LAB University of Applied Sciences

# Optimizing the use of Artificial Intelligence amongst students of Higher Education

LAB University of Applied Sciences
Bachelor of Business Technology, Business Information Technology
2025
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**Abstract**


| Author(s) | Publication type | Completion year |
|---|---|---|
| Raymond Toritseju Nesiama<br>Yassir Belmejdoub | Thesis, UAS | 2025 |
| | Number of pages<br>46 | |


Title of the thesis

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Abstract

This thesis explores the ways in which Artificial Intelligence (AI) tools are used by students in higher education, with reference to ethical awareness, patterns of use, and institutional preparedness. The accelerated adoption of generative AI platforms, such as ChatGPT, Grammarly, and DeepL, within academic workflows has transformed learning habits and questioned current educational conventions. The research seeks to evaluate how students interact with these tools, the perceived advantages and threats, and the degree to which they respect ethical AI standards.

The research employs a mixed-method approach combining quantitative surveys (n=111) and qualitative interviews (n=10) to gather a comprehensive view of AI engagement across multiple academic disciplines in Europe. Survey results reveal widespread use of AI for structuring assignments, idea generation, and translation, while interviews highlight growing student concerns about academic integrity, data privacy, and cognitive overreliance. Findings were analysed using thematic coding and compared against the UNESCO AI Competency Framework for Students (2024).



Keywords

Artificial Intelligence, Higher Education, AI Literacy, Academic Integrity, UNESCO Framework, Generative AI, Ethical Use.

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# 1 Introduction

## 1.1 Background of the Study

Artificial Intelligence (AI) is revolutionizing the dynamics of higher education, particularly from the standpoint of student usage. Tools such as *ChatGPT*, *Claude*, *DeepSeek*, and other generative AI platforms have evolved from experimental novelties to essential academic utilities. Students increasingly rely on these tools for research, summarization, idea generation, translation, writing assistance, and time management, transforming them from learners to co-creators of knowledge (Khan, 2024.).

This shift is not just technical but cultural. As Khan (2024.) observes, the same AI that fosters creativity can also dull it, depending on how it's wielded. Bloom's classic "Two Sigma Problem" remains foundational here: personalized instruction yields substantial performance gains but was historically unscalable. With AI-powered tutoring, intelligent feedback loops, and real-time personalization, this long-held pedagogical aspiration now appears feasible (Deckker & Sumanasekara, 2024, 4.).

Nonetheless, this transformation is not without serious tensions. The ethical use of AI, the preservation of academic integrity, and the widening digital divide demand institutional attention. Students report conflicting attitudes toward AI, toggling between genuine augmentation of their cognitive processes and mere automation of tasks (Valdiviezo Sir et al., 2024, 5.5). AI in education is both a scalpel and a crutch, as its long-term impact depends on its contextual deployment and the degree of ethical literacy embedded within student use (Beckingham et al., 2024, 9.).

In response to this evolving landscape, this study aligns with LAB University of Applied Sciences' role in the Erasmus+ ARTISAN project, which emphasizes ethical digital literacy and AI readiness. Through mixed-method analysis, the thesis explores how students engage with AI tools, what they expect, and where institutions should intervene with policy, pedagogy, and support. A survey carried out on student usage of GenAI in 2024 acknowledged that 56% depended on it for structuring while 11% for Feedback (Beckingham et al., 2024, 71.)

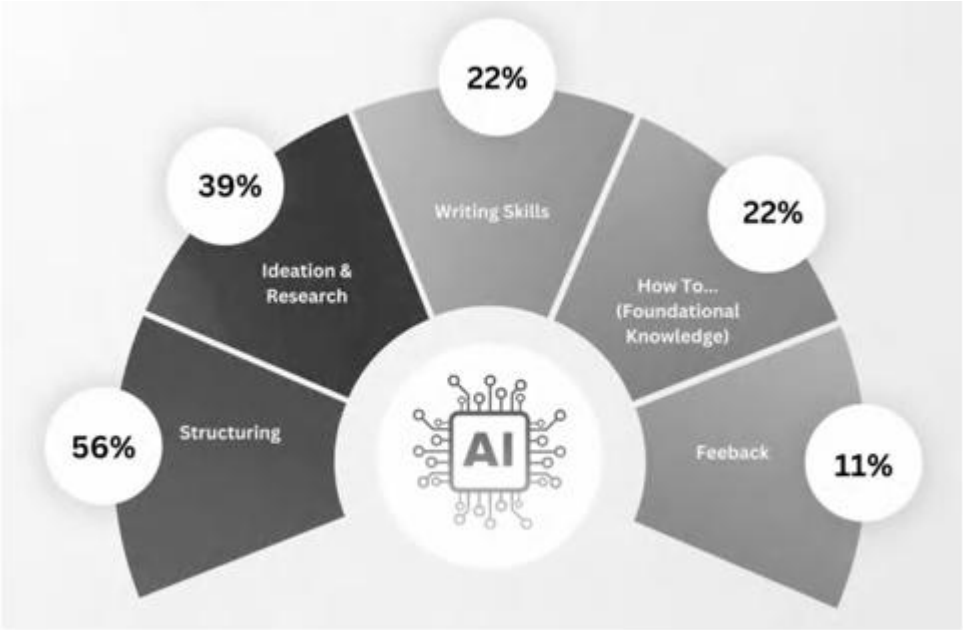


Figure 1 Student usage of generative AI for academic purposes (Beckingham et al., 2024).

In his seminal 1984 paper, Benjamin Bloom demonstrated that students receiving one-on-one tutoring performed two standard deviations better than their peers in conventional classroom settings a phenomenon known as the “Two Sigma Problem” (Bloom, 1984, 4.). However, the cost and impracticality of providing personal tutors for every student rendered this approach unsustainable for large-scale education systems.

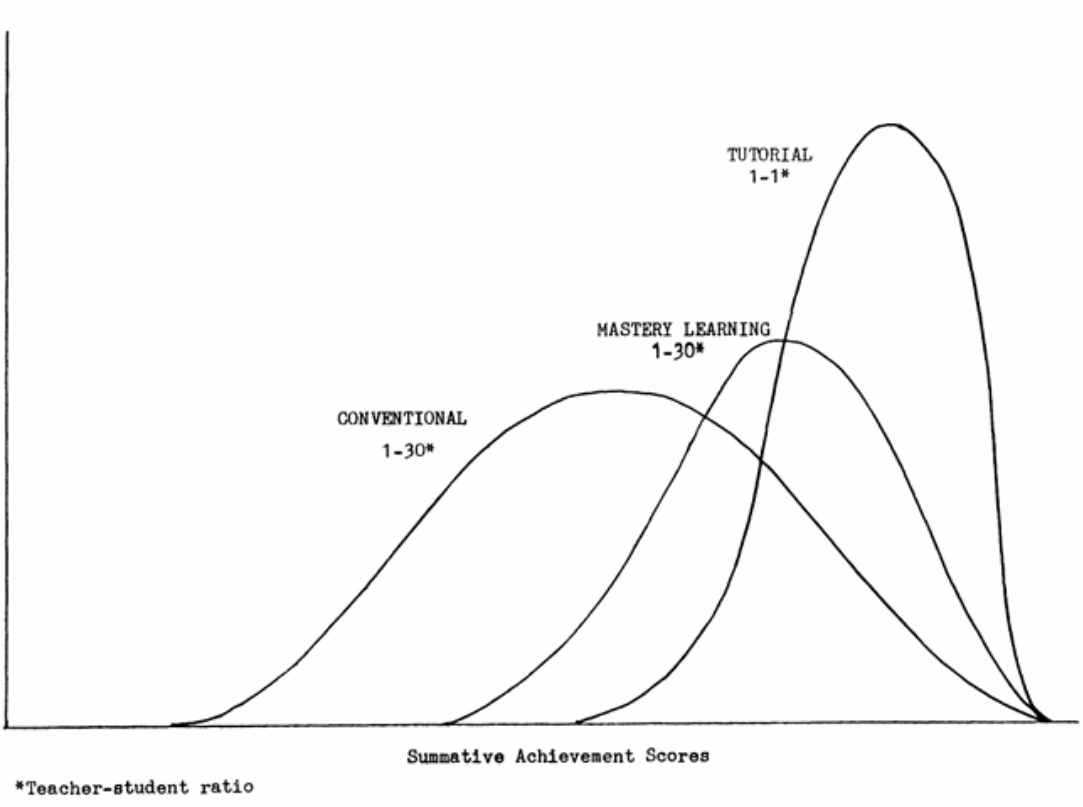


Figure 2 Comparison of conventional learning, mastery learning, and one-to-one tutoring showing the two-sigma effect.

Today, with the rise of generative AI tools and intelligent tutoring systems (ITS), researchers like Deckker & Sumanasekara (2024.) argue that AI may finally offer a scalable solution to Bloom's challenge. AI-driven feedback loops, adaptive content delivery, and real-time diagnostics offer a promising alternative to the high-cost model of personal tutoring, while still capturing many of its benefits (Deckker & Sumanasekara, 2024.).

## 1.2 Problem Statement

There exists a critical disjunction between the widespread use of AI tools by students and the lack of structured, ethical, and pedagogically sound institutional frameworks to govern this usage. Many students are unsure of what constitutes ethical usage, leading to academic grey zones and a diminished capacity for critical engagement. Without systemic interventions, these patterns could erode academic standards and deepen educational inequalities.

## 1.3 Objectives of the Study

### 1.3.1 General Objective

To examine the role of Artificial Intelligence in higher education from a student perspective, with emphasis on ethical usage, effectiveness, and readiness for integration into academic practices.

### 1.3.2 Specific Objectives

This study seeks to identify current patterns of AI usage among students in higher education. As AI tools such as *ChatGPT*, *Grammarly*, and *DeepL* become increasingly embedded in academic workflows, it is important to understand how frequently and for what purposes these technologies are employed. Particular attention is given to academic and creative tasks, including writing, summarizing, translation, and ideation.

Another core objective is to explore the underlying motivations that drive student engagement with AI, as well as the ethical perceptions that shape their usage behaviour. This includes investigating concerns related to plagiarism, overdependence, algorithmic bias, and data privacy. The research aims to uncover how students navigate these ethical challenges and whether institutional guidelines have influenced their decision-making processes.

Finally, the study evaluates the level of AI literacy among students by examining their ability to interpret, evaluate, and appropriately apply AI-generated content. Based on these findings, it proposes strategic recommendations for structured, student-centred integration of AI tools within higher education. These recommendations are aligned with global competency frameworks, including UNESCO's AI education guidelines, to ensure that AI use supports and not substitutes student learning and academic growth.

