ARTIFICIAL INTELLIGENCE POLICY IN HIGHER EDUCATION

Exploring the Student Stakeholder Perspective on Artificial Intelligence Tools and Policy at the University of Twente

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Abstract

Artificial Intelligence (AI) is a rapidly-evolving technology affecting education, in part due to the advantages and disadvantages for student learning. In this thesis, I conducted a case study of students at the University of Twente (UT) to study student perceptions on AI policy. To answer the exploratory research question –*"How do students at the University of Twente use and perceive Artificial Intelligence tools and UT AI policy, and what are their views on future UT AI policy?"*– a textual analysis of eight interviews with study association board members, speaking as experts on behalf of their associations' members, was performed. This thesis aims to generate new knowledge on student perspectives on AI. This research shows that most students frequently use AI tools and generally perceive AI as beneficial for efficiency and learning, but express concerns about over-reliance and diminishing skills. Most students are unfamiliar with existing UT AI policy and consider it ineffective. Students call for decentralised policies, and identify AI education and alternative testing methods as worthwhile initiatives. This thesis provides relevant insights into student perspectives on AI, and can be helpful to the UT and other academic institutions by showing areas of concern and potentially effective implementation strategies.

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1. Introduction

Artificial intelligence (AI) refers to technology capable of mimicking human learning and thinking processes (European Parliament, 2020). While AI holds significant potential for innovation, it also presents serious challenges, such as limited explainability, data security, data privacy, and ethical problems (Wang & Siau, 2018). These challenges vary per sector, and one area where the rapid rise of AI has proven challenging is academic institutions (Moya et al., 2024).

As academic institutions, universities have a societal duty to safeguard academic performance, and ensure that students graduating possess an adequate skill set to enter the workfield after their studies. AI tools pose a threat to academic institutions, as the tools can be misused by students. Deliberate misuse of AI, such as untraceable cheating, and unintentional misuse, such as the propagation of biases within AI tools, both present serious risks (Moya et al., 2024).

At the same time, AI tools offer promising educational benefits, such as Intelligent Tutoring Systems (ITS) to provide students with adaptive learning opportunities, helping students manage their study time more effectively, and potentially improving student performance (Khare et al., 2018). As the impact and regulation of AI tools is not straightforward, regulating its use poses a major challenge for academic institutions in navigating their policy-making process.

Within this process, it is crucial to consider not only the institutional perspectives on AI, but to also include other relevant stakeholders, such as students. Studies have previously

explored the perspectives of students on the use of AI for academic purposes. A 2024 study on student perspectives on the use of AI concludes that attempts to ban the use of AI would be both unrealistic and not to the benefit of students (Johnston et al., 2024). Another study, focused on the perspective of Indonesian students on AI, concluded that AI enhanced writing abilities, self-efficacy, and understanding academic integrity, but that concerns were raised regarding the potential impacts on creativity, critical thinking, and ethical writing practices (Malik et al., 2023). A third study also identifies social risks, such as the potential adverse impacts of AI for conventional teaching jobs and diminishing human relations in educational environments (Al-Tkhayneh et al., 2023).

This thesis focuses on students as key stakeholders in order to explore their perspectives on AI and AI policies, specifically at the University of Twente (UT). Although previous research (Johnston et al., 2024; Malik et al., 2023; Baidoo-Anu et al., 2024; Al-Tkhayneh et al., 2023) has been done to identify the student perspectives on AI, these were conducted in different cultural and educational contexts, namely the United Kingdom, Ghana, Indonesia, and the United Arab Emirates. This study contributes to the literature by examining student perspectives at a Dutch university. As previous research has primarily used quantitative methods, this research will provide new insights and knowledge through qualitative methods.

The central research question that this thesis seeks to answer is:

"How do students at the University of Twente use and perceive Artificial Intelligence tools and University of Twente Artificial Intelligence policies, and what are their views on future University of Twente Artificial Intelligence policy?"

To answer the main research question, I formulated three sub-questions:

SQ1: *How and where are different types of Artificial Intelligence (tools) used by students?*

SQ2: How do students perceive the advantages and disadvantages of Artificial Intelligence (tools)?

SQ3: How do students perceive the current Artificial Intelligence policy of the University of Twente, and what ideas do they have to build further Artificial Intelligence policy?

By answering these questions, this research adds to previous studies by creating a deeper understanding of student perspectives on AI. As the interview subjects have an expert role, qualitative methods can be used, while still accounting for a considerable amount of the student population from two clusters (natural sciences and social sciences) at the UT. By building on existing knowledge and new findings, the research aims to gain unique knowledge on the perspective of students on AI in the Netherlands, and provide clear policy recommendations for the UT.

1.1. Social and Scientific Relevance

Artificial Intelligence is rapidly evolving and affecting nearly every industry in society, including education. Academic institutions face the complex challenge of regulatingAI use. Making AI policies is particularly a challenge as it poses significant risks to academic integrity (Malik et al., 2023), but also provides great learning opportunities for students (Malik et al., 2023; Al-Tkhayneh et al., 2023). As a full ban on the use of AI would be both unrealistic and not to the benefit of students (Johnston et al., 2024), it is essential for academic institutions to implement well-crafted policies to minimise the risks while maximizing the benefits.

The difficulty of developing policies surrounding highly dynamic emergent technological processes can be explained by two key theoretical frameworks. The Collingridge dilemma states that technologies must be sufficiently developed to predict its impacts, yet become difficult to control when the technology is widely adopted (Collingridge, 1982). Another theory explaining the difficulty of AI policy-making is the pacing problem. The pacing problem suggests that technological innovation increasingly develops at a faster rate than policies (Downes, 2010). These theories highlight the complexity of creating AI policies. To bridge the gap between technological impact and effective policy, stakeholder perspectives on the issue are highly relevant. This research contributes to that process by offering deeper insights into the views of students to guide policy-making in the near future.

As a stakeholder group, students are often overlooked. Not much research has been done on student perspectives, and the research that has been conducted was done in dissimilar nations. By addressing this gap, and utilising a qualitative approach with interviews instead of a quantitative approach with surveys as the main method of data collection seen in previous studies (Johnston et al., 2024; Malik et al., 2023; Baidoo-Anu et al., 2024; Al-Tkhayneh et al., 2023), this research contributes a deeper understanding of student perspectives on AI in academic institutions regarding their perception of AI tools and policies, as well as ideas for further policy. This research can potentially help the University of Twente and other academic institutions in navigating AI policy by providing insights of students' perspectives.

1.2. Structure of the Thesis

This subsection outlines the structure of the thesis. Chapter *2. Theory* discusses relevant

concepts related to the research question based on existing literature and formulates expectations for this research based on this literature. Chapter *3. Methodology* describes the research design, data collection methods, and method of data analysis. Chapter *4. Policy Context* provides an overview of relevant policy developments and policies surrounding AI at the University of Twente. Chapter *5. Results* presents the findings and provides an answer to the three formulated sub-questions by looking at AI usage among UT students, student viewpoints on AI, and student viewpoints and ideas on UT AI policy. Chapter *6. Discussion* reflects on the results in relation to chapter 2, as well as other relevant implications. Chapter *7. Conclusion* answers the main research question, discusses the scientific relevance of this thesis, and offers suggestions for policy-making and further research.

2. Theory

This chapter focuses on identifying and explaining critical concepts surrounding the research question, and provides expectations for the results of the primary data collection. Theoretical concepts that are explained in this chapter are Artificial Intelligence, Artificial Intelligence tools, and student perspectives on Artificial Intelligence.

2.1. Artificial Intelligence

To understand the risks and benefits of Artificial Intelligence (AI), it is necessary to know what AI is, and what AI is capable of doing. In 1950, researcher Alan Turing asked the question "*Can machines think?*", and with his article *Computing Machinery and Intelligence* (1950), introduced the concept of Artificial Intelligence. Artificial Intelligence is a difficult term to define, but stems from creating a certain property, in this case intelligence, in something through a non-natural process (Fetzer, 1990).

A more recent explanation of AI systems is technologies that can take over tasks that require human intelligence, and do so by imitating human intelligence and behaviour (Karthikeyan et al., 2021). In order to do so, most modern AI tools use machine learning, where the tool continuously improves its behaviour based on studying their past experiences and future predictions (Russell & Norvig, 2022). Two common examples of machine learning relevant to this research are deep learning and Natural Language Processing (NLP). Deep learning involves training a system of algebraic circuits to let a large number of input variables interact with each other, and thereby being able to represent the complexity of real-world data for various significant types of learning problems (Russell & Norvig, 2022).

Natural Language Processing means that the tools are built to communicate using human language, in order to learn from the vast amount of information available in natural language online, communicate with humans, and advance scientific understanding of language (Russell & Norvig, 2022).

