From Ethical Framing to Practical Outcomes: Assessing Reliability, Trustworthiness, and Effects on Learning in Early AI Interactions in Higher Education

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Abstract: While AI is rapidly reshaping higher education by offering greater accessibility, personalized learning, and enhanced student engagement, its adoption often surpasses institutional capacity to adapt governance, pedagogy, and knowledge practices. This study, part of an ongoing collaboration between the University of North Carolina Wilmington (USA) and the University of Hertfordshire (UK), explores the practical integration of AI in higher education and proposes an Artificial Intelligence Readiness Framework to support curriculum design, assessment, governance, and knowledge management. The paper presents an exploratory case study of guided AI use in a large postgraduate taught module involving over 300+ international students at the University of Hertfordshire Business School. Drawing on module-level secondary data and instructor reflections, the study examines student engagement with AI, challenges encountered, and implications for teaching and assessment practice. Preliminary findings suggest that structured AI integration within active learning activities supported idea generation, writing development, and student engagement. However, instructor observations also indicated that some students relied on AI-generated content without sufficient critical evaluation, resulting in weaker alignment with assessment expectations. While students generally disclosed their use of AI, concerns remained regarding overreliance and the development of critical thinking skills. The study offers preliminary practitioner insights and introduces an AI Readiness Framework to support the responsible and pedagogically informed integration of AI into higher education curricula.

Keywords: Artificial intelligence, Higher education, Generative AI, AI readiness framework, Curriculum design

1. Introduction

Artificial Intelligence (AI) is rapidly transforming higher education by reshaping how students learn, how faculty teach, and how institutions create and disseminate knowledge. Recent advances in generative AI, particularly large language models (LLMs) such as ChatGPT, Gemini, and Claude, have accelerated AI adoption across educational environments. These tools offer opportunities to enhance student engagement, personalize learning, improve writing, and increase access to information while introducing challenges related to reliability, trustworthiness, academic integrity, critical thinking, and institutional governance (Kasneci et al., 2023).

The emergence of generative AI represents a fundamental shift in how learners interact with information. Rather than relying solely on instructors, textbooks, and digital resources, students can now generate content, summarize concepts, receive feedback, and solve problems in real time. These capabilities have the potential to democratize knowledge and create more adaptive learning experiences. From a connectivism perspective, learning increasingly occurs through networks of people, information sources, and digital technologies, positioning AI as an influential participant within educational ecosystems (Siemens, 2005).

Despite these benefits, universities have struggled to keep pace with rapid technological change while maintaining academic standards and higher-order cognitive development. Faculty face questions regarding appropriate AI use in teaching, assessment, and classroom activities, while students must navigate evolving expectations surrounding transparency, responsible use, and ethical boundaries. Consequently, institutions must balance AI innovation with effective risk management. A major concern involves the reliability and trustworthiness of AI-generated content. Although generative AI often produces convincing responses, it may also generate inaccurate information, fabricated references, biased outputs, or misleading conclusions. Trustworthy AI requires transparency, accountability, explainability, and human oversight (Floridi and Cowls, 2019). Recognizing these challenges, the National Institute of Standards and Technology (NIST) developed governance frameworks to support responsible AI adoption and risk management (NIST, 2023). However, translating these principles into educational practice remains difficult.

AI also raises concerns regarding critical thinking and knowledge development. While educational research emphasizes analysis, synthesis, evaluation, and independent reasoning, the convenience of generative AI may encourage reliance on machine-generated outputs rather than deep engagement with course material. Research on automation and decision support demonstrates that users frequently develop a dependency on

technologies that provide efficient solutions (Parasuraman and Riley, 1997), while cognitive psychology suggests that people naturally favor cognitive shortcuts when information is readily available (Kahneman, 2011). Together, these tendencies increase the risk of cognitive offloading and reduced intellectual engagement.

Academic integrity has likewise emerged as a significant concern. Early institutional responses emphasized plagiarism detection and authorship verification, but increasingly capable AI systems have exposed the limitations of detection-based approaches. Many scholars instead advocate assessment redesign, transparent disclosure practices, and AI literacy initiatives that promote responsible use while preserving academic standards.

Beyond teaching and assessment, AI adoption requires institutional governance, faculty development, curriculum alignment, and effective knowledge-sharing mechanisms. Research on digital transformation shows that organizational readiness depends on leadership, workforce capabilities, governance, and knowledge conversion (Bounfour et al., 2023), while knowledge management theory highlights the importance of capturing and institutionalizing expertise across communities of practice (Nonaka and Takeuchi, 1995).