## 1.4 Research Questions

Understanding how students interact with AI tools in educational contexts requires a structured inquiry into both behavioural patterns and perceptions. This study is guided by a set of research questions aimed at uncovering not only the practical dimensions of AI use, such as frequency, purpose, and tool preference, but also the ethical, cognitive, and institutional challenges that accompany this adoption. These questions were developed to align with the study's objectives and to provide a comprehensive framework for data collection, analysis, and interpretation.

- How are students currently using AI in their academic tasks?
- What benefits and risks do students associate with AI tools?
- What ethical concerns do students encounter in using AI?
- What is the current level of student AI literacy?
- How can institutions develop responsible AI policies and frameworks?

## 1.5 Significance of the Study

This research addresses a key gap in the AI-in-education discourse by centering the student voice. While much literature explores institutional readiness or faculty attitudes, fewer studies delve into how students experience, perceive, and navigate AI-assisted learning environments (Valdiviezo Sir et al., 2024, 53.).

For students, this thesis offers practical insights into responsible AI usage and promotes AI literacy to prevent misuse or overdependence. For educators, it provides data-driven strategies to enhance alignment between course design and AI realities. For administrators, the findings support the formulation of transparent, ethical, and enforceable institutional policies (QUADC, 2024, 8.).

## 1.6 Scope and Delimitations

This study limits its focus to the student perspective and excludes AI applications used solely by faculty or administrative bodies. It investigates mainstream, widely available tools—e.g., *ChatGPT*, *Grammarly*, *DeepSeek*—within selected universities in Europe. It does not explore the technical architecture or programming of AI systems, focusing instead on usage behaviour, perceptions, and ethical concerns.

## 1.7 Definition of Terms

- Artificial Intelligence (AI): Digital systems designed to perform tasks requiring human-like cognition such as reasoning, writing, or problem-solving.
- Large Language Models (LLMs): Generative models trained on massive datasets capable of producing coherent, human-like text (e.g., GPT-4).
- AI Literacy: The skill set required to use, evaluate, and ethically integrate AI tools in academic settings (UNESCO, 2024, 48.).
- Academic Integrity: A commitment to honesty, originality, and ethical conduct in scholarly work.
- ARTISAN Project: An Erasmus+ initiative to foster ethical, creative, and critical AI competencies among university students.

# 2 Literature Review

## 2.1 Overview of Artificial Intelligence in Education

AI in education is computer programs that could perform tasks that normally require human intellectual processes such as reasoning, learning, and comprehending natural language (Wang, 2017). These programs have been increasingly utilized in educational institutions for automating grading, personalizing learning, and even replicating tutoring interactions.

But inherent questions persist: the ethical and social dimensions of the deployment of such systems. Binns et al. (2018:4) critically point out that algorithmic decision-making in education reduces students to data points, concealing the complexity of human learning and undermining fairness.

Aki Vainio (2024) further puts across that worldwide adoption of AI in education, although touted as a future, has the potential to neglect cultural, ethical, and pedagogical sensitivities. Vainio suggests that the wish for AI-based scalability can compromise relational and human values that constitute a good education. He emphasizes the need for AI to support good human aspects of learning, and not to replace them, and that its implementation must be guided by values such as equity, transparency, and critical pedagogy.

Collectively, these perspectives suggest that AI definition in education is not merely an issue of technical accuracy but also of ethical intent.

## 2.2 Evolution Of AI in Education

Application of Artificial Intelligence in education has evolved significantly, from early rule-based solutions towards generative dynamics that are tailored for one-to-one interaction.

The early description of AI's use in education was rule-based tutoring systems and adaptive quizzes. These were programmed systems with pre-programmed logic paths and could only respond to pre-programmed in-puts. They worked for low-grade subjects but were inflexible and not granular (Deckker & Sumanasekara, 2024.).

The 1990s and early 2000s welcomed the Intelligent Tutoring Systems (ITS) as the new benchmark. Domain models and student profiles were utilized by these systems to give more intelligent guidance and feedback. They pointed towards more interactive and context-aware electronic instruction (As'ad, 2024.).

The next revolutionary phase appeared with the emergence of Large Language Models (LLMs), particularly after 2020. Unlike their predecessors, LLMs like GPT-4 have learned from massive datasets and are capable of emulating human-like speech, generating learning content, and adapting to various

learner needs in real-time (Dyde, 2023.). Such models are paradigmatic cases of moving away from automation and towards cognitive extension.

The COVID-19 pandemic accelerated the adoption of AI in education at a record pace, as schools turned to AI tools to augment online learning. This spurred the mass adoption of generative models in standard pedagogy and underscored the need for scalable, personalized learning technologies (Beckingham et al., 2024.).

This evolution from stationary automaton to dynamic enhancement depicts how AI has shifted from a tool to a cognitive partner in education today, making scalable 1-on-1 support a reality, something previously unimaginable.

## 2.3 Types of AI Tools Used by Students

The use of Artificial Intelligence (AI) in higher education has expanded significantly in recent years, particularly with the advent of user-friendly, web-based platforms. Students are increasingly integrating various AI tools into their academic routines to enhance learning, manage time, and automate repetitive tasks. These tools generally fall into four major categories: generative, analytic, assistive, and organizational.

### 2.3.1 Generative AI Tools

Generative AI programs are perhaps most utilized in the educational setting. They include programs such as *ChatGPT*, *Claude*, and *DeepSeek* that employ Large Language Models (LLMs) to generate text-based outputs that closely resembles to human authorship. They assist students with writing guidance, idea generation, summarizing texts, and even elucidating complicated concepts (Khan, 2024, 14.).

What characterizes generative tools is that they are multi-purpose. *ChatGPT*, for instance, is utilized simultaneously as a writing editor, study companion, coding collaborator, and language translator. This scope of uses reduces the need for several apps, an amalgamation of what were once separate scholarly aids in a singular system (QUADC, 2024, 6.). This is one aspect of an overarching trend of "cognitive outsourcing," where students are utilizing AI systems to outsource cognitive and planning tasks.

### 2.3.2 Analytic AI Tools

Analytic AI tools are used primarily for performance evaluation, identifying learning gaps, and ensuring academic standards. Examples include plagiarism detection websites like Turnitin and Copy

leaks, and institutional Learning Management Systems (LMS) that use predictive analytics for disengagement identification and intervention suggestions. These tools allow instructors and administrators to track academic progress and intervene as necessary, which renders them invaluable to student success initiatives (QUADC, 2024, 5.).

Despite their utility, analytic AI systems have also raised significant privacy concerns on behalf of students. Many feel uneasy about AI-powered proctoring and monitoring tools that record sensitive data without apparent consent. In a policy brief, the National Education Policy Centre warns that surveillance-based technologies can "do more harm than good" when introduced into academic settings without adequate oversight, especially when they entrench mistrust and reduce psychological safety (Williamson et al., 2024.).

Similarly, Beckingham et al. (2024) emphasize that the ethical implementation of AI must be founded on informed consent, transparency, and student agency. Excessive surveillance, they argue, erodes academic trust and autonomy, especially when AI is used in grading, detection, or feedback systems without consultation with learners. These findings indicate that while analytic AI tools yield functional benefits, their use must be balanced with robust ethical and governance frameworks.

### 2.3.3 Assistive AI Tools

Assistive artificial intelligence technology helps students overcome hearing, language, or learning disabilities. Some examples include recognition software such as Otter.ai and dictation tools improving notetaking and student access to disability. Google Translate and *DeepL* are often used for providing language support in multilingual learning environments.

Empirical research has confirmed that ASR improves oral fluency and phonological accuracy for non-native English speakers (Jiang et al., 2023, 128.). Additionally, applications like *Grammarly* employ AI to improve writing style, grammar, and vocabulary usage, especially in students who are building academic writing skills in a second language.

### 2.3.4 Organizational Tools

AI also has a growing role in task and time management. Tools such as Notion AI, Reclaim.ai, and Microsoft Copilot assist students in planning study sessions, setting priorities, and developing revision plans based on performance data. Students with multiple deadlines to meet or part-time studying with work find these tools especially welcome.

Coetzee reports that 59% of students in the survey agrees that AI enhances their productivity and efficiency " (Coetzee, 2025, 7.). This aligns with the purpose of organizational tools—to simplify productivity and focus, not necessarily content creation.

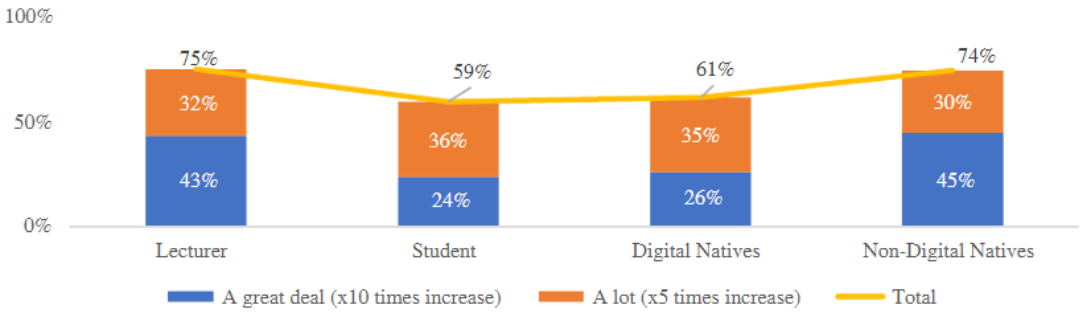


Figure 3 Artificial Intelligence tools enhance productivity and efficiency (Coetzee 2025, 7.)

### 2.3.5 Multifunctionality

AI tools exhibit multifunctionality, serving as integrated platforms that streamline diverse academic tasks such as translation, summarization, and idea generation. Their convergence into singular interfaces enhances user efficiency, though this functional overlap also raises pedagogical questions around compartmentalized skill development.

## 2.4 Benefits of AI for Higher Education Students

The future of AI is in the potential to make learning personalized, more engaging, and real-time feedback-providing. AI systems can analyse how students learn and tailor material to them.

LLMs mimic the benefits of human tutoring. Bloom's "Two Sigma Problem" intimated that tutoring one-to-one has superior results, hence, scalable approximations come from AI (Deckker & Sumanasekara, 2024, 4.). In addition, predictive analytics can identify students at risk of academic failure prior to their failing academically, allowing early intervention (QUADC, 2024, 5.).

AI also enables multilingual learning, enables disabled students, and supports international students by enabling translation and adaptive interfaces.

## 2.5 Challenges of AI Adoption Among Students

Despite these benefits several barriers to effective AI adoption persist.

### 2.5.1 AI Literacy

Without proper skills needed to critique AI-generated work, students will wind up disseminating misinformation or using AI as a crutch rather than a learning aid.

This AI illiteracy is also compounded by institutional lack of training schemes and course-integrated curriculum. The UNESCO AI Competency Framework (2024) itself highlights the need for "Human Oversight" and emphasizes that learners should not sacrifice cognitive agency when using AI systems (UNESCO, 2024). Nevertheless, competency-based AI education has not yet been embraced by most institutions, leaving students to self-learn such technical and ethical subtleties. The result is an educational environment where convenience can dominate the learning process, and academic quality is compromised.