Due to AI agents' ability to learn from immense amounts of data, it can improve efficiency and performance when replacing or helping humans (Karthikeyan et al., 2021). Additionally, the ability of AI to accelerate scientific research could lead to remedies for illnesses and solutions to other pressing matters in the future (Russell & Norvig, 2022). On the other hand, risks of AI include privacy breaches, biased decision making, and a shrinking of the job market due to AI replacing humans (Russell & Norvig, 2022).

2.2. Artificial Intelligence Tools in Higher Education

Both academic institutions and students have the opportunity to implement AI applications. Academic institutions may adopt AI for administration or instruction in education, while students can use AI for a wide range of academic activities. This paragraph focuses on students' use of AI, specifically the types of tools employed and the contexts in which they are applied.

The most prominent type of AI in education is Generative Artificial Intelligence (GAI), a type of AI that makes use of deep learning to generate content based on existing knowledge (Banh & Strobel, 2023). Notable examples of GAI tools are ChatGPT, Gemini and CoPilot. Another type of AI tool used in education is as an Intelligent Tutoring System (ITS), which are applications that act as tutors to provide students with personalised instruction (Graesser et al.,

2011). Although practices like personalised instruction and practicing often are some of the best practices to improve academic skills of students, these are time-consuming measures (Allen et al., 2016). With the use of AI tools, these practices can be done considerably more efficiently.

AI tools can also assist students with their academic writing skills. They can provide students with assistance in grammar, structure and punctuation, and can summarise large texts like research papers and scientific articles (Churi et al.,2023). Additionally, they can assist students in giving their writing the right format (Churi et al.,2023). AI is most commonly used for asking questions to improve students' understanding of certain subjects (Von Garrel & Mayer, 2023). However, the study also identifies several other relevant use cases, such as academic research, translations, text analysis, processing & creation as well as for problem-solving & decision-making (Von Garrel & Mayer, 2023).

Despite these benefits, the use of AI tools within academic contexts presents significant risks. Privacy and data protection are at risk, and teachers may also face challenges in adapting to and effectively integrating these technologies (Özer, 2024). OpenAI, the developer of ChatGPT, acknowledges several limitations of the tool on its website (2022), which include that "*ChatGPT sometimes writes plausible-sounding but incorrect or nonsensical answers",* "*ChatGPT is sensitive to tweaks to the input phrasing*", and admits to biases in the training data, stressing the importance of using AI responsibly.

Several scholars have discussed policy-making around fast-developing technologies, as discussed in *1.2 Social and Scientific Relevance*. One well-known framework is the Collingridge dilemma, which outlines an obstacle in regulating emerging technologies. When a technology is novel it is difficult to to predict its impacts and design policy, yet when the technology is

well-adopted it becomes hard to control and regulate (Collingridge, 1982). Another related concept is the pacing problem by Larry Downes (2010), wherein he argues that technological innovation increasingly outpaces policy development. These theories can be seen in practice in academic institutions. A 2023 study analyzed the top 500 universities worldwide and found that less than one-third of these universities had implemented a ChatGPT policy by mid-2023 (Xiao et al., 2023). Another study by Brandon et al. (2025) reports that under forty percent of surveyed academic institutions had AI policies in place, even though discussions at some universities started as early as 2022.

2.3. Student Perspectives on Artificial Intelligence

For students, AI tools can help them in their studies in various ways. A UK-based study with over 2500 participants found that over half of the participants had used or considered using AI to help them with academic tasks (Johnston et al., 2024). Many students found that AI tools such as translation machines, grammar and language checkers, and plagiarism detection tools enhanced their writing skills and self-efficacy (Malik et al., 2023). However, students have also pointed out concerns regarding the use of AI technologies. Students noted that no training or education was given around the use of AI, and that use of AI can lead to overreliance on technology, plagiarism and security risks (Baidoo-Anu et al., 2024).

Students were unsupportive of using generative AI tools to formulate entire assignments, but do not believe a full ban on AI tools should be imposed (Johnston et al., 2024). Due to many higher education institutions not having clear policy guidelines, students may not disclose their AI use because of worries regarding academic integrity (Baidoo-Anu et al., 2024). Most students believed university-wide policies and regulations on the usage of AI would be

appropriate (Johnston et al., 2024).

2.4. Research Expectations

Based on previous research surrounding AI use among students, this research formulated some expectations. However, it is important to be cautious with predictions, especially when concerning less recent studies, because of the rapidly-evolving state of AI technologies.

Expectation 1: Students will possess at least some level of familiarity with different Artificial Intelligence tools and have used these on a regular basis.

Given the widespread presence of AI tools in current society, most students included in the scope of this research have likely encountered and used AI tools for academic purposes. They are expected to be open to the use of AI in education. Due to the nature of popular use cases, it is plausible that most students use AI tools regularly.

Expectation 2: Students will perceive efficiency as an advantage, but may overlook the negative consequences on student performance.

Existing literature suggests that students often view efficiency as a major benefit of AI use. However, students may mistake efficiency for convenience, potentially leading to overreliance on AI tools. This, in turn, could hinder the development of academic skills.

Expectation 3: Students will show some awareness of the risks associated with AI, and are likely to not have had education on the topic.

It could be argued that many students are likely unaware of AI risks, based on the notion

that no training or education was given around the risks of AI, even though the use of AI provides several risks. However, looking at the studies, it is visible that students were quite aware of risks, such as overreliance on technology, plagiarism and security risks, so therefore it is hard to determine if this will be the case for the research subjects.

Expectation 4: Students will generally consider clear AI policy reasonably important but will not want a full ban on AI tools.

Lastly, it is expected that most students find a clear AI policy to be at least somewhat important, but do not want a full ban to be imposed due to the positive effects it can have on academic performance.

3. Methodology

This chapter presents an overview of the methodology used to answer the research questions of this study. The chapter is divided into six sections. Section 3.1 discusses the research design, section 3.2 describes the data collection methods, and section 3.3 clarifies the data analysis methods, as well as providing a discussion on the operationalization of key concepts. Section 3.4 discusses methodological considerations, including reliability and validity, and section 3.5 provides a conclusion to the chapter by summing up the main research activities.

3.1. Research Design

The primary objective of this research is to develop a clear understanding of student perspectives on AI and AI policy. The research design chosen for this bachelor thesis project is an exploratory case study design. From Yin's (2012) typology of case studies (figure 1), this research classifies as a single-case design with embedded units of analysis.

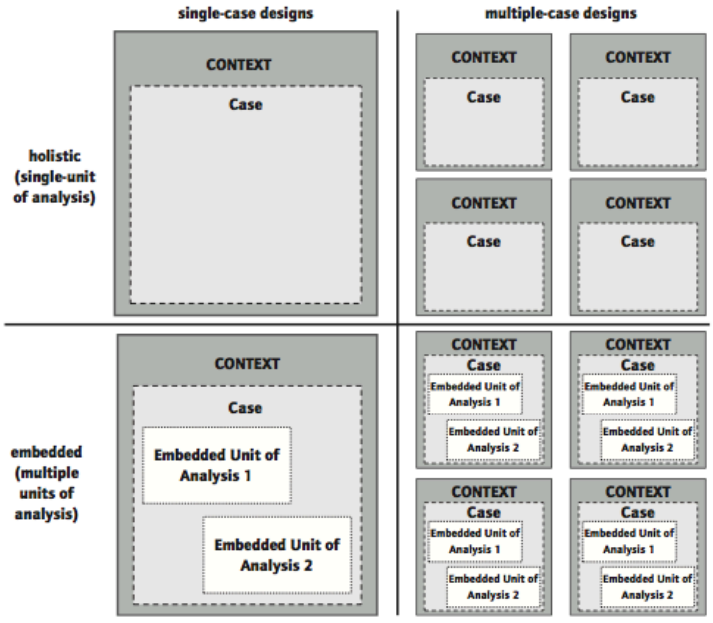

Figure 1: Yin's (2012) typology on Basic Types of Designs for Case Studies

The context of this research is universities in the Netherlands, with the University of Twente as the case. The embedded units of analysis are study associations. Having eight units of analysis adds to the strength of the case study. As rationale for using a single-case study, the case of the UT classifies as a representative case (Yin, 2012), as the UT is a public university with a wide range of study programmes, ranging from social and natural sciences to engineering.

This bachelor thesis project employs qualitative research based on interviews. This particular design is used because of the exploratory nature of the research question, where a detailed understanding of the issue is sought, which is not obtainable through literature or quantitative data analysis (Creswell, 2007). The design allows for in-depth research into UT students' views on AI policy.

