sep-23	M	54%	45%
21	1	Sep-23	M	56%	40%
22	1	Sep-23	M	89%	35%
23	3	Sep-23	M	91%	57%
24	3	Sep-23	M	46%	0%

Once the 21 research tests were graded by the academics, the PI held informal interviews lasting 40 minutes to 1 hour, with each academic to discuss their experiences of the research tests, the grades they awarded, and their thoughts on the challenges of Gen AI for academic integrity. The PI considers this research methodology an appropriate and easily replicated benchmarking test of Gen AI and Gen AI writing detection tools, so that as academics, we can establish a clear understanding of the challenges Gen AI poses for academic integrity.

4. Findings.

The findings reveal that both research hypotheses were validated: (1) students can complete university assessments using Gen AI undetected by AI writing detection tools, and (2) students can achieve a passing grade (>=40) of higher for university assessment submissions generated using Gen AI when graded by a university academic. The AI writing detection tool vendor advises that low AI writing detection scores (less than 20% Gen AI writing detection) have a higher likelihood of being false positives and are thus insufficient grounds to raise an academic integrity enquiry. In this study, the AI writing detection tool was successful in detecting high AI writing detection scores (>20%) in 75% (18/24) of the research tests. Thus, these tests would have warranted investigation for possible breaches of academic integrity.

However, the analysis also shows that 25% (6/24) of the research tests achieved an AI writing detection score of 14% or less and would not have been flagged to the academic for investigation for breaches of academic integrity. Analysis of these six (6) tests, reveals that four (4) achieved a 0% AI writing detection score, while two tests yielded 10% and 14% AI writing detection scores. Three (3) of these tests were submitted by first year students and three (3) were submitted by second year students. None of the third-year students submitted research tests that achieved no/low AI writing detection scores.

Five (5) of the six (6) research tests with no/low AI writing detection scores received a passing grade (>-40%) from the academic who provided the past assessment. This equates to 23.8% of all tests graded (n=21). The average grade for tests achieving a no/low AI writing detection score and achieving a pass grade from an academic was 53%, with 60% the highest grade and 40% the lowest grade. It is notable that one other research test submitted by a first-year student achieved a 0% detection rate but only achieved a 32% grade from the academic. Thus, although the test received a fail grade, Gen AI content was not detected by the AI writing detection tool. It is important to highlight that the five (5) (23.8%) research tests with no/low AI writing detection scores that achieved a pass grade were not attributable to a specific academic, module or submission type as they were evenly dispersed.

The AI writing detection rate decreased significantly from 90% to just 37% between Gen AI Research Event 1 in April 2023 and Gen AI Research Event 2 in September 2023. It is also important to highlight that the five (5) research tests (23.8%) that achieved no/low AI writing detection scores were submitted during AI Research Event 2. This may indicate how quickly

students have adopted and mastered generative AI since its launch in November 2022, particularly following the PI's AI Research Event 1 in April 2023 and AI Research Event 2 in September 2023.

In this study, students were free to choose and use whatever Gen AI tools they could find to complete the research tests. While most of the students only used ChatGPT, several of the students reveal they used multiple Gen AI tools and Gen AI writing detection evasion tools including Claude, Quillbot, HideMyAi and Undetectable. In this study, Gen AI struggled to work with spreadsheet analysis. None of the research tests passed when graded by the academic. Initially trained on data to September 2021, ChatGPT's training set is continuously upgraded and it is now integrated with Microsoft Bing. Initially, ChatGPT only handled text- based prompts, but it now incorporates image-based prompts. Integration with MSOffice now enables spreadsheets to incorporate micro-app AI agents capable of extracting, cleaning and analysing tables of data (OpenAI, 2023). Hence, Gen AI poses an ever-growing challenge to academic integrity.

4.1 Insights from one-to-one interviews with university academics.

Following analysis of AI writing detection scores and research test grades, the PI held informal one-to-one interviews with each academic participating in the study. The PI believed it was important to avoid group think, to protect the anonymity of research participants, and to avoid overly steering the conversation as Gen AI was still novel in an academic integrity study at the time of the study. The interviews revealed widespread concern about generative AI among academics, with some believing that certain colleagues and managers have adopted a "*head in the sand*" approach, ignoring AI's impact on teaching and learning strategies as well as the broader education system. The academics expressed concern that students can use Gen AI to create a bibliography to accompany Gen AI text, and that some or indeed all of the bibliography may not be authentic. The academics were also concerned that they don't possess sufficient resources or time to check every reference to verify its authenticity, or relevance.