### 2.5.2 Digital Inequality

Students in rural or underfunded regions may lack access to AI tools, exacerbating the digital divide. Inconsistent internet access and limited device compatibility continue to limit equitable AI engagement (Generale et al., 2024).

Beyond hardware access, digital literacy training is often absent in institutions serving disadvantaged communities. As a result, even when AI access is technically available, students may lack the skills or institutional support needed to use these tools effectively. This was echoed in UNESCO's call for equitable AI integration, urging institutions to address the systemic gaps that prevent full participation in digital education (UNESCO, 2024, 35.). Without targeted policy interventions and support structures, digital inequality in AI access will continue to hinder inclusive education and exacerbate academic disparities.

### 2.5.3 Psychological Resistance

Psychological resistance to AI technologies in educational settings is increasingly reported, particularly in relation to surveillance-based tools. AI-powered proctoring systems, plagiarism detection software, and predictive analytics platforms can create a sense of constant monitoring that undermines student comfort and autonomy. A growing number of students express discomfort with being "watched" by AI systems and are concerned about how their data is used and stored. According to the National Education Policy Centre (Williamson et al., 2024.), such surveillance can "do more harm than good," creating environments of mistrust rather than academic support.

Furthermore, Beckingham et al. (2024) caution that ethical AI integration requires transparency and student agency. When AI is used for grading or behavioural analysis without informed consent, stu-

dents feel that their autonomy is diminished, and their academic voice is reduced to algorithmic interpretation. These findings reinforce the importance of human-in-the-loop frameworks, where student rights and consent remain at the centre of any AI-based educational policy.

### 2.5.4 Overdependence

AI tools are widely recognized for their efficiency, but this very convenience can inadvertently foster overdependence and suppress the development of independent thinking skills. When students regularly turn to AI for tasks such as paraphrasing, outlining, or translating, they risk bypassing essential stages of critical engagement and reflection. Niloy et al. (2023) report that sustained use of AI in academic writing is associated with measurable declines in originality and problem-solving ability, suggesting that heavy reliance on automation may gradually erode students' capacity for analytical reasoning and authentic expression.

This concern becomes more acute when students accept AI-generated outputs at face value without verification or modification. Interviews conducted for this study revealed that many students admitted to using AI tools primarily to "get things done faster," even when they were aware that the output was suboptimal or misaligned with academic expectations. This behaviour indicates a growing preference for expediency over deep learning. UNESCO (2024) explicitly cautions against this trend, asserting that AI should serve as a supportive enhancement to student learning and not a replacement for human cognition, creativity, or academic responsibility.

## 2.6 Ethical Considerations of AI Usage

The integration of Artificial Intelligence (AI) tools into higher education raises a complex spectrum of ethical considerations, ranging from data privacy to academic integrity. As students increasingly engage with generative AI systems such as *ChatGPT*, *Grammarly*, and *DeepL*, there is a pressing need to frame these interactions within clear ethical boundaries.

This section explores these considerations through both empirical findings and the globally endorsed UNESCO AI Competency Framework for Students (2024**)**, which outlines essential cognitive, behavioural, and ethical skills for responsible AI engagement. AI integration raises fundamental questions of academic integrity, bias, and transparency. The most pressing concerns include:

- Algorithmic Bias: AI systems may replicate societal biases, especially in grading, admissions, and student assessment. Fairness and transparency in algorithm design are critical.

- Plagiarism and Authorship: Students may unintentionally commit academic misconduct when using AI-generated content without disclosure. Reflective use and AI declaration are vital to preserve academic honesty (Beckingham et al., 2024).
- Data Privacy: AI tools process vast amounts of student data, posing risks of unauthorized use or breaches. Encryption, consent, and transparent data practices must be prioritized (Ahmad et al., 2020).
- Mental Health & Autonomy**:** Over-surveillance and reduction of meaningful human interaction can lead to stress, anxiety, and reduced motivation.

Ethical frameworks from organizations like UNESCO are emerging, but widespread implementation across institutions remains inconsistent.

### 2.6.1 UNESCO AI Competency Framework: A Global Ethical Blueprint

To address this gap, the UNESCO AI Competency Framework for Students (2024) provides a structured foundation of ethical and functional AI literacy, which is increasingly being adopted across universities. Pages 29–35 of the framework outline clear objectives under categories like:

- Human Agency and Oversight (CG4.1.1.1)
  “UNESCO emphasizes that AI in education must enhance rather than substitute students' independent reasoning and decision-making processes (2024, 30.).”
- Ethics, Bias, and Fairness (CG4.2.2.1)
  Advocates for understanding how algorithmic bias can marginalize certain populations and calls for student awareness in recognizing these biases.
- Transparency and Explainability (CG4.2.1.1)
  Encourage students to question how AI tools arrive at answers and to avoid blind acceptance of outputs.
- Data Privacy and Consent (CG4.2.3.1)
  Promotes respect for personal and institutional data rights and discourages feeding sensitive information into unsecured AI platforms.
- Responsible Usage (CG4.3.1.1)
  Reinforces the need for AI tools to complement and not substitute human creativity, reasoning, and ethics.

These core principles align closely with this study’s findings, especially students’ concerns about autonomy and dependence.

“Imagine two students get similar AI outputs, whose voice is it really?” asked one student, echoing the UNESCO principle of authorship responsibility (UNESCO, 2024).

### 2.6.2 Gaps Between Framework and Practice

While the UNESCO framework offers a robust foundation, this research indicates that students are often:

- Unaware of these global standards
- Operating without institutional scaffolding to apply such principles
- Unsure how to balance tool use with ethical integrity

As such, the data reveals a significant gap between ethical intentions and applied practice, underscoring the need for educational institutions to not just endorse frameworks, but actively teach and embed them.

### 2.6.3 Call for Integration in Higher Education

This ethical tension highlights the need for curriculum-level integration of AI ethics, modelled after the UNESCO framework. Institutions should:

- Develop AI literacy modules that cover the competencies outlined on pages 29–35
- Create case studies and assignments that ask students to analyse ethical scenarios
- Encourage self-reflection on tool usage, authorship, and fairness

As UNESCO (2024) asserts, “AI education must be human-centred and future-oriented,” ensuring students not only use AI competently, but ethically and equitably.

# 3 Research Methodology

## 3.1 Research Approach and Design

It employed a convergent mixed-methods design, combining quantitative survey results with qualitative interview results. It aimed to create a holistic understanding of how students in higher education make use of Artificial Intelligence (AI) technologies, the ethical concerns they associate with such usage, and their expectations of institutional integration.

The quantitative component was an e-questionnaire distributed among the students across various study departments, whereas the qualitative component consisted of semi-structured interviews with nine students and one AI instructor. This combination of approach permitted triangulation of findings through comparison of patterns in statistical data against participants lived experiences and narratives.

The primary data collection tool for this research was Microsoft Office Forms, selected due to its extreme availability, ease of use, and ability to offer anonymous interaction. As the population being researched was university students, Microsoft Office Forms offered an interface with which most respondents were already familiar, reducing the potential for technical issues or in-completion. Furthermore, its mobile and cloud-based deployment enabled mass access through media like WhatsApp, email groups, and online student discussion forums, optimizing participation across diverse educational profiles. Its built-in analytics also enabled monitoring data at initial stages without compromising on privacy.

## 3.2 Target Population and Sampling Techniques

The target population was university students in European higher education institutions who had access to and had used AI tools in academic contexts. The sample was obtained through purposive convenience sampling, emphasizing accessibility and relevance to the topic.

- Survey sample size: 111 respondents
- Interview sample size: 9 students + 1 AI educator
- Fields represented included IT, business, international studies, engineering, and social sciences.

## 3.3 Data Collection Methods

### 3.3.1 Online Survey

The online questionnaire was distributed using Google Forms. It included a mix of closed-ended and Likert-scale questions to assess:

- Frequency and context of AI use
- AI tools used and for what tasks
- Ethical concerns (academic integrity, bias, privacy)
- Student perception of institutional guidance and policies
- Future integration expectations

The survey received 111 valid responses between April 15 and May 11, 2025.

### 3.3.2 Interviews

Semi-structured interviews were conducted with 9 students and 1 educator. Interviews followed a pre-defined 7-question guide focused on AI tool usage, ethical concerns, underutilized areas, institutional expectations, and future aspirations. Interviews were recorded, transcribed, and thematically coded. The questions were posed and aimed at exploring students' and the educator’s perspectives on:

- Current usage patterns
- Perceptions of creativity and productivity
- Unused potential of AI
- Ethical perspectives
- Institutional expectations
- Future aspirations

These interviews were conducted via video call, audio-recorded with consent, and transcribed verbatim. They were analysed using thematic coding. The utilization of a mixed methods design in this study was purposeful and strategic. Quantitative data from the online survey enabled measurable data on how often and how students use AI tools, with the possibility of trend analysis with a bigger

sample. On the other hand, qualitative interviews yielded deep, personal reflections and ethical considerations that would otherwise be buried in quantitative data. Together, the research would be able to investigate not just what students do with AI, but why they do it. This depth was necessary for investigating the nuanced ethical, affective, and pedagogical dimensions of AI adoption in education. Also, this methodological triangulation enhanced the validity of the findings since it cross-checked themes across different sources of data.

## 3.4 Research Instruments and Measures

To collect both quantitative and qualitative data relevant to the study's objectives, a mixed-methods instrument design was employed. The primary tools included a structured survey and a semi-structured interview protocol, each tailored to capture distinct but complementary dimensions of student interaction with AI in higher education. The instruments were refined through pilot testing to ensure clarity, appropriateness, and alignment with research goals, enhancing their effectiveness in eliciting meaningful responses.

- Survey: Contained 30 items, including Likert-scale questions (1–5), checkboxes, and open-text prompts.
- Interview Protocol: Based on open-ended, thematic prompts (see Appendix).
- Pilot Testing: The survey was piloted with 5 students to refine language and timing.

## 3.5 Ensuring Validity and Reliability

Various strategies were implemented to uphold validity and reliability standards, including pre-survey review by academic supervisors, consistency testing of scaled items, and rigorous qualitative coding. These measures ensured that the instruments captured relevant constructs accurately and that the interpretation of results was methodologically sound.

- Internal Consistency: Survey items measuring ethical concern and AI perception were evaluated using Cronbach’s Alpha (>0.7 threshold).
- Instrument Validity: Survey and interview instruments were reviewed by two research supervisors for content validity.
- Credibility (Qualitative): Cross-validation between interviews and survey themes ensured thematic convergence.
- Dependability: Clear coding protocols and audit trail maintained in thematic analysis.