Although interest in AI in higher education continues to grow, much of the literature remains focused on ethics and policy rather than empirical evidence of AI's effects on learning. Few studies examine the interconnected relationships among reliability, trustworthiness, critical thinking, academic integrity, and organizational readiness, leaving institutions with limited practical guidance for sustainable AI implementation. This study examines guided AI use within a large postgraduate module at the University of Hertfordshire Business School involving more than 300 international students. Drawing upon secondary data and instructor reflections, the study explores student and faculty perceptions of AI, its effects on learning and engagement, and challenges associated with its implementation.

Building on these findings, the study proposes an Artificial Intelligence Readiness Framework (AIRF) integrating four dimensions: governance, curriculum design, assessment strategy, and knowledge management. The framework provides practical guidance for trustworthy, effective, and pedagogically grounded AI adoption. By moving beyond ethical framing to focus on measurable educational outcomes, this research contributes to emerging discussions on AI in higher education and offers actionable recommendations for educators, administrators, and policymakers.

2. Literature Review

2.1 Artificial Intelligence in Higher Education

Artificial Intelligence (AI) has rapidly emerged as one of the most transformative technologies affecting higher education. Recent advances in generative AI systems, particularly large language models (LLMs) such as ChatGPT, Claude, and Gemini, have introduced new opportunities for personalized learning, content creation, tutoring, and academic support (Kasneci et al., 2023). These technologies can provide immediate feedback, generate instructional materials, support brainstorming activities, and assist students in developing written assignments. As a result, many higher education institutions are exploring ways to incorporate AI into teaching and learning practices. Researchers have argued that AI can improve student engagement by providing individualized learning experiences and reducing barriers to accessing information. AI-enabled learning environments may support self-directed learning, increase productivity, and assist students in organizing and synthesizing complex information. Studies have also reported positive outcomes related to writing quality, idea generation, and learner confidence when AI tools are used appropriately within structured educational settings. Despite these potential benefits, the pace of AI adoption often exceeds institutional readiness. Universities continue to struggle with questions regarding acceptable use, assessment redesign, faculty preparedness, and policy development. Consequently, the challenge is no longer whether AI should be incorporated into higher education, but rather how it can be integrated in ways that support learning while preserving academic rigor and educational integrity.

2.2 Reliability and Trustworthiness of Generative AI

Trustworthiness has emerged as a critical concern in discussions surrounding educational AI adoption. Trustworthy AI systems are generally characterized by reliability, transparency, accountability, fairness, and explainability. While generative AI systems demonstrate impressive capabilities, their outputs are inherently probabilistic and may contain inaccuracies, fabricated references, outdated information, or misleading conclusions.

Research has shown (Noorbehbahani and Oyibo, 2026) that users frequently overestimate the accuracy of AI-generated content, particularly when responses are presented in a confident and authoritative manner. This phenomenon is especially concerning in educational environments where students may lack sufficient domain expertise to identify errors or critically evaluate generated information. As a result, the effectiveness of AI-supported learning depends not only on the technical performance of AI systems but also on the user's ability to assess and verify outputs.

Several scholars (Song and Song, 2023; Malik et al., 2024) have argued that AI literacy should become a core competency in higher education. Rather than treating AI systems as authoritative sources of knowledge, students must develop the skills necessary to evaluate outputs critically, verify evidence, and understand the limitations of algorithmic systems. Trustworthy implementation, therefore, requires a combination of technical safeguards, instructional guidance, and institutional governance mechanisms.

2.3 AI, Critical Thinking, and Academic Integrity

The relationship between AI use and critical thinking represents one of the most significant debates within contemporary higher education research (Gerlich, 2025). Critical thinking is widely recognized as a fundamental learning outcome encompassing analysis, evaluation, synthesis, and reasoned judgment. However, concerns have emerged that excessive reliance on AI-generated outputs may reduce opportunities for students to engage in these higher-order cognitive processes.

Research on automation and decision support systems suggests that users frequently develop dependency behaviors when technological tools provide convenient solutions. Similar concerns have been raised regarding generative AI in education, where students may accept AI-generated responses without independent analysis, fact-checking, or deep engagement with course content. Such behaviors may contribute to cognitive offloading, with individuals delegating intellectual tasks to technology rather than performing them independently.