The academics were most concerned about the results of the study that showed 23.8% of students could achieve a pass grade while evading the AI writing detection tool. Academics believe that while Gen AI presents some great opportunities for learning, it presents a significant threat to academic integrity. While 25% of the tests evaded AI writing detection (23.8% evaded detection and passed), what of the other 75% of tests? The academics reveal that:

- Students overestimate their ability to use Gen AI. Students were not particularly skilled at masking their use of Gen AI to complete the test. In some instances, students didn't remove Gen AI tags from the text when they copy/pasted their solutions into MS Word.
- Students are not adept at referencing or structuring their documents in such a way that they can conceal the use of Gen AI.
- Students' limited understanding of generative AI resulted in written documents that contained numerous "*red flags*" in terms of language use and paragraph structure.
- Students often deviated from the specified task, in particular where the assessments were based on a discussion of specific theories. The students' inability to engage fully with Gen AI meant that they often used theories/theorists not required of the study.
- Students lack any real knowledge of prompt engineering, the optimal method by which Gen AI is used to complete a task. Instead, students engaged with Gen AI as if they were talking to a person.

However, it's important to consider the timing of this study (April and September 2023), which occurred shortly after ChatGPT's release when all participating students were new to generative AI. As AI technology improves and students become more experienced users, academics believe they will need to become subject matter experts to effectively detect AI-generated content. This could affect how modules are assigned to staff if they lack expertise in specific fields. However, a counterargument emerged that as generative AI evolves, the traditional need for academics or graduates to be subject matter experts may become obsolete.

The academics believe that fundamental questions need to be asked about what we are teaching, why we are teaching it, how we are teaching it, and what careers we are preparing graduates to enter. It was argued that students commencing university in 2023-2024 will emerge from degree programmes to an employment landscape transformed by AI, and much of what they are learning could be redundant if AI supplants roles. Participant academics contend that a bigger conversation must occur about the impact of AI on education beyond that of its impact on academic integrity.

5. Limitations.

While the study objective was completed as per the research funding proposal, it encountered several limitations which impacted its potential output including low levels of academic

engagement and a lack of support for the study by some senior managers. At the time of this publication, the current Academic Regulations for Taught Programmes 2024-2025[2] and the Student Academic Misconduct Policy and Disciplinary Procedure[3] at SETU do not adopt, nor refer to, NAIN definitions of academic integrity. These documents also don't refer to Generative Artificial Intelligence, Gen AI, or Artificial Intelligence or correlate such with academic integrity. These documents do refer to "*Academic integrity, plagiarism and academic offences*" but the concept of academic integrity is poorly defined and poorly conceptualised. Furthermore, neither the *Student Hub*[4] nor the *Exam Procedures and Rules*[5] web pages on the university website contain any links to policies with regard to Generative AI use. However, a link to a document called *SETU Student Guidelines on the use of Gen AI* is provided in the library guides webpage[6] and on the CMS. The document states, *"the use of any form of AI for your coursework, assessments, or research without acknowledgement is regarded as academic misconduct"* and suggests that *"it is crucial to adhere to SETU's Academic Integrity Policy*". At the time of publication there is currently no such specific policy document approved by SETU's Academic Council or available to any student on any online platform.

On June 16th 2025, two Academic Integrity Courses for academic staff[7] and students[8] developed collaboratively by academics in SETU and the Technological University of the Shannon (TUS), funded under the National Technological University Transformation for Recovery and Resilience (NTUTORR) programme and further supported through the National Forum, were made available on the national open courses website (https://opencourses.ie/). Without doubt these courses will have a significant positive impact on student and academic staff understanding of academic integrity and Gen AI. However, it is imperative that these courses are bolstered by appropriate institutional policies, a cultural shift, and structural change to assessment to be truly effective.