## 3.6 Data Analysis Techniques

### 3.6.1 Quantitative Analysis

To gain a broad understanding of how students engage with AI tools, this study utilized quantitative methods to examine usage patterns, ethical perceptions, and institutional readiness. The survey data, collected from a diverse sample of higher education students, was analysed using descriptive statistics to reveal trends in tool adoption, frequency of use, and levels of concern regarding ethical issues. This approach provided a foundational overview of student behaviour and perceptions, which informed subsequent qualitative insights and comparative frameworks such as the UNESCO AI Competency model.

- Descriptive statistics were used to analyse frequency of AI usage, tool preference, and ethical concern.
- Visualizations (bar charts, tables) were generated using Excel and Seaborn libraries.
- Data categories included: academic tasks supported by AI, institutional policies, and future integration preferences.

### 3.6.2 Qualitative Analysis

The 9 student and 1 educator interviews were subjected to thematic analysis using the following procedure:

1. Initial Coding: Responses were coded line-by-line to identify significant phrases.
2. Focused Coding: Themes were grouped under 5 major categories:
    - AI usage domains
    - Creativity vs automation tension
    - Ethical dilemmas
    - Institutional support needs
    - Aspirations for future AI design
3. Pattern Recognition: Themes were tallied across participants. For example:

- All 9 students mentioned "creativity boost" but 6 also raised "lack of originality."
- 7 students emphasized the need for "ethical guidance workshops."
- 4 students highlighted "accessibility barriers" and asked for AI tools integrated with curricula.

Educator insights mirrored these concerns, emphasizing the gap between student enthusiasm and institutional readiness.

## 3.7 Ethical Data Protection Considerations

This study was conducted in accordance with the LAB University of Applied Sciences ethical research guidelines:

- Ethical Clearance was granted under LAB University research protocols.
- Informed Consent was obtained from all participants via a digital form.
- Data Confidentiality: All personal identifiers were removed; responses were stored securely and analysed anonymously.
- GDPR Compliance: Data collection, storage, and reporting aligned with EU General Data Protection Regulation standards.
- Voluntary Participation: All respondents were informed they could withdraw at any stage without consequence.

## 3.8 Artificial Intelligence use Disclosure.

This thesis utilized AI tools (*ChatGPT*-4, *Grammarly*, and *DeepL*) to assist with brainstorming, paraphrasing, and refining academic language. All sources were verified manually. AI outputs were critically reviewed and edited by the authors. This use aligns with the ethical guidelines discussed in Chapter 2.6 and UNESCO's AI Competency Framework (2024:31).

# 4 Results and Discussion

## 4.1 Analysis of AI Usage Among Students

The survey showed that 90% of students use AI tools at least occasionally in their academic work. The distribution is as follows:

- Occasionally (1–2 times per week): 39%
- Frequently (3–5 times per week): 31%
- Very Frequently (daily): 20%
- Rarely (1–2 times per month): 10%

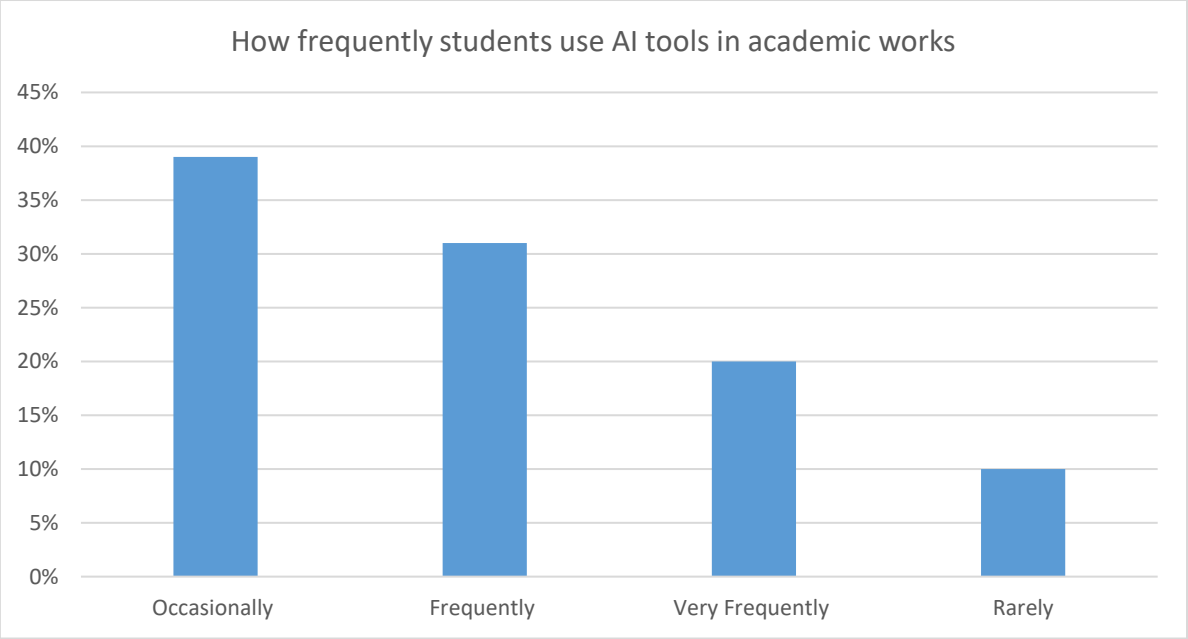


Figure 4 How Frequently Students Use AI Tools in Their Academic Work

These numbers reflect how embedded AI has become in students' daily routines. Tools like *ChatGPT*, *Grammarly*, *DeepL*, and Notion AI are commonly used to help with writing, summarizing, translating, and managing time. These trends align with findings from Beckingham et al. (2024), who observed that AI has shifted from optional enhancement to everyday necessity across UK universities.

## 4.2 Benefits Experienced by Students Using AI

Students overwhelmingly identified specific academic benefits:

- Time saving (93%)
- Improved assignment quality (91%)
- Learning new approaches (91%)
- Overcoming knowledge gaps (90%)
- Generating creative ideas (87%)

These results reinforce the assertion that generative AI builds student confidence by breaking difficult ideas into manageable steps. It is not just a productivity tool; it serves as a thinking partner, thereby broadening the way students tackle academic challenges.

"I now use AI at the beginning of every paper to brainstorm the structure it helps me get started faster." – Student 2

"*Grammarly* and *DeepL* make me more confident with writing in English, especially technical terms." – Student 6

This strong reliance on AI for ideation, language refinement, and clarity affirms the central role of generative tools in today's student workflow.

## 4.3 Ethical Concerns and Responsible

Despite AI's benefits, ethical concerns are significant. When asked to rate their level of concern (on a scale from 1 to 5), a large percentage of students chose 4 or 5 for the following issues:

| Ethical Concern | % Rating High Concern (4–5) |
|---|---|
| Over-reliance on AI tools | 71% |
| Reduced critical thinking | 70% |
| Data privacy risks | 68% |
| Academic integrity | 64% |
| Potential AI bias | 62% |

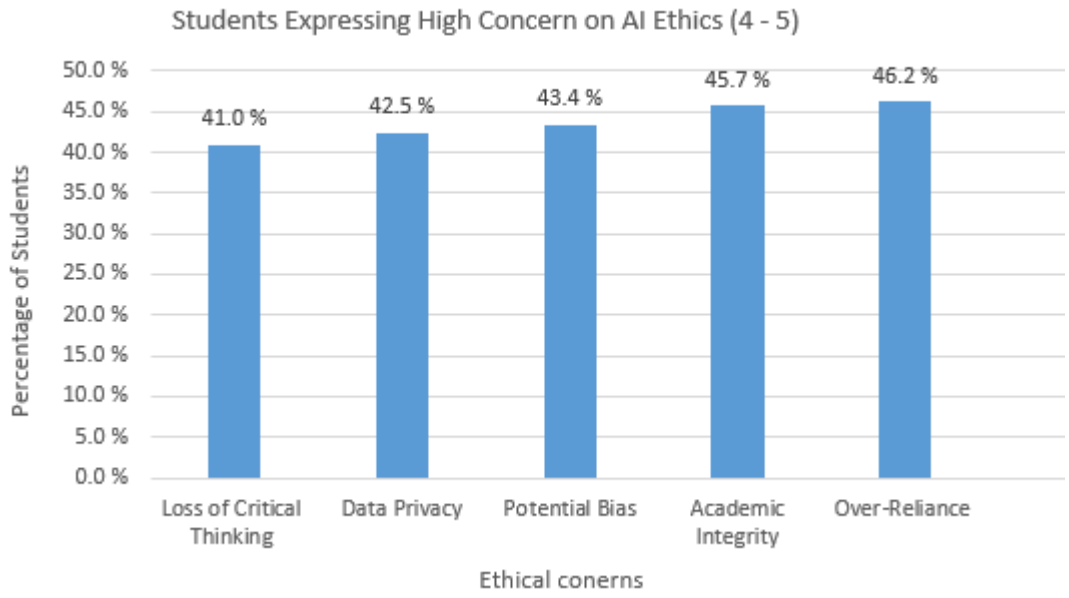


Figure 5 Students Expressing High Concern on AI Ethics

These findings echo Beckingham et al. (2024), who noted that while students are aware of ethical pitfalls, many lack the institutional support to navigate them. UNESCO's AI Framework (2021) similarly calls for stronger student training in evaluating the credibility and fairness of AI outputs.

"I'm scared that I might plagiarize unintentionally... Sometimes AI writes so smoothly I forget to edit." – Student 4

"I always cross-check facts, but it takes time. Not everyone knows how to verify properly." – Student 1

The data suggests that while AI literacy is improving, it remains uneven—especially when it comes to ethical use.