The research design involves purposeful sampling to select individuals with specific knowledge about student issues, and, given the time constraint of a bachelor thesis, provided the most effective use (Palinkas et al., 2013). Each of the interview subjects selected is a board member of a study association at the time of writing, specifically holding the function commissioner of educational affairs, a position responsible for gathering student feedback on the study programmes and maintaining contact with programme staff. Their role enables them to make expert judgement on student perspectives within their associations. Due to the interview subjects reasoning from their members' viewpoints instead of their own, it is possible to use qualitative data analysis to form a deeper understanding of the student perspective on AI whilst indirectly incorporating many students' opinions.

It is important to distinguish between student associations and study associations, as the

two concepts are often mistaken with each other. Study associations are related to one or more specific study programmes, and they organise educational activities, such as symposia, career orientation opportunities, discounts on study materials, as well as social activities (University of Twente, n.d.-c). Student associations are not tied to a particular study programme, and can range from social and cultural to sports associations. (University of Twente, n.d.-c). The sample consisted of board members of study associations because of their commitment to bettering education, and their knowledge and insights of student opinions within their association. Due to the easy accessibility of the interview subjects, the sampling can also be classified as convenience sampling (Etikan, 2016).

Although I developed this bachelor thesis for three modules (approximately thirty weeks), the scope of the research needs to fit a regular thesis of approximately ten weeks. Therefore, the research focuses on associations from two different clusters. These clusters are natural sciences and social sciences, with four study associations for both clusters, and one respondent for each association. Hereafter, associations from the natural sciences cluster are referred to as Associations 1, 2, 3 & 4 with their respective respondent as Respondent A, B, C & D. Associations from the social sciences cluster are referred to as Associations 5, 6, 7 & 8 with their respective respondent as Respondent E, F, G & H. Having two clusters as opposed to one improves the generalizability of the results.

3.2. Method of Data Collection

The data collection relies on primary data to develop insights and reflect upon existing literature. I conducted eight interviews with study association board members at the UT. The

respondents spoke as experts on student perspectives within their associations. Expert interviews offer more efficient and concentrated research (Bogner et al., 2009), and therefore a more extensive exploration of student perspectives within the scope of a bachelor thesis. I selected board members because they represent the views of students in their association and actively seek to improve the educational experience. By employing expert interviews, the respondents act as representatives of all students within their association (Bogner et al., 2009). As a board member, it is their responsibility to ensure that their members' best interests are kept at heart, and that their members' opinions are heard and redirected to the programme staff. Due to their commitment to improving education for these students, it is expected that they have better insights into the overall perspectives on AI within their association than most students. I specifically selected commissioners of educational affairs, due to their core duties involving gathering information about study programmes and study-related issues from students, and redirecting this to the study programme staff.

To develop the interview questions, I developed a conceptualization of the key concepts based on the literature to determine relevant variables and establish expectations. Additionally, I conducted a mock interview with a commissioner of educational affairs who did not participate in the actual research, therefore providing a realistic and representative opportunity for improving the interview questions, as well as making me familiar with the interviewing process.

In total, I conducted eight interviews, one with each respondent. All interviews took place between the 11th of April and the 13th of May of 2025. Each interview lasted between twenty and thirty minutes.The interviews were semi-structured, and interviews consisted of some predetermined questions regarding students' familiarity with and usage of AI, perceived advantages, disadvantages, good practices and bad practices, as well as students' perception of

UT AI policies and how to further develop these policies. The format allowed for elaborations of answers (Lewis-Beck et al., 2004), while still to a large extent allowing for comparison due to the consistent order of open-ended questions.

All respondents agreed to the interview being recorded, allowing for accurate transcripts to be produced. After the transcripts were finalised, the recordings were destroyed in accordance with the application for ethical review at the BMS faculty. I translated all quotations in chapter *5. Results* to preserve the meaning and guarantee the anonymity of the interview subjects. Transcripts are not added to this document, but can be requested using the information found in the document with application number 241242 at the Ethics Committee BMS.

3.3. Method of Data Analysis

This study uses document analysis as its method of textual analysis, focusing exclusively on primary data from the interviews to gain insights for the main research question (Bowen, 2009) and reflecting on existing literature and expectations posed in chapter *2.4. Research expectations*. Qualitative content analysis provides the possibility to identify patterns and themes from the interview data (Babbie, 2013). In the context of this research, these patterns and themes can help in creating a more structured overview of student perspectives on AI, a significant and societally relevant topic with many nuances and different ideas.

After completing all interviews, I developed a coding scheme based on the existing theory and an initial reading of each interview keeping the sub-questions and main research question in mind. Based on the interview answers, I applied axial coding to identify core concepts relevant to the sub-questions and main research question (Babbie, 2013). After coding all texts, coded answers were re-evaluated to combine similar codes and develop themes within

important concepts.

I used manual coding to analyze the data, as the number of interviews did not require any coding software. I used online spreadsheets during the coding process to register terms, themes, applied codes and quotations to support the applied code. The quotations served as a means of illustrating findings in chapter *5. Results*, as well as adding nuance and depth to categorised codes. To analyse the interview transcripts effectively, I operationalised several abstract concepts to ensure a consistent and clear interpretation of the responses.

For SQ1 – *How and where are different types of Artificial Intelligence (tools) used by students?* – patterns of AI use and applications of AI by students are the key concepts. Patterns of AI use includes the terms familiarity with AI and frequency of use, which were both measured using a 5-point Likert scale, allowing for a more nuanced and consistent interpretation (Likert, 1932). Applications of AI by students include the terms different types of AI tools and categories of use, which are both more concrete. Based on theory and retrospectively on interview data, I identified slightly broader codes to categorise interview answers.

SQ2 reads: *How do students perceive the advantages and disadvantages of Artificial Intelligence (tools)?* As an extension of the key concepts of advantages and disadvantages of AI, the sub-question also aims to study good and bad practices for AI use. Due to the amount of different advantages and disadvantages, I identified themes to categorise the codes. For example, codes for the term *perceived advantages* are classified as *Educational*, *Efficiency & workflow*, or *Research.* As a result of this, similar (dis-)advantages can highlight correlations between the interviews.

SQ3 poses the question: *How do students perceive the current Artificial Intelligence policy of the University of Twente, and what ideas do they have to build further Artificial*

Intelligence policy? The first part of the question is concerned with perception of current AI policies at the UT, mostly focusing on abstract terms such as level of familiarity with UT AI policy, perceived effectiveness of UT AI policy and perceived importance of clear AI policies. Again, the Likert scale (1932) is used here for the reasons mentioned earlier. The second part of the question relates to ideas to develop AI policy. I identified themes to categorise similar ideas and codes established based on concrete ideas mentioned by respondents.

With the completed coding scheme and all interviews coded accordingly, the coding scheme provided a structure to write chapter *5. Results* and produce answers to the sub-questions. The complete coding scheme is included in *Appendix A: Coding Scheme*, and provides a complete overview of the established terms, themes, and codes following the operationalization described in this paragraph.

3.4. Considerations of this Research

With the approach described in this chapter there are several limitations. First, the coding process relies on subjective interpretation, and therefore poses a risk of researcher bias (Babbie, 2012). To counteract this, I operationalised key concepts to formulate objective codes. As a researcher and a student, there is also a potential risk of researcher bias, as I am part of the stakeholder group being researched. Efforts to limit any potential bias include conducting a mock interview to identify biases, and interviewing eight different commissioners of educational affairs from eight different study associations as a way of triangulation. This is further strengthened by interviewing respondents from two different clusters. During the interviews I paid close attention to remaining clear, gentle, open, and (self-)critical.

Respondent bias also poses a potential limitation. Although I asked participants to speak on behalf of their association's members, they may have occasionally voiced their own opinions

instead. To limit this potential bias, I reminded the students multiple times, before the start of the interview and during the interview, that their members' opinions were relevant.

Regarding reliability and validity of this research, I identified several measures to make the research as reliable and valid as possible. I employed internal triangulation as a means to identify differences in data between the two identified clusters and between each respondent separately, as well as assessing inter-expert agreement and representativeness of different perspectives and opinions (Von Soest, 2022).

Further research can enhance both validity and reliability by expanding the number of interviews, especially when including stakeholders from different hierarchy levels, and including both inside actors and outside experts (analysts) in the analytical framework (Von Soest, 2022).

3.5. Conclusion of Methodology

This research employed an exploratory single-case study design to investigate student perspectives on AI policy at the UT. I used purposeful sampling to select eight commissioners of educational affairs from various study associations, interviewing them as expert representatives of student views within their association.

I collected data through semi-structured interviews, based on key concepts from the literature and research expectations. I analysed the interview transcripts through qualitative content analysis and manual coding, using axial coding to identify patterns and themes linked to the research questions. Internal triangulation between associations and clusters further strengthened the validity of the results.

The coding scheme provided a structured framework for analyzing the interview data. By categorizing responses into clearly defined codes and themes aligned with each sub-question, the analysis revealed patterns in AI usage (SQ1), student perceptions of advantages and disadvantages of AI (SQ2), and viewpoints on current and future AI policy (SQ3). This approach allowed for the identification of common and nuanced perspectives, enabling a comprehensive answer to the main research question.