Academic integrity presents a related challenge. Early institutional responses to generative AI focused on plagiarism, authorship, and assessment authenticity. Although AI detection tools have gained popularity, their effectiveness remains inconsistent, and many scholars argue that detection-based approaches alone are insufficient. Instead, emerging literature emphasizes assessment redesign, transparency requirements, authentic learning activities, and responsible AI use policies as more sustainable approaches (Adeshola and Adepoju, 2023). Recent studies (Zhang and Reusch, 2025) indicate that students generally support transparent AI use and recognize the ethical implications of generative AI. Nevertheless, evidence suggests they often struggle to distinguish between appropriate assistance and inappropriate dependence. This tension highlights the need for educational frameworks that promote responsible AI use while maintaining academic standards and fostering critical thinking skills.

2.4 AI Governance and Organizational Readiness

As AI adoption accelerates, universities increasingly face governance challenges associated with technology integration. AI governance refers to the structures, policies, processes, and oversight mechanisms that guide the responsible development and use of AI systems. Within higher education, governance encompasses issues related to academic integrity, privacy, transparency, curriculum design, assessment, intellectual property, and institutional accountability. Existing research suggests that many universities remain in the early stages of AI governance maturity. While institutions have developed ethical guidelines and acceptable use policies, fewer have established comprehensive governance structures capable of addressing operational, pedagogical, and strategic implications. This gap between technological capability and organizational readiness creates uncertainty for faculty, students, and administrators.

Organizational readiness frameworks provide useful lens for understanding successful technology adoption. Prior research on digital transformation emphasizes the importance of leadership commitment, workforce capabilities, governance mechanisms, and knowledge management practices. Similar principles apply to AI adoption in higher education. Effective implementation requires not only technological resources but also faculty training, curriculum alignment, assessment redesign, and mechanisms for continuous organizational learning.

Knowledge management literature further highlights the importance of capturing, sharing, and institutionalizing best practices. As faculty members experiment with AI-enabled teaching approaches, universities must establish processes to disseminate lessons learned and promote evidence-based decision-making. These considerations

suggest that AI readiness extends beyond technological preparedness and encompasses governance, pedagogy, culture, and organizational learning.

2.5 Research gap and Theoretical Foundation

Although the existing literature provides valuable insights into AI adoption, academic integrity, and educational technology, several important gaps remain. First, much of the current research focuses on ethical considerations and policy discussions rather than empirical evidence regarding the effects of AI on learning outcomes and student behavior. Second, relatively few studies examine the interaction between reliability, trustworthiness, critical thinking, and academic integrity within a unified framework. Third, there remains limited guidance regarding how institutions can assess and improve their readiness for effective AI integration.

This study examines a real-world implementation of guided AI use within a large postgraduate course and develops an Artificial Intelligence Readiness Framework (AIRF) as seen in Figure 1 that integrates governance, curriculum design, assessment strategy, and knowledge management. The framework seeks to move beyond ethical considerations alone and to provide practical guidance for institutions seeking to adopt trustworthy, pedagogically grounded AI.

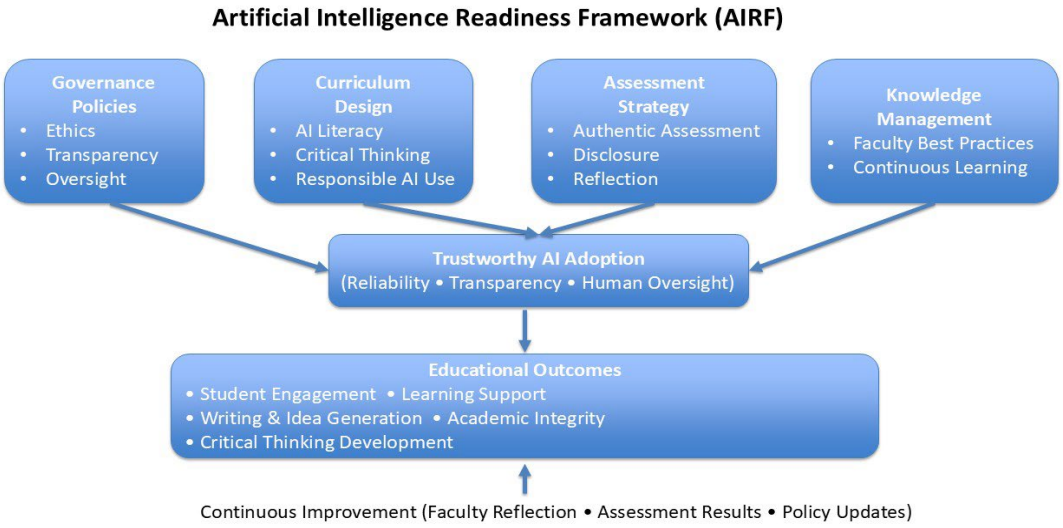


Figure 1: AI Readiness Framework (AIRF)

3. Research Methodology

This study forms part of an ongoing project investigating the responsible integration of artificial intelligence (AI) into postgraduate business education. A qualitative evaluative case study approach was adopted, incorporating elements of reflective practice. Case study evaluation is an appropriate methodology for examining educational interventions within their real-world context and for exploring the relationship between programme implementation and outcomes (Keen and Packwood, 1995). The study aimed to evaluate the implementation of AI strategies within a large postgraduate Business and Management (B&M) programme at the University of Hertfordshire Business School (UHBS) and to generate evidence-based recommendations for the effective, trustworthy and pedagogically sound integration of AI into higher education.