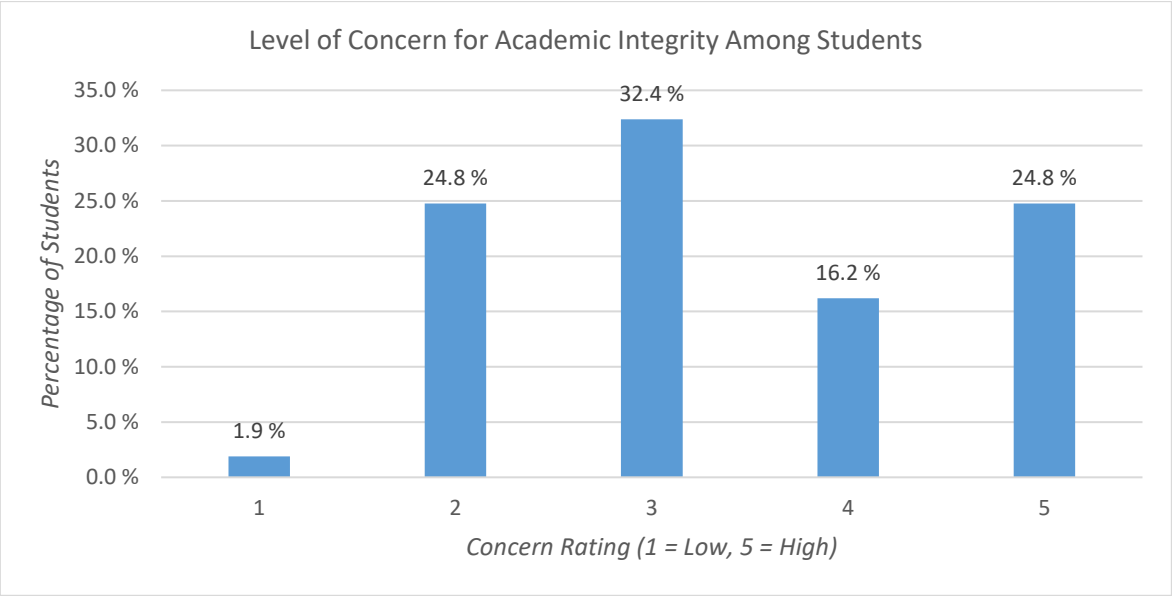


Figure 6 Percentage of Students by Concern Level for Academic Integrity

From the 105 responses:

- 1.9% of students expressed no concern (rating 1),
- 24.8% selected rating 2 (low concern),
- 32.4% gave a moderate concern rating of 3,
- A substantial 41% rated their concern at 4 or 5, indicating high concern.

This means nearly half of all students recognize the potential academic risks of unregulated AI usage, particularly with tools that generate essays, summaries, or solve assignments. This aligns with findings by Beckingham et al. (2024), who noted that students often feel conflicted about originality when using AI as a co-author or tutor in their academic work.

“I sometimes wonder if the final output is even mine anymore,” one student reflected.

These responses reinforce that ethical literacy is not merely an institutional compliance issue, but a personal dilemma, students are already navigating.

A parallel analysis of “Over-reliance on AI tools” revealed similar trends. More than 40% of students rated their concern as 4 or 5, while only 1% reported no concern. The data indicates strong student awareness of becoming dependent on AI for tasks such as brainstorming, essay structuring, or even critical thinking.

This echoes the concerns raised by Valdiviezo Sir et al. (2024) who argue that “AI may amplify learned helplessness” if it is treated as a replacement rather than an enhancement of human cognition.

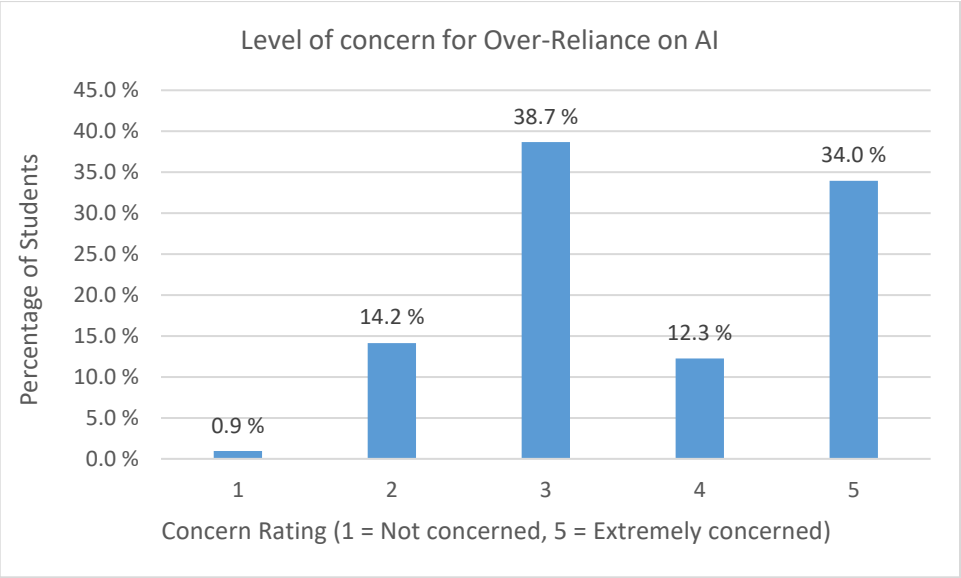


Figure 7 Percentage of Students by Concern Level for Over-Reliance on AI

In the interviews, students expanded on these survey themes. Common sentiments included:

- Worry about losing originality or independent voice.
- Uncertainty around what constitutes AI plagiarism.
- Pressure to use AI because others do, even if they feel ethically conflicted.

One student noted:

"I want to be ethical, but I also don't want to fall behind when others are using AI to optimize everything."

These insights point to a critical need: institutions must not assume ethical concerns are absent just because policies are unclear. Instead, they must recognize that students are forming their own ethical codes and would benefit from structured, student-informed ethical AI literacy programs.

### 4.3.1 Student Agency and Human Oversight (CG4.1.1.1)

A recurring theme from the interviews was that students actively edit, refine, or completely rewrite AI outputs before submission. This reflects a deliberate effort to preserve human agency, consistent with UNESCO's principle that "AI should assist, not replace student judgment" (UNESCO, 2024, 30.).

"I use AI to help start writing, but I never submit it directly." — Student 2
"I always edit AI responses—just using them as a first step." — Student 6

This agency in content creation indicates an encouraging trend: students are not blindly outsourcing academic work to AI but are instead engaging with it as a cognitive partner. This supports findings by Beckingham et al. (2024) and confirms positive alignment with the UNESCO competency CG4.1.1.1.

### 4.3.2 Over-Reliance and Critical Thinking Risk (CG4.3.1.1)

Survey results show that 46% of respondents rated concern about reduced critical thinking at 4 or 5 on a Likert scale. A similar percentage emerged regarding over-reliance on AI tools. This suggests a high level of student awareness about potential dependency.

"Although AI tools are helpful, I sometimes question whether they reduce the depth of my cognitive engagement." — Student 5

This ethical self-awareness mirrors UNESCO's call for balanced tool usage and human reasoning retention (UNESCO, 2024, 31.). These student-derived ethical concerns find both reinforcement and divergence when compared against established scholarly literature, as explored in the next section.

## 4.4 Comparison with Existing Studies

To contextualize this study's findings, it is essential to compare the outcomes with established literature and empirical research. The results obtained particularly on student usage, ethical concerns, and institutional gaps closely mirror themes found across international research.

### 4.4.1 AI Usage and Benefits: Confirming Prior Trends

Students in this study reported using AI tools frequently for academic and creative purposes including structuring essays, translating content, idea generation, and task management. This echoes patterns documented in Beckingham et al. (2024), where over 50% of surveyed students reported using AI primarily for structuring and ideation.

Similarly, Valdiviezo Sir et al. (2024, 55.) identified *ChatGPT*, *Grammarly*, and Notion as the most frequently used AI tools in European universities. Both sources highlight AI's role as a supplementary cognitive agent rather than a standalone tutor.

Notably, over 60% of students in this study reported that AI had improved their productivity and confidence when working independently aligning with literature from QUADC (2024, 5.), which

emphasizes AI's potential for personalized feedback and motivation in self-directed learning environments.

### 4.4.2 Ethical Awareness: Student-Centric Moral Reasoning

The ethical dimension of AI use, being a central concern in this study is also widely reflected in contemporary research. In this study, more than 40% of students indicated high concern about academic integrity and over-reliance on AI tools. These concerns were qualitatively echoed by interviewees, who described conflicting emotions about where human creativity ends and AI authorship begins.

This reflects earlier warnings by Beckingham et al. (2024) that without proper guidance, students' risk unknowingly breaching academic ethics or becoming passive recipients of AI-generated thought. The issue is not limited to honesty alone but serious concerns about reduced critical thinking and algorithmic bias were also frequently cited in both this research and that of (Williamson et al., 2024.), which cautions that unregulated AI adoption may "do more harm than good."

### 4.4.3 Institutional Gaps: An Ongoing Global Dilemma

Perhaps most significantly, this study found a substantial disconnect between student AI adoption and institutional policy readiness. Over 58% of surveyed students said their universities lacked clear guidelines or structured training on ethical AI use.

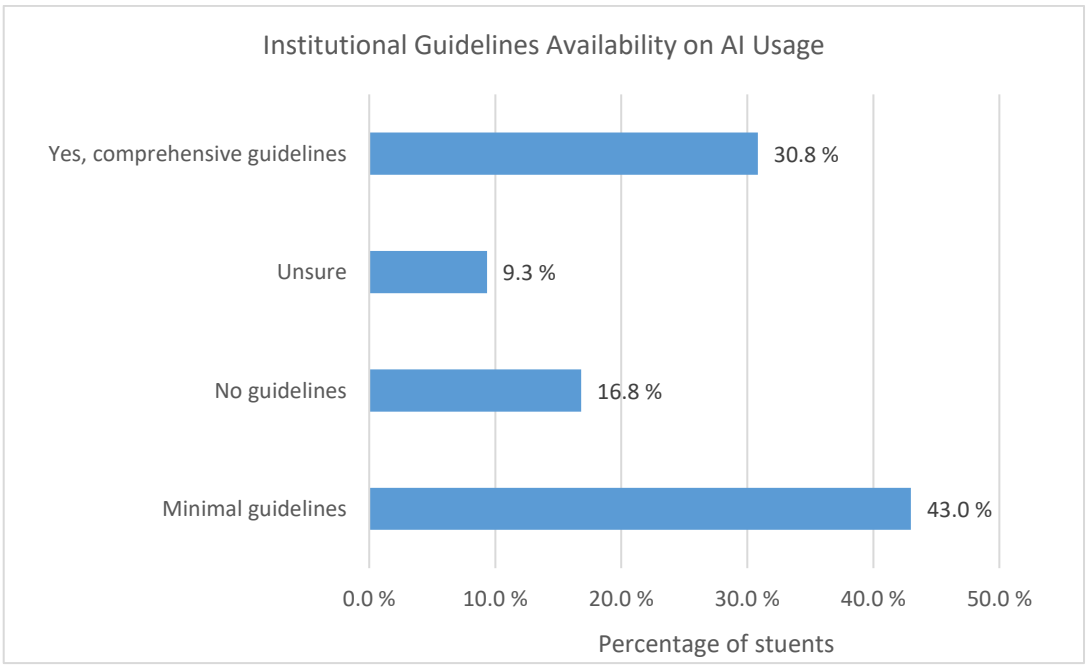


Figure 8 Percentage of students with institutional guidelines on AI usage

This is not a localized issue. The UNESCO Beijing Consensus (2019, 10–11.), calls for urgent development of institutional AI governance, teacher competencies, and national strategies for AI in education. Yet progress has been slow, especially at the course delivery level.