4. Policy Context

Since the interviews described in chapter *3. Methodology* included questions about the Artificial Intelligence policy at the University of Twente, it is important to establish the policy context in which the interviews took place. The context matters particularly surrounding rapidly-emerging technologies such as AI, where policies and developments are regularly revised and updated. As previously mentioned, the interviews with students occured between the 11th of April and the 13th of May 2025. Subsequently, this research considers all publicly available policy documents until the 20th of May.

On the UT's website, there are many web pages on the topic of AI, including informative pages about *AI and assessment* and *Beneficial use of AI for teaching, learning and assessment* to *Guidelines for using AI during your studies at UT* and a policy document on *Use of AI in Education at the University of Twente*. The UT considers both the positives and negatives of AI in its policy-making process. The Executive Board's vision encapsulates this view: "*We must embrace AI technology carefully and strengthen the human factor in education to adapt and deal with the technology responsibly and ethically.*" (University of Twente, n.d.-a).

Despite the availability of multiple documents, the absence of a central repository makes it difficult to navigate between them. Given the rapid rhythm of changes in policy developments, it is at times difficult to determine which is the leading document.

The document *Use of AI in Education at the University of Twente* (University of Twente, n.d.-d), outlines rules surrounding the use of AI. In summary, these rules are:

For teachers:

- Teachers, at module level, decide (how much) AI students are allowed to use. Categories of restrictions are No (no use of AI permitted), Some (AI for certain purposes or certain

AI tools) and Yes (any use of AI permitted).

- If teachers suspect a student of using unpermitted or unreported AI, they should report the student to the Examination-Board.

For students:

- If AI tools are allowed, the use of these tools should be disclosed in the appendix, or a statement that no AI tools were used.
- All software should be disclosed because it has the potential to include AI.
- Students not adhering to above mentioned rules or not following the restrictions set by the teachers are considered to have committed academic misconduct.

The number of fraud cases at the UT has increased significantly in recent years, as can be read in the Annual Report 2023-2024 of the Examination Boards BMS (2025), a document outlining a review of academic misconduct, student appeals, and other topics related to examination within the faculty of Behavioural and Management Sciences at the UT. The report concluded that the number of notifications of academic misconduct had significantly grown in comparison to the previous year, but that suspicions of AI are difficult to prove without hard evidence. The examination board have made it a focal point to continuously educate themselves on AI developments, gain more insight in preventing students from using AI unethically or irresponsibly, and develop clearer rules for AI use of students and reporting of AI by teachers together with CELT, *the Centre of Expertise in Learning and Teaching* (Examination Board BMS, 2025).

Within the UT, several initiatives aim to develop AI-related education. The CELT task group explores the possibilities of the beneficial use of AI for teaching and assessment purposes

(University of Twente, n.d.-b). Additionally, study associations from the faculty of *Behavioural, Management & Social Sciences* have conducted an input session with students in January 2025 to gather their input on the several aspects concerning AI.

5. Results

This chapter presents an overview of the interview results. The chapter is divided into four sections. Each of the first three sections is related to a sub-question, and presents findings of relevant themes for these sub-questions as formulated in chapter *1. Introduction* with the use of the developed coding scheme (appendix A). These sections conclude with the answer to the relevant sub-question. Section 5.4 compares findings between the two clusters. Please note that the term students throughout this chapter refers to members of the study associations (1-8) of the respondents (A-H), and not the University of Twente student population as a whole.

5.1. Artificial Intelligence Use among University of Twente Students

This section focuses on Artificial Intelligence usage among students, including familiarity with AI, types of AI, usage patterns, and demographic differences, and concludes with an answer to SQ1: *How and where are different types of Artificial Intelligence (tools) used by students?*

5.1.1. Familiarity with Artificial Intelligence

Seven out of eight respondents (A; B; C; D; E; G; H) estimated that students within their associations are familiar with AI, while the remaining respondent (F) believed that students are at least somewhat familiar. All respondents (A; B; C; D; E; F; G; H) indicated that AI tools are used frequently for academic purposes, underscoring their relevance and widespread integration in the academic landscape. Three respondents (A; F; H) explicitly remarked that many students use AI tools every day, while others (E; G) estimated that students use it for every assignment.

5.1.2. Types of Artificial Intelligence Used by Students

Various AI tools were mentioned, with generative AI, in particular ChatGPT, being the most prevalent. ChatGPT was explicitly referenced in all interviews and, according to several respondents (A; B; C; E; H), is sometimes the only tool students regularly use. AI writing assistants, such as Grammarly, which support grammar and language correction, were the second most cited category (A; B; E; F). Other tools mentioned include AI study platforms (F; G), such as LessonHub, and academic research assistants (F), such as SciSpace. Although students from the social sciences cluster referred to more distinct types of AI tools, generative AI remains the most commonly used type across both clusters.

5.1.3. Patterns of Artificial Intelligence Usage

Students most commonly engage with AI tools for text generation (A; B; C; D; E; F; G). Several respondents (A; B; D; F; H) noted that some students generate substantial portions of their assignments using AI, although this was not considered representative of students as a whole. More typically, students use AI as support similar to a teaching assistant (B; C; D; E; F; G). Similar uses included seeking help when encountering difficulties (B; F), exploring ideas with AI as a sparring partner (D), and peer-reviewing texts (E).

Another frequent application is using AI for inspiration, particularly in the early stages of assignments (D; F; G; H). This appears more common in the social sciences, where written assignments are more prevalent, whereas students in natural sciences typically encounter more calculations or programming. AI tools are also employed for clarifying academic or non-academic concepts and content (A; B; H), grammar and language checking (A; B; E; F), and

academic literature search (C; D; F), where it serves to filter and locate relevant sources efficiently. Less frequently mentioned were the use of AI for image generation (A; B) and plagiarism detection (E).

One notable area where students use AI is programming. Six respondents (A; B; D; F; G; H) reported that the use of AI in programming tasks is common, particularly for generating code in Matlab, Python, or for statistical analysis. While programming is more common in natural sciences, respondents from both clusters indicated using AI for this purpose.

Students reportedly use AI in nearly all types of assignments, though with some exceptions of certain assignments or demographics. One respondent (G) stated that most students use AI in every assignment, while two others (F; H) indicated that daily use is common. Assignments explicitly mentioned included essays (E; F; G; H), group projects (C; F; G), homework assignments (A; B; C; F; G; H), and programming tasks (A; B; D; F; G; H). However, some respondents (B; C; D) noted that AI tools often perform poorly for some assignments in natural sciences studies. Likely due to assignments for the natural sciences cluster often being more technical and calculation-based, its respondents pointed out AI errors more than respondents from the social sciences cluster, where essays are a more common type of assignment.

5.1.4. Demographic differences

AI use also varied across demographics. One respondent (D) observed that students beyond their first year may be aware of a broader range of AI tools, whereas others (A; C; F) believed that first-year students use AI more frequently, likely because they began their studies when AI tools were already accessible. Students over 30 were said to engage with AI less, often

motivated by a deeper interest in learning "*for the passion and the craft*" (F). Additionally, some students refrain from using AI tools altogether due to personal or ethical considerations (E).

SQ1: How and Where Are Different Types of Artificial Intelligence Tools Used by Students?

Students use AI tools in diverse ways, most commonly using Generative AI tools such as ChatGPT. Other tools mentioned include AI writing assistants, AI study platforms, and academic research assistants. Prevalent uses of these AI tools include text generation, using AI as a teaching assistant, using AI for programming, using AI for inspiration, and checking grammar and language. Other applications are AI academic literature search, image generation, and plagiarism detection.

Students apply these tools for a wide range of assignments, including essays, homework assignments, projects, and programming assignments, with students from the social sciences cluster being more likely to use AI for writing assignments. More respondents from the natural sciences cluster noted that AI tools were sometimes inadequate when trying to solve certain problems than from the social sciences cluster. Many students use AI tools frequently, often daily.

Some differences between student demographics can be found, although most students are open to using AI tools. First-year students are commonly believed to utilise AI more, whereas students above 30 years of age generally tend not to engage with it.

5.2. Student Viewpoints on Artificial Intelligence

This section discerns student viewpoints on Artificial Intelligence. Subsections focus on perceived advantages and disadvantages of AI, as well as perceived good and bad practices of AI. The section finishes by providing an answer to SQ2: *How do students perceive the advantages and disadvantages of Artificial Intelligence (tools)?*

5.2.1. Perceived Advantages of Artificial Intelligence

The respondents identified several advantages from the perspective of students within their associations. The most frequently mentioned benefit involved saving time and working more efficiently with the help of AI (A; B; C; E; F; G; H). Students particularly appreciated this when dealing with time-consuming assignments (A; G). Closely related to efficiency, many respondents also pointed to the convenience of AI tools (A; B; D; E; G; H), especially because students can access them easily (B) and use them without needing to contact anyone (E).