3.1 Case Study Context

The case study was conducted within the MSc International Business programme at UHBS. The programme has a complex structure, comprising three study routes (one-year, placement, and advanced research) and two annual intakes (September and January), enrolling approximately 2,000 students each academic year. The majority of students are international and represent diverse educational, cultural and linguistic backgrounds. The study focused on one compulsory module, Leading Innovation and Change (LIC). The module was delivered by the module leader together with between seven and twelve tutors, depending on the intake, across approximately fifteen seminar groups, each consisting of around 50-60 students. All groups followed the same syllabus, learning materials and assessment tasks. Module resources, including lecture slides, journal articles,

book chapters, case studies, videos and assessment guidance, were provided through the University's Canvas virtual learning environment.

3.2 Secondary Data Sources

The study drew upon secondary qualitative data generated through routine teaching, learning and assessment activities rather than data collected specifically for research purposes. The documentary data included module handbooks, assessment briefs, Weekly Reflective Work submissions, AI Declaration Forms, anonymised module evaluation feedback, and other module documentation produced during the implementation of AI-enhanced learning. These documents provided evidence of how AI was integrated into teaching, how students engaged with AI tools, and how responsible AI use was demonstrated throughout the module.

The dataset analysed in this study comprised approximately 700 Weekly Reflective Work submissions (per week) and 700 AI Declaration Forms, collected during the 2024–25 and 2025–26 academic years. Reflective notes maintained by the module leader and Tutors throughout the implementation period were analysed separately to provide contextual insights into the design, delivery and refinement of the intervention. These reflections informed interpretation of the findings but were not treated as primary empirical evidence.

3.3 AI Initiatives and Implementation

During the 2024–25 academic year, initial strategies promoting the ethical use of AI tools were introduced within the module with 335 students. Guidance on responsible AI use was incorporated into the module handbook, clearly identifying where AI could appropriately support learning and where its use was prohibited. Under tutor guidance, students were encouraged to use AI during Learning Set Conversations (LSCs) to support idea generation, innovation proposal development, information gathering, and improvements in academic writing. This approach aimed to promote active and personalised learning through continuous support from tutors, while ensuring equitable access to AI technologies for students from diverse educational backgrounds. Initial implementation informed subsequent curriculum development.

Building on this experience, AI use was formally integrated into module assessment during the 2025-26 academic year. Students (365) were permitted to use AI in preparing their Weekly Reflective Work, which was based on weekly LSC discussions. Detailed guidance regarding ethical AI use was incorporated into the assessment brief. Students were also required to submit an AI Declaration Form documenting where, how and to what extent AI tools had been used during assessment preparation. This process was designed to promote transparency, responsible AI use and academic integrity while maintaining student ownership of submitted work.

3.4 Reflective Analyses

As part of an ongoing collaborative project, this section presents preliminary reflective analyses drawn from the review of module secondary data and tutors' reflections and observations gathered during the marking process. The purpose of this stage of the study is not to provide definitive claims regarding the impact of AI on student learning, but rather to identify emerging patterns and areas requiring further investigation across the collaborating teams. The use of tutor reflections and module-level observations is therefore an important component of the collaborative inquiry process, enabling the project team to identify potential challenges, refine future interventions, and inform subsequent stages of data collection and analysis.

The initial analysis identified two emerging areas of concern relating to the reliability and trustworthiness of AI-supported assessment practices: (1) An overreliance on AI-generated output without sufficient critical evaluation and (2) the potential implications of AI reliance for the demonstration and development of critical thinking skills.

- An overreliance on AI-generated output without sufficient critical evaluation

Although most students appropriately declared their use of AI and submitted the required documentation, the module team observed evidence that, in some cases, AI-generated content was incorporated into assessments with limited evidence of critical engagement. Please note that, these observations should be understood as emerging themes from the current phase of the collaborative study rather than generalised conclusions about all students' AI practices. While AI was often used effectively during the LSC to support idea generation and information gathering, concerns emerged during the marking process regarding its application in Weekly Reflective Work submissions. Some submissions appeared to rely heavily on AI-generated responses without sufficient review, adaptation, or verification of accuracy. This suggests that, although students recognized AI as a useful learning tool, some may not have fully engaged in the reflective and evaluative processes to ensure that

AI-generated content was meaningfully integrated, critically assessed, and aligned with the intended learning outcomes of the task.