QUADC (2024, 14.) highlights that while predictive analytics and learning dashboards are being tested, many institutions are still unprepared to integrate tools like *ChatGPT* or AI writing assistants in a pedagogically sound manner. This validates the need for bottom-up policy development that incorporates student voices, practical use cases, and ethical boundaries.

### 4.4.4 Bias, Fairness, and Transparency (CG4.2.2.1)

From the survey, 44% of students expressed high concern about potential AI bias or lack of transparency. Although this is slightly lower than plagiarism or over-reliance concerns, it remains significant.

“Sometimes I wonder how these tools decide what’s accurate. It’s not always obvious.” — Student 3

This lower emphasis on bias implies a gap in AI literacy of which UNESCO (2024, 31.) explicitly warns against. Integrating awareness training on algorithmic bias and fairness into academic modules could help bridge this knowledge gap.

This observation echoes findings from the National Education Policy Centre (Williamson et al., 2024.), which emphasizes that unchecked algorithmic tools can deepen educational inequalities when students don’t critically assess outputs.

## 4.5 Summary of Findings

Through the triangulation of quantitative survey data (n=111) and qualitative interviews (9 students, 1 educator), the findings reveal a nuanced, informed, and *DeepL* reflective student relationship with AI.

### 4.5.1 Students Are Active AI Users Across Diverse Tasks

An overwhelming majority of students (nearly 65%) reported using AI tools such as *ChatGPT*, *Grammarly*, *DeepL*, and Notion at least 2–3 times a week. These tools are predominantly employed for:

- Structuring academic work
- Idea generation and brainstorming
- Clarifying language and translations
- Drafting written content

Students described AI as a tool that saves time and improves confidence, especially in the early phases of academic writing. This aligns closely with findings from Beckingham et al. (2024) and Valdiviezo Sir et al. (2024), both of whom highlight the broad uptake of AI across academic functions.

### 4.5.2 Perceived Benefits Include Speed, Clarity, and Autonomy

When asked about benefits, over 70% of students agreed or strongly agreed that AI tools help them:

- Work more efficiently
- Improve the structure of their work
- Gain quick access to information
- Enhance self-directed learning

Interview responses reinforced these benefits:

"*ChatGPT* helps me overcome difficulties initiating academic writing. It accelerates my ability to begin tasks I might otherwise delay." — Student 3
"*Grammarly* and *DeepL* save me hours when switching between languages." — Student 7

These experiences suggest that AI is not merely a technical tool but a cognitive amplifier that help students enhance ideation, organization, and linguistic clarity.

### 4.5.3 Ethical Awareness Is High Especially on Integrity and Critical Thinking

The ethical concerns surrounding AI use were not only present but actively articulated by students. More than 40% expressed high concern (rating 4 or 5) across issues such as:

- Plagiarism and originality

- Over-dependence on AI
- Loss of critical thinking skills
- Data privacy and algorithmic bias

Interview responses highlighted that students often feel caught between:

- The desire to use AI responsibly
- And the pressure to stay competitive when others use it unchecked

“I’m worried we’re becoming too comfortable relying on AI. It’s like training wheels that never come off.” — Student 6

Such statements reflect not only concern but also a desire for ethical clarity and cultural norms, which institutions are yet to provide at scale.

### 4.5.4 Institutional Support Is Lagging Behind Student Adoption

Perhaps the most striking theme is the gap between student readiness and institutional preparedness.

- Over 58% of students reported that their university had no clear guidelines on AI usage.
- Interviews and surveys both pointed to a desire for structured support such as:
    - Short courses on AI literacy
    - Guidelines on responsible use
    - Clear policies on ethical academic boundaries

The absence of such frameworks reinforces what the UNESCO Beijing Consensus (2019) and QUADC (2024) identify as a global challenge: policies are not evolving at the same pace as technology adoption.

### 4.5.5 Students Want a Guided but Flexible AI Future

Finally, students consistently expressed a forward-thinking attitude toward AI in education. They do not want AI banned or strictly regulated instead; they want:

- Integration of AI into coursework
- Frameworks that encourage ethical use, not fear-driven restrictions
- Space to explore new AI tools as they emerge

“Give us the tools and the trust — then set the ethical boundaries. That’s what we want.” — Student 9

This future-oriented thinking echoes the policy calls of Beckingham et al. (2024) and UNESCO (2019), both of whom recommend student-involved AI governance models in higher education.

## 4.6 Student Practices vs UNESCO Competency Benchmarks

The integration of UNESCO’s AI Competency Framework into this study provides a useful lens for evaluating the ethical and cognitive readiness of students in their AI usage. By comparing survey findings and interview insights with UNESCO’s outlined competencies, the table below synthesizes key areas of alignment and gaps, highlighting where students demonstrate responsible engagement and where targeted institutional support remains necessary.

| UNESCO Competency | Evidence from This Study | Interpretation |
|---|---|---|
| CG4.1.1.1 Human Oversight | 61% review AI output before submission | Students retain agency in output curation |
| CG4.2.2.1 Algorithmic Bias Awareness | 37% concern about AI fairness and accuracy | Partial awareness: requires curricular reinforcement |
| CG4.2.3.1 Data Privacy | 44% show strong concern; few know policies | Institutions must address privacy education |
| CG4.3.1.1 Responsible Use | 41% worry about over-reliance; mixed practices observed | Ethical intention is present; practical skills are limited |

### 4.6.1 Data Privacy and Consent (CG4.2.3.1)

A total of 43% of students indicated high concern about data privacy when using AI tools. This includes unease about entering personal data, uploading assignments into platforms, or sharing sensitive course material with generative systems.

“I avoid using my course materials in *ChatGPT*... I’m not sure where that data goes.” — Student 7

Despite this concern, interviews revealed limited understanding of data usage policies. This gap suggests that institutional support is urgently needed in AI privacy literacy, echoing the UNESCO

Framework's CG4.2.3.1 objective: "Students should respect data rights and know how AI platforms manage information" (UNESCO, 2024, 35.).

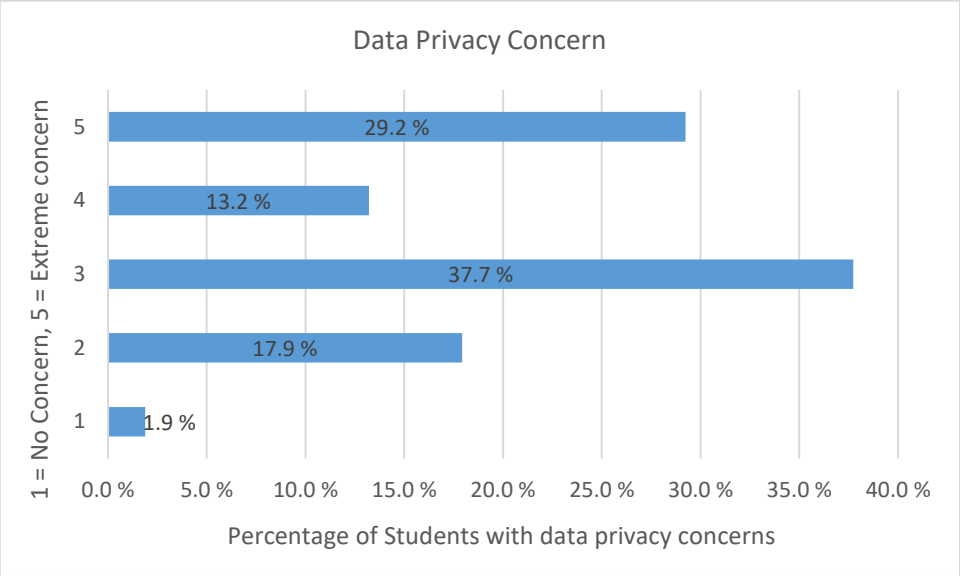


Figure 9 Percentage of Students with Data privacy Concerns

### 4.6.2 Responsible Use vs. Academic Misconduct (CG4.3.1.1)

Finally, the ethical tension surrounding fairness and misuse is perhaps most clearly seen in student reflections on academic integrity. As 41% of students rated concern about academic dishonesty at 4 or 5, and quotes reveal uncertainty around authorship and accountability.

"Everyone is using AI. If I don't, I'll fall behind." — Student 8
"I sometimes wonder if I've crossed the line without meaning to." — Student 4

This confirms that ethical boundaries are blurry, even as students seek to act responsibly. UNESCO CG4.3.1.1 urges institutions to guide "ethical and responsible usage that reinforces learning, not shortcuts it" (UNESCO, 2024, 31.).

The integration of the survey findings and interviews provided both valid and reliable results within the confines of this research. The survey touched on a demographically diverse group of students in higher education, and as such, it was relevant across all faculties. Consistency in answers, especially on vital issues like academic honesty and dependency on AI, cut across both quantitative measures and the narrative of interviews. Such thematic agreement adds credibility to the findings. Furthermore, the use of open questions allowed emergent themes (e.g., emotional dependency on AI, fear of deskilling) to arise spontaneously, which were then triangulated across different sources

of interview. Even though the research cannot claim generalisabilities for all institutions, its design and data sources produced a robust and trustworthy picture of the present student experience of AI.

# 5 Conclusion and Recommendations

## 5.1 Summary of Findings

Participants reported the application of AI tools in a variety of academic contexts, with the most common applications including writing support, linguistic refinement, ideas generation, and assignment planning. These applications align with global usage trends, where generative AI is being adopted as a cognitive offloading aid to help students manage workloads more efficiently (Beckingham et al., 2024,72.). The survey identified that over 60% of the respondents use AI tools at least on a weekly basis, particularly for grammar correction and content enlargement, indicating high infusion of AI in normal academic activities.

Among the tools provided, *ChatGPT* was the most utilized platform, with users praising its speed, user-friendliness, and overall usefulness. Students enjoyed its flexibility in tasks ranging from brainstorming to translating. *Grammarly*, *DeepL*, and AI tools in learning management systems were other preferred tools. These preferences are in line with Dyde's (2023.) findings, which highlight how LLMs are currently being utilized as on-tap allies in writing in higher education settings.

Ethical concerns regarding AI usage were prominent, particularly in areas of academic integrity (45.7%), over-reliance (46.2%), and bias or misinformation (43.4%). These concerns are consistent with current literature warning against undermining critical thinking ability and the risk of algorithmic bias in AI-generated content (Niloy et al., 2023, 4; Coetzee, 2025.). Interview stories supported these results, with some students voicing concern about "losing their own voice" or inadvertently plagiarizing because of over-reliance on AI-generated answers.

Although greater utilization of AI is prevalent, students' familiarity with campus policies that govern its use was inconsistent. Most of the respondents were either unaware of the guidelines available or unsure of what constitutes acceptable use. Such ambiguity has caused anxiety for students, especially when uncertain about whether their AI-produced work could be reported as misconduct. Beckingham et al. (2024.) argue that such gaps in communication demonstrate a broader institutional failure to provide clear, consistent policy guidance on infusing AI into educational institutions.