Another limitation is that academic participants may have been biased when grading the research tests because they knew the work was AI-generated. However, this knowledge might have actually led them to grade more harshly rather than more leniently. In a real life setting, an

[2] https://www.setu.ie/Craft/assets/policies/Academic-Regulations-for-Taught-Programmes-2024-2025.pdf
[3] https://www.setu.ie/Craft/assets/policies/Student-Academic-Misconduct-Policy-and-Disciplinary-Procedure.pdf
[4] https://www.setu.ie/current-students/student-hub
[5] https://www.setu.ie/current-students/examinations/waterford-examinations/exam-procedures-rules
[6] https://wit-ie.libguides.com/
[7] https://opencourses.ie/opencourse/understanding-academic-integrity-staff/
[8] https://opencourses.ie/opencourse/understanding-academic-integrity-students/

academic may have no such forewarning with respect to the use of Gen AI in an assessment submission.

6. Conclusions and future studies.

While OpenAI, the creators of ChatGPT, developed a software tool in February 2023 to detect text generated by ChatGPT (Quach, 2023), it was withdrawn from the market in July 2023 as it was ineffective (Horwood, 2023). In April 2023, Turnitin embedded an AI writing detection tool in its Turnitin Feedback Studio (Caren, 2023), quickly establishing itself as a key tool for academics to detect ChatGPT generated essays, presentation slides, and narrative analyses. However, several reports in the media highlight that the Turnitin AI writing detection tool is fallible and can generate false reports (Fowler, 2023). This study references these media reports as it provides empirical evidence of the ease at which students can use Gen AI to produce viable academic assessment solutions while circumventing AI writing detection tools and academic integrity rules. The findings of this study reveal that 23.8% of research tests received a pass grade or higher, undetected by an AI writing detection tool, and indeed the academic correcting the assessment. Further studies repeating the process are encouraged.

The Turnitin AI writing detection tool advises that AI writing detection scores under 20% have a higher incidence of false positives, adding a disclaimer that “our AI writing assessment may not always be accurate (it may misidentify writing that is likely AI generated as AI generated and AI paraphrased or likely AI generated and AI paraphrased writing as only AI generated) so it should not be used as the sole basis for adverse actions against a student”. The current version of Turnitin AI writing detection tool cautions “we no longer show an AI score for documents where we detect less than 20% of AI writing”. Twenty five percent (25%) of the research tests entirely written by Gen AI in this study achieved an AI writing detection score of 14% or less, and several scored 0% AI writing detection. Thus, I concur with Turnitin and urge caution when using any AI detection software to determine a breach of academic integrity standards.

This study provides evidence that students ability to conceal unauthorised use of Gen AI rapidly improves with use and exposure, as AI writing detection fell significantly from 90% to just 37% between Gen AI Research Event 1 in April 2023 and Gen AI Research Event 2 in September

2023. While the study, did not distinguish between student use of the different Gen AI tools at their disposal, it became evident that the ability to detect unauthorised AI generated content is further compounded by the use of multiple Gen AI tools and human editing of AI generated output. Tools such as HideMyAi, Undetectable; Kiin, HumanizeAI, WriteHuman, StealthWriter, DeCopyAI, OriginalityAI are already widely used to evade AI writing detection. The emergence of Cluely, a tool created "*to cheat on everything*", further compounds the challenges of Gen AI for academic integrity (Rollet, 2025). Unquestionably, the challenges for academic integrity will increase exponentially as more sophisticated Gen AI models and tools emerge, suggesting further study is required.

In this study, each student was randomly assigned a research test on the CMS. No prior student knowledge of the subject-matter was evaluated or required. Consequently, students with strong subject knowledge combined with AI literacy may have a greater ability to produce AI-assisted work that goes undetected. Future research employing similar methods could benefit from more carefully targeted test assignments.

This study provides tangible evidence that AI and Gen AI in particular, is disrupting education and potentially undermining academic integrity. It is clear that many forms of traditional assessments are no longer viable. Future research could use Bloom's Taxonomy as a framework to investigate how generative AI influences teaching, learning, and assessment. Such studies could also examine how integrating AI, Bloom's Taxonomy, and critical thinking can enhance assessment methods that promote self-directed learning.