This overreliance was evident in several ways. For example, many submissions addressed the general topic but did not fully meet the specific requirements of the assessment brief. Although the content was often clear and well organized, it frequently lacked alignment with the learning outcomes, assessment criteria, and subject-specific expectations. In many cases, AI-generated content provided broad or generic explanations rather than the focused analysis or evaluation needed to achieve higher grades. Markers also observed that some students included information, examples, or arguments that were accurate but not directly relevant to the assessment task. On some occasions, students reflected on random case studies related to the weekly topic instead of the specific case study that was analysed during the LSC, which was the task of the assessment (Please see Appendix 1). This suggests that AI-generated content may have been used without sufficient evaluation of its relevance to the question or assessment criteria. As a result, some assignments contained substantial descriptive content but showed limited evidence of independent judgment and critical engagement with the topic.

- The development of critical thinking skills

The observation also raises concerns about the development of critical thinking skills. As highlighted in the literature (Duron et al., 2006), critical thinking is a fundamental learning outcome that involves analysis, evaluation, synthesis, and reasoned judgment. Markers identified that submissions that were conducting independent analysis, fact-checking information, or engaging deeply with course content were missing. The marking process revealed that students who depended most heavily on AI-generated text often demonstrated weaker understanding of the underlying concepts when compared with peers who used AI as a supplementary tool rather than a primary content generator. Their work frequently lacked personal insight, critical reflection, and evidence of engagement with module materials. As a result, there was often a disconnect between the apparent sophistication of the written language and the depth of understanding demonstrated through the assessment.

These observations provide an important area for further investigation within the ongoing collaborative project. They do not suggest that AI use inherently reduces students' critical thinking abilities; rather, they highlight the need to examine how different patterns of AI use influence learning processes. Previous research has similarly emphasised that the educational value of AI depends significantly on how students interact with the technology and whether AI is used to enhance, rather than replace, analytical and reflective activities.

The findings from this stage of the project therefore support the need for clearer guidance on responsible and effective AI use in learning and assessment. Students may benefit from further support in evaluating AI-generated information, checking accuracy, identifying limitations, and adapting outputs to reflect their own understanding and disciplinary knowledge. As the project continues collaboratively, additional evidence will be gathered and analysed to further explore these emerging themes and develop a more comprehensive understanding of how AI-supported learning practices influence student engagement, critical thinking development, and assessment performance.

3.5 Ethical Consideration

The recommendations and implications presented in this study are based on reflective analysis of secondary data from the 2025-26 module cohort. As this study was carried out purely for pedagogical reasons and is not conceived as pure research at this stage, the study did not go through ethical approval. The examples included in the appendices do not contain any identifiable information, do not affect students' privacy, and do not pose any risk of upsetting or disturbing the students *(UH, UPR RE01, 2021)*. The recommendations and implications discussed in this study have been shared through both informal and formal discussions, as well as at conferences within and outside the University.

According to Universities policy *"Protocol for Reflective Practitioner Work by Academic Staff" - The intention of a tutor who reflects on the curriculum, how it operates, how it matches the students' needs and expectations and the requirements of external bodies and so on, is simply to update and/or improve the curriculum in the interests of doing what the University is charged to do: providing a curriculum that is current and comparable to that offered at other institutions. This is normal professional practice and is undertaken with purely pedagogical concerns in mind. The tutor has no research agenda in mind at the time and it is important that this professional updating should proceed without any tutor thinking that it should be inhibited by ethical considerations. Assuming that what happens to the students as a result of the changes continues to be ethical in a broad sense, there is no need to apply for ethical approval for them. The distinction to be made is that that the changes were*

made by the tutor in the interest of improving the module and the student experience and not in the interest of carrying out a piece of research. (UPR RE01, 2021). The academic staff may reflect systematically on their teaching practice, curriculum operation, and student learning needs without requiring ethical approval where the primary purpose is pedagogical improvement rather than research.

Although the University of Hertfordshire acknowledges the importance of embedding AI across education, research, operations, and partnerships, it is still in the process of developing a formal AI policy. Currently, the use of AI is monitored under UPR AS14: Academic Integrity and Academic Misconduct, which emphasizes that students must uphold principles of academic honesty, including avoiding plagiarism, collusion, and the inappropriate use of generative AI tools such as ChatGPT.