Finally, students enumerated several strengths and weaknesses of AI tools. Some of the most important strengths included increased productivity, quicker idea formulation, and enhanced linguistic expression. But these were balanced against serious reservations regarding the limitations of AI, such as its insensitivity to context, propensity to generate boilerplate content, and the ethical undecidability of its application. These observations are in alignment with the observations of Akinwalere and Ivanov (2022.), who warn that while AI may be an efficient scholarly scaffold, it can never substitute for the subtle, critical thinking encouraged by human teaching.

## 5.2 Conclusion

Artificial Intelligence is no longer a distant or emerging concept in higher education, it is a present and evolving reality, *DeepL* embedded in student workflows. This study demonstrates that students are not passive users; they are critically engaged, reflective, and often more ethically aware than institutional frameworks presume.

The use of tools such as *ChatGPT*, *Grammarly*, and *DeepL* is widespread, not as shortcuts but as extensions of cognitive effort. Students turn to these tools not only to save time but also to improve their learning process. However, without structured institutional guidance, the risk of misuse and dependency increases.

Educational institutions, therefore, have a critical role to play, not in banning or suppressing AI use, but in curating responsible AI ecosystems, where students are empowered, informed, and ethically supported. The future of AI in higher education must be collaborative, student-centred, and literacy driven.

## 5.3 Recommendations for Students

Based on these findings, students are encouraged to:

- Practice ethical awareness when using AI and always evaluate outputs and acknowledge AI support when relevant.
- Use AI tools for enhancement, not replacement, especially in the early stages of research, outlining, and language refinement.
- Review institutional guidelines, where available, and advocate for clarity where they are lacking.
- Engage in AI literacy development, including understanding bias, privacy risks, and limitations of generative models.

## 5.4 Recommendations for Educators and Institutions

To better serve and protect students in the evolving AI landscape, institutions and faculty should:

- Develop and communicate clear AI use policies, outlining what constitutes acceptable, collaborative, and prohibited usage in academic contexts.
- Integrate AI literacy training into coursework, including ethical considerations and citation practices.
- Adopt "human-in-the-loop" feedback systems, where instructors maintain control but are supported by AI-generated drafts of assessments or comments. As the AI educator interviewed noted:

“AI might suggest a grade based on my criteria, but I would still need to confirm it as that’s important.”

- Leverage AI for personalized academic planning, including adaptive learning paths and real-time feedback is consistent with Bloom’s (1984.) "Two Sigma" proposition, now potentially scalable through AI-powered tutoring.
- Support cross-institutional AI use, enabling students to co-design flexible study programs that incorporate modular content from multiple universities (Beckingham et al., 2024; QUADC, 2024.).

## 5.5 Institutional Vision: Instructor’s Strategic Perspective

The AI educator interviewed for this study provided insight into how AI could reshape higher education at a strategic level, beyond course-level applications. Four core domains were outlined:

1. Academic Planning: Using AI to design entire degree programs, map engagement data, and align curricula with labour market trends. This echoes strategic visions of AI-supported curriculum development in QUADC (2024, 14.).
2. Grading and Feedback: Implementing semi-automated grading systems that suggest grades and justifications, while keeping final decision authority with instructors supporting speed without sacrificing fairness.
3. Personalized Feedback: Offering tailored feedback at scale, especially in large classes, where AI can target misconceptions based on student responses. This operationalizes Bloom’s (1984) idea of personalized instruction.
4. Global Academic Pathways: Designing AI-driven academic journey advisors that can recommend courses from other institutions (e.g., MIT, ETH Zurich) for modular, internationalized learning.

These insights underscore the necessity of transitioning from reactive to proactive institutional strategies. Students are not waiting for permission to use AI, instead they're seeking partnerships that make it meaningful, safe, and empowering.

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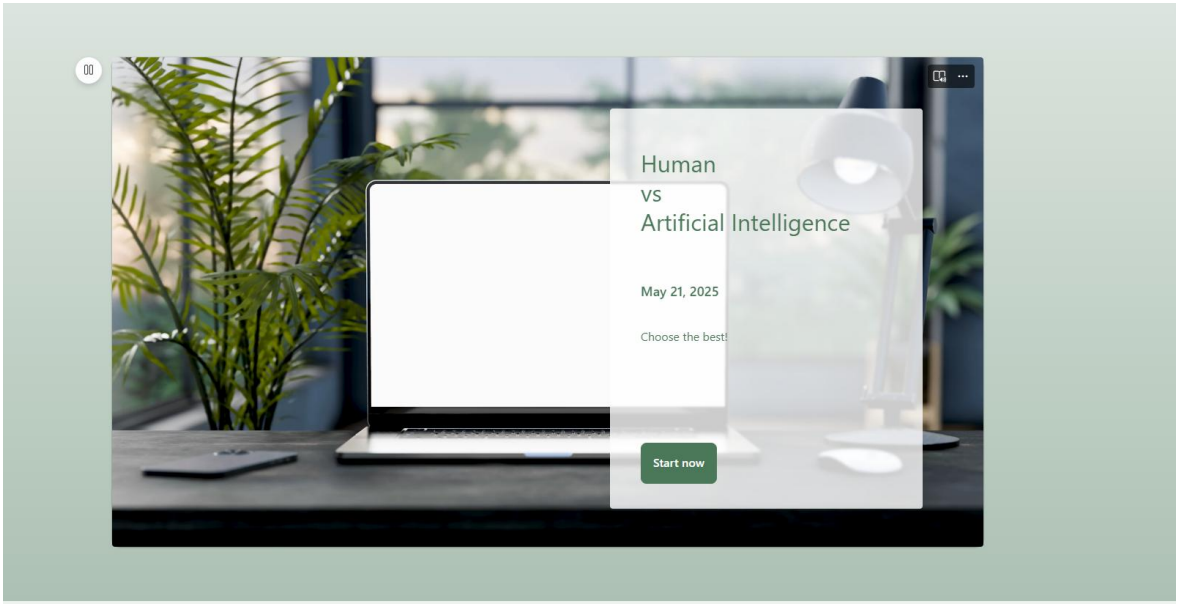
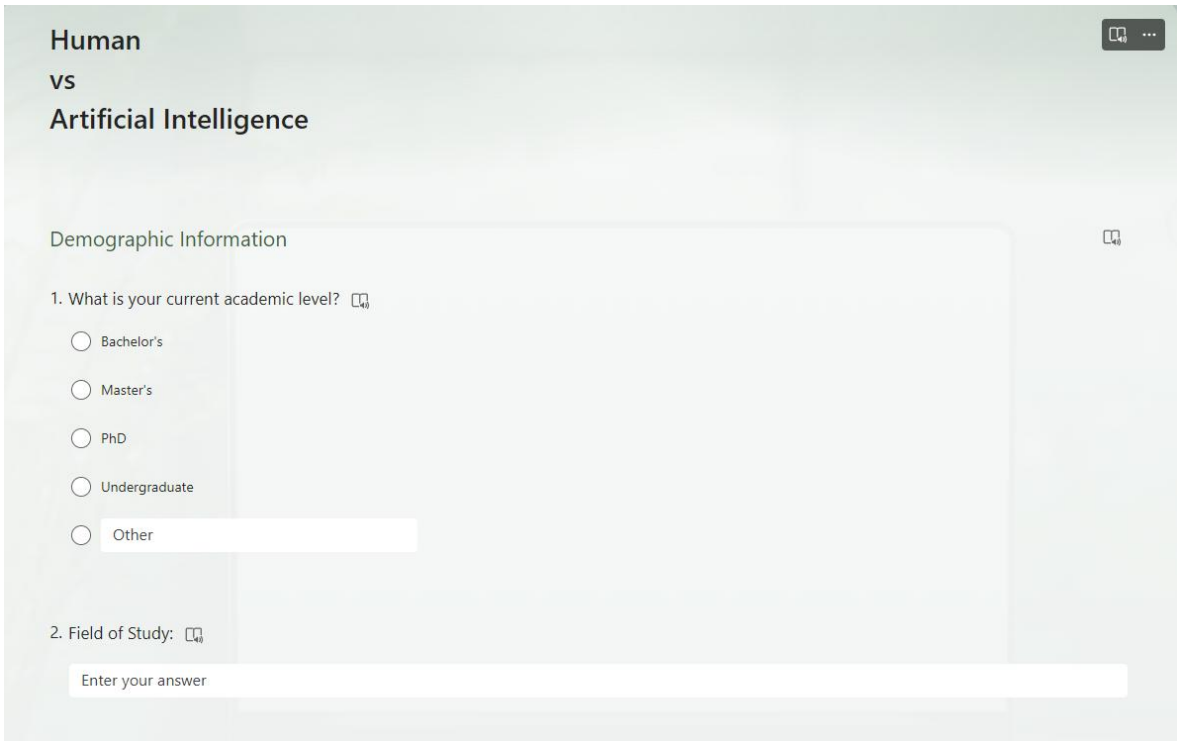
# 6 Appendices

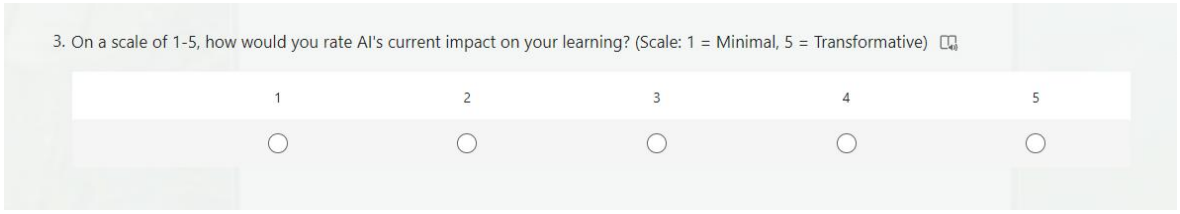
Appendix 1 Semi-Structured Interview Questions

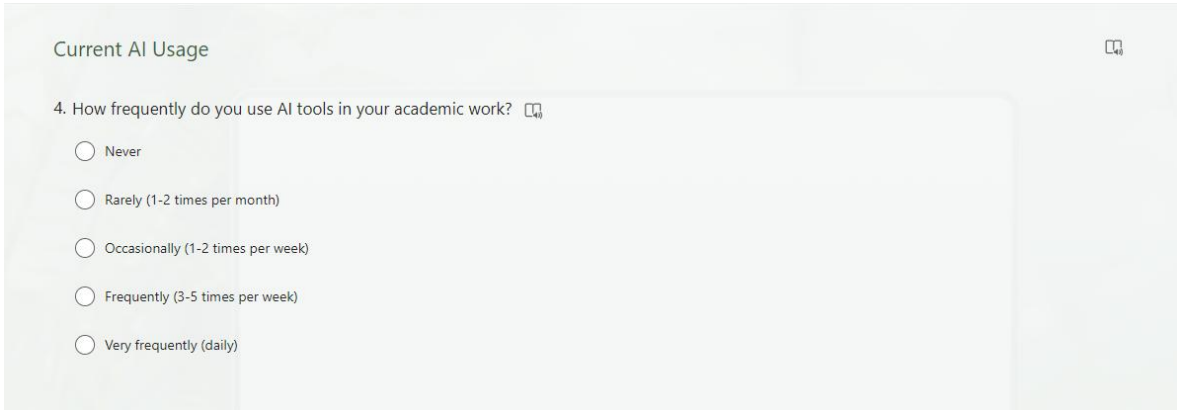
1. How do you currently use AI tools (e.g., ChatGPT, Grammarly, coding assistants, etc.) in your academic work or creative projects?
2. In what ways have AI tools helped or hindered your creativity, whether in writing, idea generation, design, or problem-solving?
3. Are there academic or personal tasks where you don't currently use AI, but believe it could be helpful if it were better designed or more accessible?
4. What ethical concerns, if any, do you have about using AI in your academic work (e.g., plagiarism, data privacy, over-reliance)?
5. How do you think universities should guide students in using AI tools ethically and effectively?
6. If your university were to integrate AI into the curriculum or offer structured AI tools, what features, or support would you find most useful?
7. Looking ahead, how would you personally like to use AI tools more effectively in your studies or professional development and what's missing today that would make that possible?