Several respondents noted that students benefit from receiving immediate feedback on writing assignments (E; F), helping them avoid waiting for instructors. This use ties into AI's role as a useful research assistant (B; D; F), described by one respondent as "*a kind of teaching assistant*." (B).

Students also use AI to improve structure and organization in their writing (A; H). As respondent H stated: "*I know a lot of students use it to make their text look neater.*" Two respondents (B; G) mentioned that AI contributes to improving the quality of student output, for instance in programming assignments, where the programming skills of AI were deemed to be immaculate by one respondent (B).

Beyond productivity and efficiency, some respondents (A; B; E) emphasised the educational value AI can offer to students. They mentioned its potential to boost creativity (A), encourage critical thinking (B), and help students learn when used appropriately. Respondent E remarked: "*But I also think that if you use it the right way, you can still learn a great deal from it and benefit a lot.*"

Respondents (B; C; H) also identified the long-term advantage of becoming familiar with AI during one's studies, noting that students can apply these skills in the workplace. Additionally, AI tools can help students manage information overload and may support higher academic performance, which could be the difference between passing or failing (C).

5.2.2. Perceived Disadvantages of Artificial Intelligence

Respondents also described several perceived disadvantages of AI, most of which relate to negative effects on learning. Many observed that AI use can weaken critical thinking (A; B; G; H), particularly when AI tools take over making complex connections (B; G). Several noted that relying on AI might hinder the development of programming skills (B; D; G), creativity (A; G), and overall subject knowledge and understanding (B; C; D).

Half of the respondents (A; B; C; E) identified the perceived disadvantage of over-relying on AI. They argued that students risk skipping essential steps in developing problem-solving skills. Respondent B explained: "*If you never learn to take that first step from 'I don't understand the problem' to trying to solve it, you'll never be able to do it.*" Two respondents (C; E) added that using AI might take away the sense of satisfaction that comes with completing assignments or finishing a study programme.

Furthermore, several respondents (A; B; C; D; G) reported errors and limitations of AI. They reported that students encounter mistakes, in some assignments nearly all the time (B), with AI mistakes seemingly appearing more frequently in the natural sciences studies. Respondent D also mentioned that AI frequently generates non-existent references. One respondent (A) raised ethical concerns, noting that AI currently lacks the ability to think ethically. Additionally, some students choose not to use AI at all due to personal beliefs (C; E).

Some disadvantages involve social aspects. Two respondents (D; F) warned that AI poses a risk to professionalism, either by weakening students' professionalism (D) or through teachers misusing AI themselves (F). Respondents (A; E; F) also worried about the effect of AI on group work and academic integrity, and remarked that students are likely hesitant to be fully honest about their use of AI (A; E). One respondent (E) mentioned a case where the examination board questioned an entire group due to one member's suspected AI use. Respondent B noted that students may become less inclined to work together, which is often more enjoyable and helpful to them. Finally, respondent C expressed concerns about AI potentially replacing jobs in the future.

5.2.3. Perceived Good and Bad Practices with Artificial Intelligence

Respondents clearly described how most students distinguish between responsible and irresponsible AI use. Most students view copying unmodified AI output or generating entire texts as bad practice (A; B; C; D; E; F; H), whereas the perceived good practices are in line with what they believe to be responsible use of AI. Students consider it good practice to critically assess AI output (A; B; G), while failing to do so is seen as a poor approach (C).

Many examples of perceived good practices relate to later stages of the writing process. Respondents (E; F) described positive practices such as using AI to restructure existing work or to generate feedback for revision, a good practice more commonly used in the social sciences cluster. One respondent (C) noted that students should try solving a problem themselves and consult others before turning to AI.

In a programming context, respondent G stressed the importance of building a foundational understanding before using AI. They remarked: "*You see that if students start programming and already use AI at that stage, it's really damaging for their later development.*" Some students also consider it a good practice to use AI for locating academic resources (C; F).

Over-reliance on AI emerged as the most frequently mentioned bad practice. Students identified several risks: relying on AI to write complete assignments (A; B; D; E; F; H), not being critical of AI outputs (C), and depending too much on AI in programming tasks (G). This over-reliance can result in knowledge gaps, causing students to fail their exams (C; D; H). Additionally, frequent AI use might discourage collaboration with fellow students, which, as previously mentioned, is considered more fulfilling for students (B).

SQ2: How do Students Perceive the Advantages and Disadvantages of Artificial Intelligence?

Students see AI tools as beneficial for saving time, increasing efficiency, and convenience. Advantageous applications of AI include using AI tools as a teaching assistant, for feedback, improving structure, and improving output, especially in programming. Some believe

AI can support creativity, critical thinking, and learning when used responsibly. Some consider gaining experience with AI as valuable preparation for future careers.

However, respondents also express students' concerns. Students believe AI can hinder some essential academic skills, such as critical thinking, creativity, and subject understanding, especially when used too much. Over-reliance is seen as a big risk, as it may lead to students not learning essential skills. Respondents also identified that AI tools are prone to mistakes, especially in the natural sciences cluster. Other concerns include ethical issues and reduced collaboration.

Respondents describe using AI for revision, inspiration, and resource search as good practices, because it involves the responsible use of AI tools. Within these good practices, AI complements the students' skills instead of replacing them. Bad practices include copying unmodified output or relying on AI without critical evaluation.

5.3. Student Viewpoints and Ideas on University of Twente Artificial Intelligence Policy

This section outlines student viewpoints and ideas on UT AI policy. Subsections cover student viewpoints on current UT AI policies, ideas how to structure AI policies, and suggestions for developing policy on AI. The section concludes with an answer to SQ3: *How do students perceive the current Artificial Intelligence policy of the University of Twente, and what ideas do they have to build further Artificial Intelligence policy?*

5.3.1. Student Viewpoints on Current University of Twente Artificial Intelligence Policies

All respondents indicated that students in their association are generally unfamiliar with the central UT AI policy (A; B; C; D; F; G; H), or somewhat unfamiliar (E). As respondent C noted: "*I think they believe it doesn't exist.*" This familiarity extends to programme-specific

regulations on AI. Respondents reported that the permitted level of AI use is either unclear (B; G; H) or somewhat unclear (A; C; D; F), often because the rules vary by assignment, course, or teacher (B; D; F; G; H). According to respondents (B; F; G), only some assignments require an AI statement, a declaration of the types and applications of AI used.

This lack of certainty contributes to the perception that current UT AI policies are ineffective (A; B; C; D; E; F; G; H). Respondents (E; F) explained that inconsistent policy enables students to bend the rules, while others are afraid of unintentionally violating them, especially students from the social sciences cluster. This could be related to the increased emphasis on written assignments and the difficulty of detecting AI use in these assignments leading to potential fraud cases.

5.3.2. Student Perspectives on Structuring Artificial Intelligence Policies

Most respondents estimated that students view the regulation of AI as either somewhat difficult (B) or difficult (A; C; E; F; G; H), because of the difficulty of proving AI use and controlling students. To ensure successful policy, respondents (B; C; D; G; H) noted that students generally favour (re-)introducing AI policy at the programme level, and some suggested implementing policies per module (D) or per course (A; E). Two respondents (F; G) still believed that a central UT policy could serve as a useful foundation, given that decentralised policies are installed to also accommodate differences between programmes (A; B; C; D; F; G; H) or even between courses within the same programme (E).

Regarding the policymaking process, respondents shared several student suggestions. They emphasised the importance of involving relevant stakeholders (C; D; F; G; H), particularly teachers (F; G; H), to ensure that both students and teachers have a say. Respondent H

elaborated: "*Ask students what they find useful, and ask teachers where they draw the line*", underscoring the importance of consistency between students and teachers and leveraging teachers' roles in setting boundaries. Other stakeholders included CELT (C; D), *the Centre of Expertise in Learning and Teaching*, and programme committees (H). Respondents (B; D; F) noted that students encourage open-mindedness to AI during policy development, given the potential long-term benefits of AI for careers (B; F) and the possible value of integrating AI into education for students and the UT (A). Respondent H noted that some students would like to see the UT continuously evaluate and improve its AI policies.

In addition to this, respondents (F; G; H) believed that students want to define the policy goals clearly. They want clear boundaries to be set with transparent reasoning (F; H) and subject-specific examples (F). Two respondents (F; H) also highlighted the importance of defining the role of teachers in the policy framework, ensuring they follow the same rules (F) and that no discrepancy exists between what is allowed for teachers and students (H). Both respondents (F; H) observed that students sometimes perceive a double standard, feeling it is unfair that teachers and students are currently held to different expectations regarding AI use. One respondent (C) mentioned that some teachers likely avoid using AI tools to maintain authenticity.