Bloom's Taxonomy is often criticised for depicting cognitive skills as incremental building blocks, rather than interrelated and complex processes. Zaphir and Hansen (2024) demonstrate how ChatGPT still "*believes that cognitive skills are hierarchical*". Bloom's Taxonomy also fails to address the cognitive demands of Gen AI assisted learning. Gonsalves (2024) demonstrates how Gen AI can both enhance and challenge critical thinking across cognitive, affective, and metacognitive domains. Using Gen AI in creative tasks also raises concerns about the authenticity and originality of AI-generated content, impacting Krathwohl's (2010) revised Bloom's taxonomy. We need to rethink assessment strategies in higher education to better develop higherorder thinking skills, especially in the context of generative AI (Lubbe et al., 2025).

Some universities have already begun this work including Oregon State University [9] who have published a "*Bloom's Taxonomy Revisited*" specifically in the context of Gen AI.

Beyond academia, the use, or indeed misuse, of AI has raised concerns about ethics and integrity in multiple competitive settings (Roose, 2022). It is essential that employers view graduates as ethically principled individuals rather than being suspicious that their academic achievements and grades may have been compromised by improper use of generative AI. It is also important to state that although students can use Gen AI to circumvent academic integrity, it doesn't automatically mean that they will. My experience is that students are predominantly honest, upstanding and protective of their own and their university's integrity. This is evident in a Turnitin survey[10] in 2025 which reveals 64% of students are worried about the use of AI within education, more so than the 50% of educators and 41% of administrators. 95% also believe AI is being misused in their educational setting.

Nevertheless, it is imperative that the global education system adapts to meet the disruptive challenges and opportunities of GenAI. It is essential that policy makers, researchers, educators, and technology experts work together to ensure that AI can be used safely and constructively to improve education and support teaching, learning, and assessment while maintaining academic integrity. Modules, learning outcomes and assessments require structural change in the era of Gen AI. Designing assessments that require higher-level critical thinking skills is recommended. Instead of essays, students could create videos, podcasts, or websites, incorporating core readings and contemporary references. AI could be used in scaffolding a draft, but students should then refine and contextualise the content. Staged assessments with academic feedback can also reduce reliance on AI. Engaging in short writing exercises in class can also develop writing skills and enable live feedback. Oral assessments also ensure a deeper understanding and authenticate learning. Traditional written exams could include critiquing, evaluating and/or editing AI-generated content, which in essence, prepares students for future work environments while fostering critical thinking and adaptability in graduates. I would recommend that higher education adopts "*authentic student-staff partnerships with students directly involved as change*

[9] https://ecampus.oregonstate.edu/faculty/artificial-intelligence-tools/blooms-taxonomy-revisited-v2-2024.pdf
[10] https://www.turnitin.com/whitepapers/ai-in-education

agents" (Kurz et al., 2022, p. 1) and partners to build a "*shared culture of responsibility for academic integrity*" (Kurz et al., 2022, p. 7) in this ever-evolving Gen AI environment. I also suggest that guiding these change activities are the:

- EU Ethical Guidelines on the use of Artificial Intelligence (AI) and Data in Teaching and Learning for Educators (2022)[11],
- EU Artificial Intelligence (AI) Act (2024)[12],
- NAIN Academic Integrity Guidelines (2021),
- NAIN (2023b) Framework for Academic Misconduct Investigation & Case Management,
- NAIN (2023a) Generative Artificial Intelligence: Guidelines for Educators,
- UNESCO (2024) AI Competency Framework for Students[13],
- Perkins et al. (2024) AI Assessment Scale (AIAS).

Acknowledgements

The PI would like to thank the senior management, academics and students who supported and participated in this study, without whose engagement and teamwork, it could not have been completed. The PI and the participants would like to acknowledge the funding provided by the Strategic Alignment of Teaching and Learning Enhancement (SATLE) funding in Higher Education 2022/2023 and the N-TUTORR National Project 2023 without whose support this research would not have been possible. The PI also acknowledges the inspiring work of the National Academic Integrity Network (NAIN) Ireland.

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[11] https://op.europa.eu/en/publication-detail/-/publication/d81a0d54-5348-11ed-92ed-01aa75ed71a1/language-en

[12] https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai

[13] https://unesdoc.unesco.org/ark:/48223/pf0000391105

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