> *"2.4 Unauthorised use of artificially generated material (AI) in researching or presenting material for an assessment is an academic misconduct offence if you use AI tools in producing your assessment unless the use of AI tools is expressly permitted. However, even if expressly permitted, where you do not declare that you have used an artificial intelligence tool(s) in the production of your assessment, or you are dishonest about the extent to which such tools have been used, you will have committed academic misconduct. The extent to which assessment content is considered to be AI generated is a matter of academic judgement" (UH, UPR AS14, 2024).*

Feedback from pioneering cases that promote the ethical use of AI tools is crucial to the policy development process, ensuring their responsible and effective implementation. Several case studies have demonstrated the significant benefits of integrating these tools into the curriculum, while also highlighting associated challenges. One such case, discussed in this paper, provides valuable insights into both the advantages and obstacles encountered.

4. Conceptual / Policy Contribution

This study contributed to the growing body of research on AI in higher education by shifting the focus from ethical principles alone to institutional readiness for AI adoption. It proposed an AI Readiness Framework for Higher Education that integrated four complementary dimensions: AI-integrated curriculum design, AI-aware assessment, governance and institutional policy, and faculty capability development. By bringing these elements together, the framework provided a structured foundation for understanding how institutions could move from isolated AI initiatives to a coordinated institutional strategy. From a policy perspective, the findings highlighted the need for clear governance that balanced innovation with academic integrity, transparency, and responsible AI use. The proposed framework offered institutional leaders and policymakers practical guidance for developing AI strategies, revising assessment practices, supporting faculty development, and establishing governance structures that enabled the effective and sustainable integration of AI into teaching and learning.

5. Discussion and Findings

The findings revealed strong similarities between the UK and U.S. higher education contexts, with participants in both institutions recognizing AI's potential to enhance learning while expressing concerns regarding reliability, academic integrity, faculty preparedness, and institutional governance. Although differences existed in institutional policies and implementation approaches, both universities faced common challenges in balancing innovation with responsible AI adoption. From a cybersecurity and digital risk governance perspective, the results highlighted that AI integration extends beyond pedagogy to encompass issues of data privacy, security, transparency, and organizational accountability. These findings suggest that higher education institutions should treat AI adoption as both an educational and governance challenge, requiring coordinated policies that manage digital risks while enabling effective and trustworthy use of AI in teaching and learning.

6. Limitations and Future Work

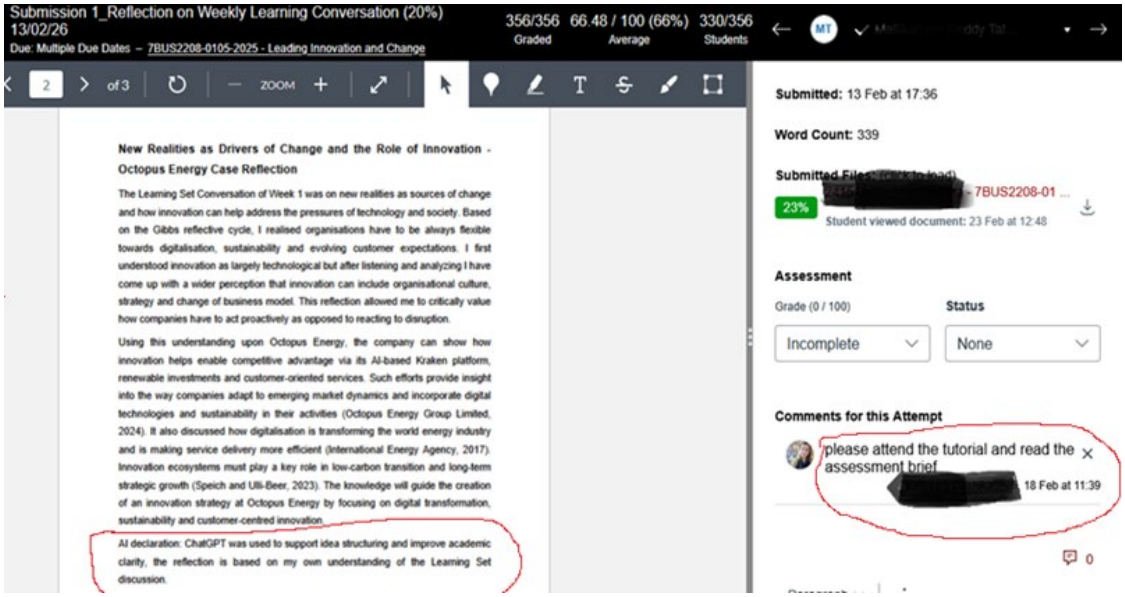
While the study provides valuable insights into effective practices and potential challenges in the evolving field of AI in Education, it also has several limitations. First, the recommendations are primarily based on findings from a literature review and reflective analyses conducted during the second phase of this ongoing research. The next phase of the project, which will involve collecting and analyzing empirical data across two institutions, is expected to offer more precise and evidence-based insights. Furthermore, it is important to acknowledge that the case study underpinning this research is situated within one of the largest postgraduate courses in the UHBS. As such, the findings may not be directly transferable to other disciplines or to undergraduate contexts, where classroom dynamics and learner needs may differ significantly.