Finally, respondents (E; F) emphasised the need to address group work in AI policy. Group assignments and projects can create complex situations, especially when accusations of AI use arise (E; F), creating the question of who is responsible and liable.

5.3.3. Student Suggestions for Developing Artificial Intelligence Policy

Respondents shared several ideas from students to make policy more visible and accessible. Many preferred that policy information be integrated into accessible sources, such as module Canvas pages (C; D; E; F; H), assignment instructions (B; C; E), or a central UT webpage (F). Canvas is the Digital Learning Environment of the UT.

Students also generally support the idea of AI education, for both students (A; B; D; E; F; G; H) and teachers (D; G; H). Respondents proposed incorporating this education into a mandatory course (B; D; E; G) or offering it as a workshop (A; H). According to respondents (A; G; H), students see the beginning of their studies as the most appropriate time to introduce this content to ensure familiarity with AI policy and responsible AI use. Two respondents (F; G) noted that education from study associations could also be helpful to students. Respondent E expressed concern that educating students on AI use might encourage them to start using AI tools. However, since most respondents assessed students as either familiar (A; B; C; D; E; G; H) or somewhat familiar (F) with AI tools already, it is unclear whether AI education would increase their use. As respondent G noted, "*I think it is very naive to think that students are not really aware of AI options now*."

Regarding regulation and enforcement, three respondents (B; C; D) from the natural sciences cluster noted that programming tasks involving AI should receive more oversight. However, one respondent (H) believed some students would prefer a lighter regulatory approach. There was some support for keeping the current AI statement (E; G), with one respondent (E) suggesting students could include a full transcript of their AI interactions.

In addition to enforcement, respondents also proposed alternative testing methods. These include written and oral exams (C; E; F; H), presentations (E), and restructured assignments that are more resistant to AI use (A; G). As respondent A explained: "*You need to make sure that assignments where students are not in the examination room are formulated in a way that AI can only serve as a starting point, and not provide the full answer.*" However, they also noted that the UT would need to investigate how to design such assignments (A).

Additional suggestions included introducing new policies as pilot studies (C) and exploring the development of AI tools for the UT.

SQ3: How do Students Perceive the Current Artificial Intelligence policy of the University of Twente, and what Ideas do they have to Build Further Artificial Intelligence policy?

Respondents indicated that students are generally unfamiliar with the current UT AI policy, and believe the current implementation of AI policy is ineffective. Reasons for this include a lack of certainty for students on the permitted level of AI use, rules varying per situation, and possible misinterpretation of policy.

Rather than implementing a single central AI policy at the UT, most respondents expressed students' demand for AI policy at a programme level or lower. Respondents shared several suggestions for structuring AI policy, emphasizing the involvement of stakeholders, particularly teachers, due to their role in setting and enforcing boundaries. Respondents also encouraged open-mindedness toward AI during the policymaking process.

Students view the regulation of AI as a difficult task. To ensure successful policies, students believe clear goals need to be defined prior to drafting new policies. These goals include establishing clear boundaries with transparent reasoning and concrete examples. Additionally, students suggest considering the role of teachers in AI policy and AI use in group projects. Particularly social sciences students underscore the importance of involving stakeholders, identifying goals, and identifying the role of teachers during the policy-making process.

Respondents suggested different ideas to develop AI policy. To increase visibility, students recommend placing policies in accessible locations such as Canvas module pages or included in all assignments. Students perceive AI education for students and teachers to be useful, for students particularly by integrating AI education in courses or workshops into the curriculum. Respondents disputed the areas where AI needs more or less regulation, specifically programming tasks. From the current policy, keeping the AI statement was identified as a positive measure. Furthermore, numerous students consider alternative testing methods to be useful alternatives to assignments, including exams, presentations, and restructured assignments.

5.4. Differences and Similarities Between Clusters

This section outlines notable differences and similarities between the natural sciences and social sciences cluster, following the structure of the previous three sections. Differences and similarities of each section are presented using a table and a short description. It is important to note that these comparisons do not imply that the observations apply to all students within a given cluster, but aim to reflect general patterns from the data.

Theme	Natural Sciences (A-D)	Social Sciences (E-H)
Familiarity with AI	High familiarity, high frequency of use	High familiarity, high frequency of use
AI tools used	Generative AI (mostly ChatGPT), writing assistants	Generative AI (mostly ChatGPT), writing assistants, AI study platforms, academic research assistants
Patterns of AI use	Focus on programming tasks, feedback, and clarification	Focus on writing tasks, structure, inspiration, and feedback

Table 1: Comparison of AI tools and usage patterns across clusters

Students from both clusters indicate a high level of familiarity with and frequent use of AI tools, particularly mentioning ChatGPT in both clusters. Although students from the social sciences cluster are able to identify more types of AI tools, generative AI is used most commonly in both clusters. Usage patterns between clusters differ slightly, as social sciences students rely more on AI for writing support, idea generation, and structuring texts, reflecting the higher number of writing assignments in their programmes. Natural sciences students more often use AI tools for programming tasks, feedback, and clarification.

Theme	Natural Sciences (A-D)	Social Sciences (E-H)
Perceived advantages	Efficiency, convenience, AI can improve academic skills and has long-term benefits	Efficiency, convenience, direct feedback on writing assignments
Perceived disadvantages	Over-reliance, reduced academic skills, AI errors	Risk to professionalism, risk of academic integrity and effect of AI on group work, reduced academic skills
Perceived good practices	Critical assessment of	Restructure existing work or

	output, asking AI for hints	generate AI feedback
Perceived bad practices	Over-reliance on AI output	Over-reliance on AI output

Table 2: Comparison of perceived advantages, disadvantages, good and bad practices

The comparison in Table 2 shows that students from both clusters identify similar advantages of AI, particularly efficiency and convenience. However, social sciences students emphasize receiving direct feedback for writing as a perceived advantage, while natural sciences students note the potential of AI to support academic skill development and long-term benefits. In terms of disadvantages, both clusters are concerned about over-reliance and reduced academic skills, although the skills at risk differ per cluster. Social sciences students mostly identify critical thinking as an area of risk, whereas natural sciences students are also concerned about programming skills and subject understanding. Social sciences students more often mention risks related to professionalism, group work, and academic integrity. Natural sciences pointed out errors more often, which could be due to the more technical nature of their assignments.

Good practices differ slightly, with natural sciences students focusing on critical assessment of AI output, while social sciences students emphasize using AI to restructure existing work or generate AI feedback. Despite these variations, both groups agree that over-reliance on AI constitutes bad practice.

Theme	**Natural Sciences (A-D)**	**Social Sciences (E-H)**
Perception of current UT AI policy	Unclear and ineffective	Unclear and ineffective, concerns of teacher-student double standards
Ideas on structuring AI policies	Decentralized policy, involve stakeholders, encourage open-mindedness	Decentralized policy, involve stakeholders, clearly define goals and boundaries

Ideas for AI policies	Increase visibility, AI education, more programming oversight, alternative testing methods	Increase visibility, AI education, keep AI statement, alternative testing methods

Table 3: Comparison of perceptions and ideas regarding UT AI policy

Students from both clusters were unfamiliar with UT AI policy and perceived it as ineffective. Social sciences students additionally raise concerns about inconsistency between teachers and students. Across both clusters there is support for decentralized policies, with students from both clusters emphasizing the importance of involving stakeholders. Social sciences students more explicitly call for clearly defined goals and boundaries, and natural sciences students encourage open-mindedness during the policy-making process. Regarding future policies, both clusters call for increased visibility and consider AI education as a worthwhile initiative. From the current policy, social sciences students suggest keeping the AI use statement. Students from both clusters support alternative testing methods to ensure student development in key areas. Natural sciences students further highlight the need for more programming oversight.

6. Discussion

This chapter compares the results from chapter *5.1 Results* to the expectations formulated in chapter *2.4. Research expectations*, before discussing possibly significant implications of the results.Again, please note that the term students refers to students from the study associations (1-8) of the respondents (A-H), and not the University of Twente student population as a whole.

The first expectation – "*Students will possess at least some level of familiarity with different Artificial Intelligence tools and have used these on a regular basis."* – Is largely confirmed. Concerning the familiarity, it is safe to say that the expectation is upheld, considering that nearly all students were estimated to be familiar with AI tools. However, the results found that students often only use ChatGPT, with the exception of a few others mentioned. It becomes clear that ChatGPT has grown immensely, whereas the adoption of other applications of AI is still in the early stages. Regarding frequency of use, most students use AI tools frequently, which is in line with the expectation. This outcome is significant as it shows that AI use among students is often unavoidable, highlighting the need for policy to shift from restricting AI use to supporting responsible use.