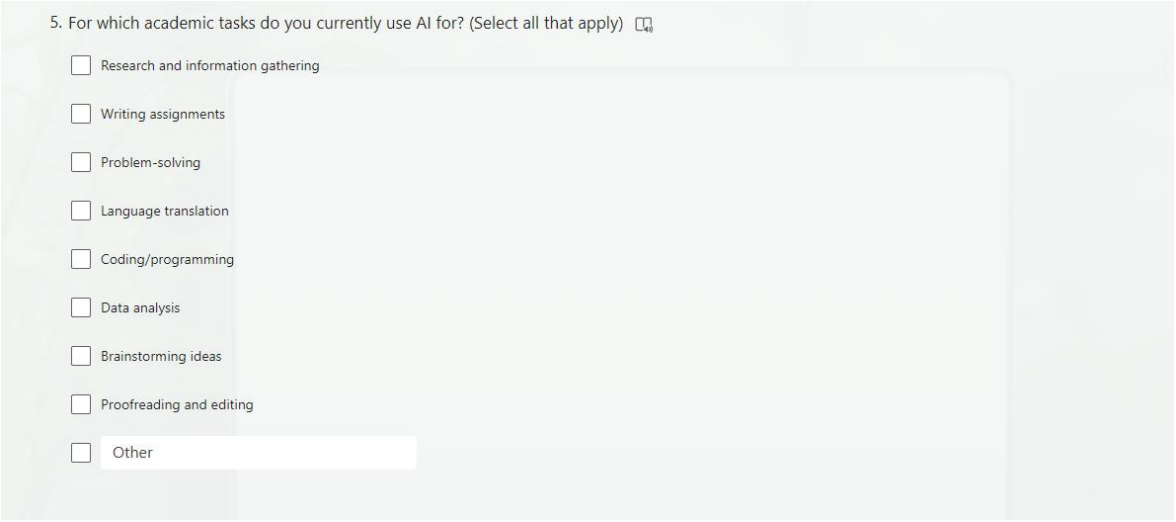
Appendix 2. Survey

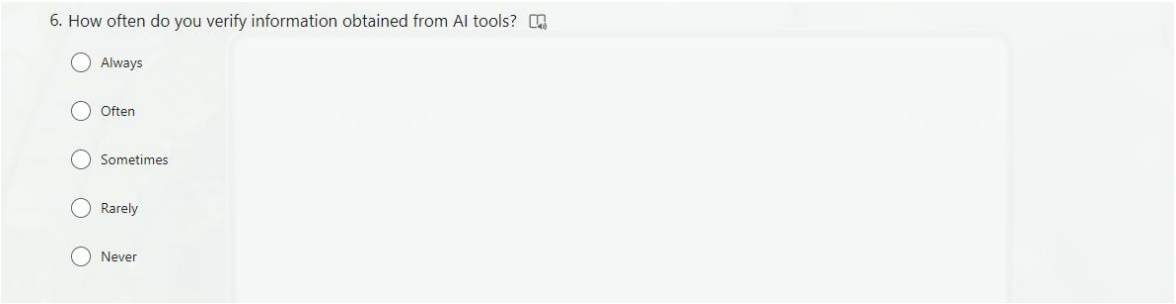


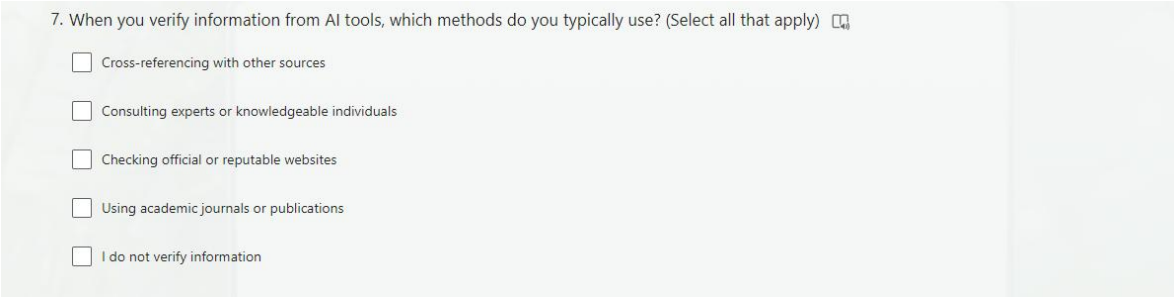

Human
vs
Artificial Intelligence
Demographic Information
1. What is your current academic level?
Bachelor's
Master's
PhD
Undergraduate
Other
2. Field of Study:
Enter your answer

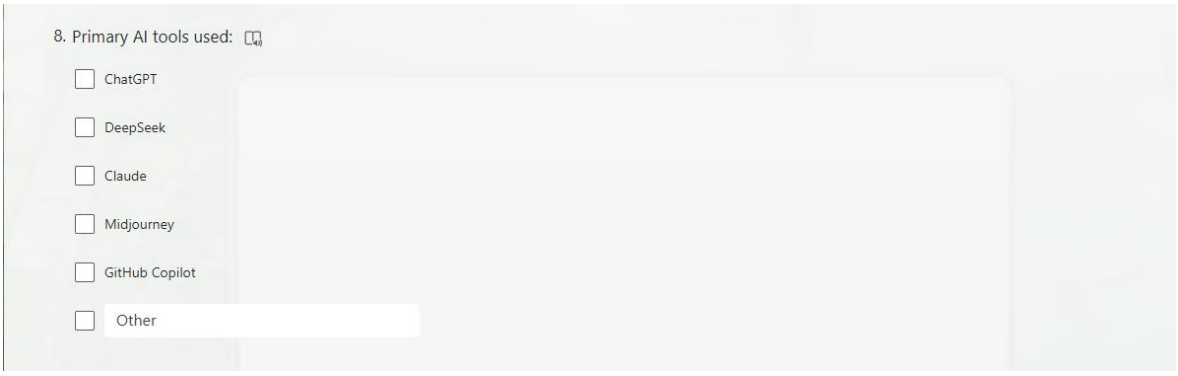

3. On a scale of 1-5, how would you rate AI's current impact on your learning? (Scale: 1 = Minimal, 5 = Transformative)
1
2
3
4
5


Current AI Usage
4. How frequently do you use AI tools in your academic work?
Never
Rarely (1-2 times per month)
Occasionally (1-2 times per week)
Frequently (3-5 times per week)
Very frequently (daily)


5. For which academic tasks do you currently use AI for? (Select all that apply)
Research and information gathering
Writing assignments
Problem-solving
Language translation
Coding/programming
Data analysis
Brainstorming ideas
Proofreading and editing
Other


6. How often do you verify information obtained from AI tools?
Always
Often
Sometimes
Rarely
Never


7. When you verify information from AI tools, which methods do you typically use? (Select all that apply)
Cross-referencing with other sources
Consulting experts or knowledgeable individuals
Checking official or reputable websites
Using academic journals or publications
I do not verify information


8. Primary AI tools used:
ChatGPT
DeepSeek
Claude
Midjourney
GitHub Copilot
Other

9. Rate the importance of the following motivations for using AI in your studies: (Scale: 1 = Not important, 5 = Extremely important)

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Saving time | ◯ | ◯ | ◯ | ◯ | ◯ |
| Improving assignment quality | ◯ | ◯ | ◯ | ◯ | ◯ |
| Learning new approaches | ◯ | ◯ | ◯ | ◯ | ◯ |
| Overcoming knowledge gaps | ◯ | ◯ | ◯ | ◯ | ◯ |
| Generating creative ideas | ◯ | ◯ | ◯ | ◯ | ◯ |

## Expectations and Preferences

10. What additional AI capabilities would you find most valuable in your academic work?

Please select 3 options.

- ☐ Personalized learning recommendations
- ☐ Real-time research assistance
- ☐ Advanced writing support
- ☐ Interactive tutoring
- ☐ Specialized subject-area expertise
- ☐ Adaptive study planning
- ☐ Other

11. How important do you believe it is to balance AI tool usage with human critical thinking and creativity in problem-solving?

- ◯ Very Important
- ◯ Important
- ◯ Neutral
- ◯ Unimportant
- ◯ Very unimportant

12. How concerned are you about the following AI-related issues? (Scale: 1 = Not concerned, 5 = Extremely concerned)

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Academic integrity | ◯ | ◯ | ◯ | ◯ | ◯ |
| Potential bias in AI responses | ◯ | ◯ | ◯ | ◯ | ◯ |
| Data privacy | ◯ | ◯ | ◯ | ◯ | ◯ |
| Over-reliance on AI tools | ◯ | ◯ | ◯ | ◯ | ◯ |
| Reduced critical thinking skills | ◯ | ◯ | ◯ | ◯ | ◯ |

13. In the future, how would you like universities to integrate AI into learning? (Select all that apply)

- [ ] Mandatory AI literacy courses
- [ ] AI-assisted teaching
- [ ] Guided AI tool usage
- [ ] Research methodology workshops
- [ ] Ethical AI use training
- [ ] Other

## Institutional Perspectives

14. Does your institution have clear guidelines about AI tool usage?

- ◯ Yes, comprehensive guidelines
- ◯ Minimal guidelines
- ◯ No guidelines
- ◯ Unsure

15. How do your instructors currently view AI usage?

- ◯ Fully supportive
- ◯ Cautiously accepting
- ◯ Neutral
- ◯ Skeptical
- ◯ Completely against

## Final Section

16. Additional Comments:

Enter your answer

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