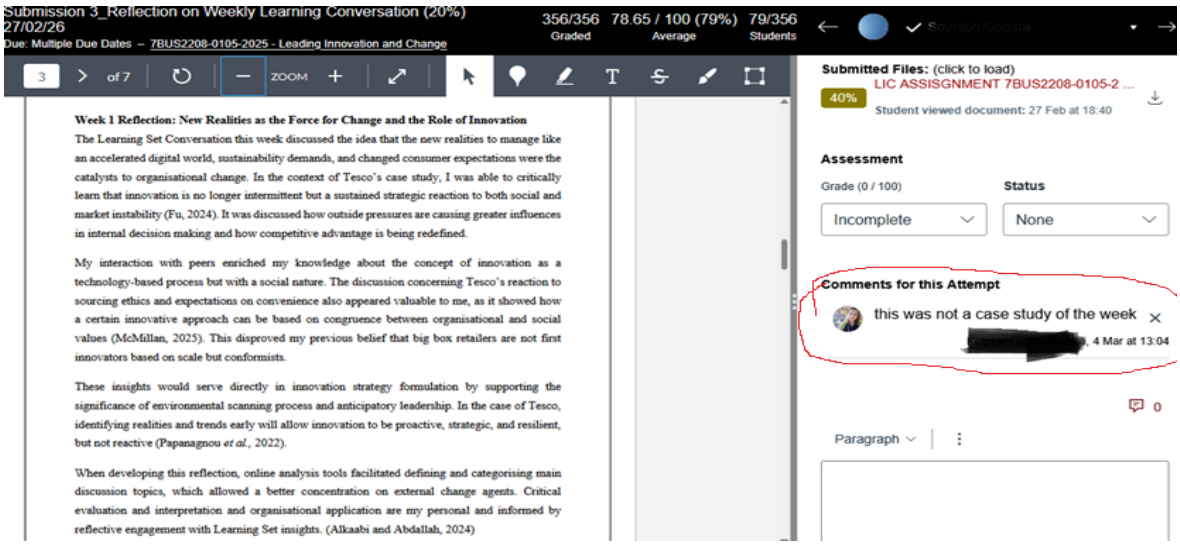
7. Conclusion

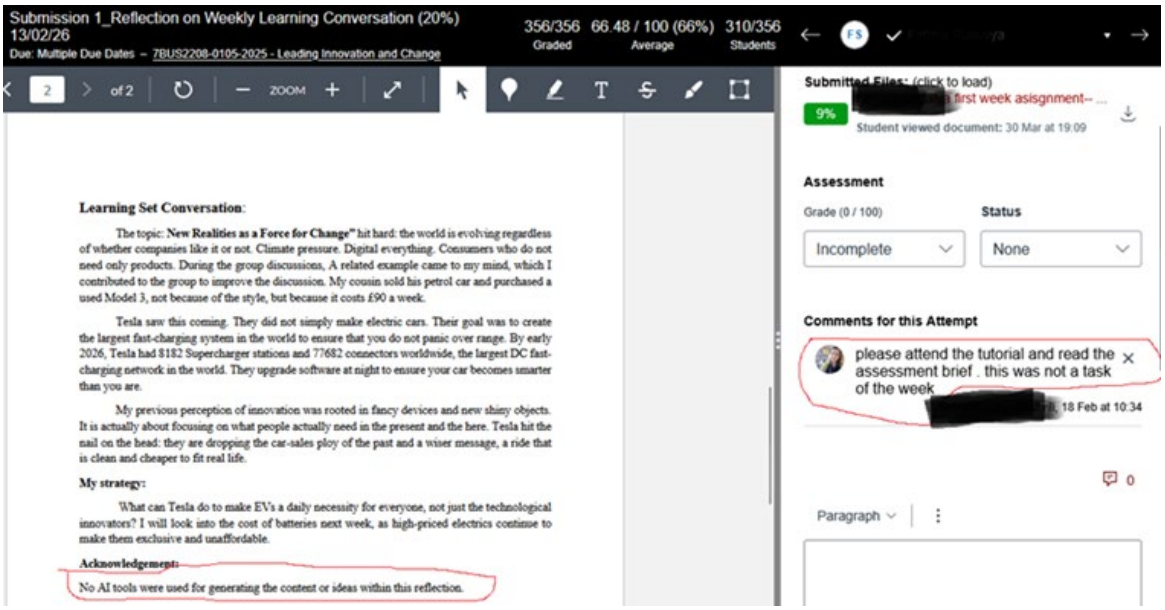
Artificial intelligence is rapidly transforming higher education, creating opportunities to enhance learning while introducing new challenges related to trust, governance, assessment, and institutional readiness. This study demonstrated that although faculty and students in both the United Kingdom and the United States recognized the educational benefits of AI, they also shared concerns regarding reliability, academic integrity, transparency, and the preparedness of higher education institutions to support its responsible use. To address these challenges, this paper proposed an AI Readiness Framework for Higher Education that integrated AI-enabled curriculum design, AI-aware assessment, governance and institutional policy, and faculty capability development. The framework provided a practical foundation for institutions seeking to move beyond reactive AI adoption toward a coordinated, strategic approach that balanced innovation with responsible governance. The findings also highlighted that AI should be viewed not only as a pedagogical innovation but also as a digital governance challenge requiring clear policies, ongoing faculty support, and effective risk management.