The second expectation – *Students will perceive efficiency as an advantage, but may overlook the negative consequences on student performance* – is somewhat supported. Respondents stated the negative effects of over-relying on AI on student performance, such as a decline in academic skills. Convenience and over-reliance appear closely linked, suggesting that AI use may hinder student performance in some cases. However, this is difficult to conclude, as many students adopt good practices to negate potential negative effects of AI use. While the bad practice of copying unmodified output does occur, students generally mostly do not do this.

First-year students are the most likely demographic to align with the expectation, due to their frequency of AI use. The outcome addresses the need for policy to manage AI use in a way to benefit students as much as possible, whilst reducing the risks.

The third expectation – *Students will show some awareness of the risks associated with AI, and are likely to not have had education on the topic* – is largely supported. None of the respondents indicated that students had received education on the topic of AI from the UT, although most students consider integrating AI education into the curriculum via workshops or mandatory courses as a good initiative. Many students are aware of risks associated with AI use, particularly as a result of over-relying on AI. Additionally, AI errors can cause students to deliver faulty output. However, repercussions of wrongful AI usage from the UT are unclear to some, who therefore perceive it as a risk to use any sort of AI tools. The significance of this outcome lies in the clear gap between awareness and guidance. Although many students are aware of the risks associated with AI, they would appreciate more clarity and guidance on how to manage these risks.

The fourth expectation – *Students will generally consider clear AI policy reasonably important but will not want a full ban on AI tools* – is largely supported. It could be argued that students consider AI policy to be incredibly important as opposed to reasonably important. Almost all students opposed a full ban, with the exception of students who do not use AI due to personal beliefs. Instead, given the widespread notion that AI can be greatly beneficial when proper AI policy is put in place, and that AI will only continue to grow in popularity and develop, students consider it important to develop effective AI policies at the UT. The outcome shows the students' needs for clear and constructive AI policies. To develop these policies, many students are willing to participate in the policymaking process.

Reflecting more broadly on the theory in relation to the results, it becomes clear that, although the familiarity with AI and frequency of AI use have greatly increased, most of the disadvantages identified in the literature remain relevant. Respondents noted that AI tools are still prone to errors, despite recent improvements, while clear training and guidelines are often lacking, and teachers continue to struggle with adapting to AI. These findings illustrate the rapid emergence of AI in higher education, and the inability of academic institutions to keep pace with the technological developments. This gap aligns with what is described in the pacing problem, as the technological innovations of AI appear to advance faster than the development of AI policy. The Collingridge dilemma possibly explains this, as the UT may have been hesitant to develop and implement AI policy without fully understanding its impact, but this delay has now made it significantly more difficult to control AI use and develop policy. These frameworks could help explain why persistent issues identified as early as 2022 have not yet been effectively addressed according to students.

The results also point to broader implications for how AI policy at the UT can be improved. Although some students would appreciate stronger enforcement in some areas, most students also recognise the difficulty of regulating AI use and doubt that stricter policies would have significant impact. Instead, three policy improvement categories were identified that students want to see reflected in the AI policies: AI education to disencourage students to use AI irresponsibly and clearly explain relevant AI policies, improved visibility by integrating policy into Canvas and assignments, and alternative testing methods. These suggestions would shift the AI policy function from enforcement toward delineating unresponsible AI usage and encouraging responsible AI usage, in line with the goal of establishing clear boundaries.

Furthermore, most students suggested implementing new policies at a decentralised

level, which each have their own implications in regard to enforcement. If new policies are developed per course, the current situation of varying rules and a lack of certainty on the permitted level of AI use will likely persist. Implementing policy per module could have a similar effect, although likely slightly reduced. Implementing policies at study programme level increases consistency, but does not account for considerably different courses or modules. Although most students agree that AI policy should not be implemented centrally, further consideration is necessary in deciding on the level at which policy should be implemented.

From the results, we can identify relevant insights to help shape the future of AI policies at the UT. Firstly, the knowledgeability of students on AI tools, including its advantages and disadvantages, is higher than what was expected from the literature. Students' knowledge can be valuable in several stages of the policymaking process, such as identifying problematic usage of AI tools,shortcomings of current AI policy, and effective strategies for implementation. Not considering student views can pose potential risks to policy-making, such as students perceiving future policy as unclear or unfair, or policy not addressing student usage patterns, which could make policy ineffective. Additionally, most students express at least some willingness to participate in the policy-making process, and involving them meaningfully in the policymaking process might improve their willingness to adhere to the policy.

7. Conclusion

This case study of students at the University of Twente – specifically from students within the clusters of natural sciences and social sciences – provides relevant insights on the use of Artificial Intelligence among students. This research aimed to explore the perspectives of students in the context of AI and AI policy at the UT. To do so, the main research question was put forward:

"How do students at the University of Twente use and perceive Artificial Intelligence tools and University of Twente Artificial Intelligence policies, and what are their views on future University of Twente Artificial Intelligence policy?"

Most students at the UT from both clusters use AI frequently and in diverse ways. Most commonly students rely on generative AI tools such as ChatGPT. They apply AI tools for text generation, programming support, inspiration, grammar checking, and clarification, with usage patterns varying slightly between the two clusters. Students from the social sciences cluster tend to use AI more for writing and idea development, while those in the natural sciences focus more on programming tasks. Assignments where students employ AI tools include essays, homework assignments, group projects and programming assignments.

Students perceive AI tools as beneficial for improving efficiency, enhancing output quality, and supporting learning when used responsibly. However, they also express concerns about over-reliance, reduced critical thinking, loss of subject understanding, and ethical issues. They distinguish between responsible and irresponsible use, identifying good practices such as using AI for revision or inspiration, and bad practices such as copying unmodified output or

bypassing their own thinking. Most students believe that, when the good practices are upheld, the use of AI tools are advantageous for academic performance.

In terms of policy, most students are unaware of the current UT AI policy and/or perceive it as unclear, inconsistent, and difficult to locate. Students generally oppose a full ban on AI tools, instead favouring guidance that supports the realities of student AI use. Students strongly support the development of clear, accessible, and context-specific policies, preferably at a programme, course, or module level, rather than only a centralised approach. They emphasise the importance of defining the goals of AI policy, establishing transparent boundaries, and including concrete examples of permitted use. Students also stress the need for consistent expectations between students and teachers. To ensure effectiveness, they recommend involving all relevant stakeholders, especially teachers, in the policymaking process. Most students support embedding AI education into the curriculum to promote responsible use and call for greater visibility of policies by integrating them into Canvas modules, assignment briefs, or central UT web pages. Some also suggest exploring alternative assessment methods, such as presentations or exams, in cases where AI use may interfere with learning outcomes.

To answer the main research question briefly: students frequently use AI in various ways and are mostly aware of the advantages and disadvantages of AI use, perceiving it as beneficial when good practices are followed. However, students are largely unfamiliar with the UT AI policies and perceive them as unclear and inconsistent, and therefore ineffective. Students recommend developing clear, accessible, and decentralised policies by properly defining the policies' goals and boundaries and involving relevant stakeholders in the process. Students emphasise the need for improved visibility of AI policies, and could benefit from introducing AI

education to instruct students on responsible AI use and alternative assessment methods where appropriate.

In addition to providing an overview of students' perspectives on AI, this research offers several key insights into AI use in higher education and implications for AI policy development. While most students are familiar with and frequently use AI tools, they are largely unfamiliar with UT AI policy and generally perceive it as unclear and ineffective. As it is unrealistic and not to the benefit of students to install a complete ban, it becomes incredibly important for academic institutions to implement clear policies to guide and control students in using AI.

Most students are able to identify advantages and disadvantages of AI use, but there is a challenge of balancing convenience with the risk of over-reliance. Determining this balance will be a challenge for future policy-makers. Additionally, it is important to have the debate on which level new policy should be introduced at. Due to the large variation in study programmes, a decentralised approach may offer flexibility, while a central framework could ensure coherence. Finally, the research indicates that students have constructive ideas about AI policy and show a willingness to participate in the policy-making process. Actively involving students may contribute to policies that are better aligned with educational practices and more widely supported by students.

This research addresses the knowledge gap surrounding AI usage among students by providing a current and nuanced overview of student perspectives surrounding the use of AI tools at the UT. Additionally, student perspectives on AI policies and their ideas to develop AI policies are described in detail, which have received limited attention in previous research. As such, the findings can support the UT, and potentially other academic institutions in the

Netherlands, in designing AI policy by illustrating core areas to be addressed, potentially effective implementation strategies and students' attitudes towards AI policy and their role in the policymaking process.

In terms of scientific relevance, this research contributes to a highly topical and fast-evolving field by centering student perspectives, an essential yet underrepresented stakeholder group in AI policy discussions in higher education. The insights presented can serve as a theoretical framework for further research, especially applied research aimed at developing concrete policy recommendations. Additionally, this research reveals gaps between theory and practice, as well as persistent issues that remain largely unaddressed.