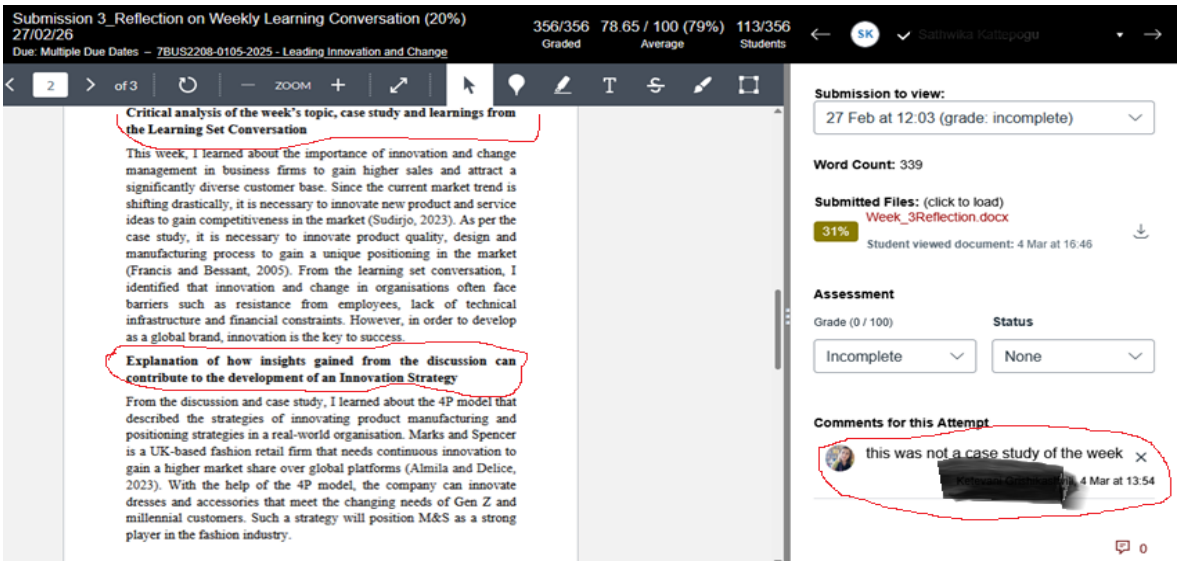
As AI technologies continue to evolve, higher education institutions must develop adaptive governance models that promote responsible innovation while preserving academic integrity and student learning. Future research should validate the proposed framework across diverse institutional contexts, examine its long-term impact on educational outcomes, and explore how evolving AI capabilities will shape teaching, learning, and policy development.

Visual images of discussed cases









Ethics Declaration: This research did not involve human participants, human subjects data, or experimental procedures requiring institutional ethical approval. Accordingly, ethical clearance was not required for this study.

AI Declaration: AI-assisted writing tools were used solely to improve grammar, spelling, readability, and language clarity. No AI-generated content was used to develop the research findings, analysis, or conclusions. The authors are fully responsible for the content of this manuscript.

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