7.1. Policy Recommendations

Although the purpose of this research is not to deliver full policy recommendations, it is interesting to discern how academic institutions can use this research to navigate the policy-making process surrounding AI, and to (further) develop new or existing AI policy.

In the policy-making process, students consider it important that AI policies clearly state what their objectives are, how much and which uses of AI are allowed, and where policy documents can be found. Based on these perspectives, it is advisable to involve all relevant stakeholders and establish clear boundaries. This process should also address the balance in permitted AI use between teachers and students, the appropriate level for introducing new policies, and AI use within a group context. To improve the accessibility of policy documents, students suggest placing them in multiple places such as Canvas pages, assignment documents, and/or central UT webpages. This is important, since even well-crafted policies lose value if students are unable to find them.

Finally, the findings suggest that academic institutions may want to re-evaluate which core skills students must possess at the end of their studies, and focus on preserving these skills by educating students on how to use AI responsibly and implementing AI-resistant assessment methods when AI is deemed obstructive for a students' learning.

7.2. Suggestions for Further Research

As the time available for this research was limited, it did not allow for students from all studies of the UT to be researched in this thesis. For further research, it is recommended to, where possible, involve students from as many studies as possible to greatly improve the generalizability of the results. Also involving employees within the UT or other stakeholders in the policy-making process would be useful to consider, as well as experts on the topic of AI in higher education. Performing this research in the same context, but within other cases of Dutch universities, would be a good way to validate or disprove the results from this research.

Furthermore, a good next step would be to test the generalizability of the results by distributing a quantitative survey among UT students based on this research's findings to see if they align with the opinion of a wider student demographic.

Lastly, performing further research on student perspectives of AI is especially valuable after new developments in AI or AI policy take place. Technological advancements of AI have the potential to impact student perspectives on the use of AI and its advantages and disadvantages, whereas new or adjusted policies can lead to student perspectives on AI policies changing.

8. References

Allen, L. K., Jacovina, M. E., & McNamara, D. S. (2016). Computer-Based writing instruction. In *Handbook for Writing Research* (pp. 316–317). http://files.eric.ed.gov/fulltext/ED586512.pdf

Al-Tkhayneh, K. M., Alghazo, E. M., & Tahat, D. (2023). The Advantages and Disadvantages of using artificial intelligence in education. *Journal of Educational and Social Research*, *13*(4), 105. https://doi.org/10.36941/jesr-2023-0094

Babbie, E. (2013). *The Practice of Social Research* (13th ed.). Wadsworth CENGAGE Learning.

Baidoo-Anu, D., Asamoah, D., Amoako, I., & Mahama, I. (2024). Exploring student perspectives on generative artificial intelligence in higher education learning. *Discover Education*, *3*(1). https://doi.org/10.1007/s44217-024-00173-z

Banh, L., & Strobel, G. (2023). Generative artificial intelligence. *Electronic Markets*, *33*(1). https://doi.org/10.1007/s12525-023-00680-1

Bogner, A., Littig, B., & Menz, W. (2009). Introduction: Expert Interviews — an introduction to a new methodological debate. In *Palgrave Macmillan UK eBooks* (pp. 1–13). https://doi.org/10.1057/9780230244276_1

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/qrj0902027

Brandon, E., Eaton, L., Gavin, D., & Papini, A. (2025, May 29). *In the Room Where It Happens: Generative AI Policy Creation in Higher Education*. Educause Review. https://er.educause.edu/articles/2025/5/in-the-room-where-it-happens-generative-ai-policy-creation-in-higher-education?utm_source=chatgpt.com

Churi, P. P., Joshi, S., Elhoseny, M., & Omrane, A. (2022). Artificial intelligence in higher education. In *CRC Press eBooks*. https://doi.org/10.1201/9781003184157

Collingridge, D. (1982). *The Social Control of Technology*. Palgrave Macmillan.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches, 2nd ed.* (2nd ed.). SAGE Publications. https://psycnet.apa.org/record/2006-13099-000

Downes, L. (2010). The laws of disruption: harnessing the new forces that govern life and business in the digital age. *Choice Reviews Online*, *47*(09), 47–5117. https://doi.org/10.5860/choice.47-5117

Etikan, I. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1. https://doi.org/10.11648/j.ajtas.20160501.11

European Parliament. (2020, April 9). *What is artificial intelligence and how is it used?* https://www.europarl.europa.eu/topics/en/article/20200827STO85804/what-is-artificial-in%20telligence-and-how-is-it-used

Examination Board BMS. (2025). ANNUAL REPORT 2023-2024 OF THE EXAMINATION BOARDS BMS. In *University of Twente* [Report]. https://www.utwente.nl/en/bms/examboard/documents/Annual%20report/annual-report-examination-boards-bms-2023-2024-final.pdf

Fetzer, J. H. (1990). What is Artificial Intelligence? In *Studies in cognitive systems* (pp. 3–27). https://doi.org/10.1007/978-94-009-1900-6_1

Graesser, A. C., Conley, M. W., & Olney, A. (2011). Intelligent tutoring systems. In *American Psychological Association eBooks* (pp. 451–473). https://doi.org/10.1037/13275-018

Johnston, H., Wells, R. F., Shanks, E. M., Boey, T., & Parsons, B. N. (2024). Student perspectives on the use of generative artificial intelligence technologies in higher education. *International Journal for Educational Integrity*, *20*(1). https://doi.org/10.1007/s40979-024-00149-4

Karthikeyan, J., Ting Su Hie|, & Ng Yu Jin (Eds.). (2021). *Learning Outcomes of Classroom Research*. L ORDINE NUOVO PUBLICATION. https://core.ac.uk/download/pdf/523285678.pdf#page=76

Khare, K., Stewart, B., & Khare, A. (2018). Artificial intelligence and the Student Experience: An Institutional perspective. *IAFOR Journal of Education*, *6*(3), 63–78. https://doi.org/10.22492/ije.6.3.04

Lewis-Beck, M. S., Bryman, A., & Futing Liao, T. (2004). Semistructured interview. *The SAGE Encyclopedia of Social Science Research Methods*. https://doi.org/10.4135/9781412950589.n909

Likert, R. (1932). *A TECHNIQUE FOR THE MEASUREMENT OF ATTITUDES*. Archives of Psychology. https://legacy.voteview.com/pdf/Likert_1932.pdf

Malik, A. R., Pratiwi, Y., Andajani, K., Numertayasa, I. W., Suharti, S., Darwis, A., & Marzuki, N. (2023). Exploring Artificial Intelligence in Academic Essay: Higher Education Student's perspective. *International Journal of Educational Research Open*, *5*, 100296. https://doi.org/10.1016/j.ijedro.2023.100296

Moya, B., Eaton, S., Pethrick, H., Hayden, A., Brennan, R., Wiens, J., & McDermott, B. (2024). Academic Integrity and Artificial Intelligence in Higher Education (HE) Contexts: A Rapid Scoping Review. *Canadian Perspectives on Academic Integrity*, *7*(3). https://doi.org/10.55016/ojs/cpai.v7i3.78123

OpenAI. (2022, November 30). *Introducing ChatGPT*. https://openai.com/index/chatgpt/

Özer, M. (2024). Potential Benefits and Risks of Artificial Intelligence in Education. *Bartın University Journal of Faculty of Education*, *13*(2), 232–244. https://dergipark.org.tr/en/download/article-file/3645204

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2013). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, *42*(5), 533–544. https://doi.org/10.1007/s10488-013-0528-y

Russell, S. J., & Norvig, P. (2022). *Artificial Intelligence: A Modern Approach* (4th ed.). Pearson.

University of Twente. (n.d.-a). *AI and assessment*. https://www.utwente.nl/en/examination/Additional_topics/AI_Assessment/

University of Twente. (n.d.-b). *Beneficial use of AI for teaching, learning and assessment*. https://www.utwente.nl/en/examination/Additional_topics/AI_Assessment/AI_Beneficial_Teaching_Assessment/

University of Twente. (n.d.-c). *Study and student associations | University of Twente*. https://www.utwente.nl/en/education/bachelor/studentlife/associations/#student-associations

University of Twente. (n.d.-d). *Use of AI in education at the University of Twente*. https://www.utwente.nl/en/learning-teaching/Expertise/ai-in-education/use-of-ai-in-education-at-the-university-of-twente.pdf

Von Garrel, J., & Mayer, J. (2023). Artificial Intelligence in studies—use of ChatGPT and AI-based tools among students in Germany. *Humanities and Social Sciences Communications*, *10*(1). https://doi.org/10.1057/s41599-023-02304-7

Von Soest, C. (2022). Why do we speak to experts? Reviving the strength of the expert interview method. *Perspectives on Politics*, *21*(1), 277–287. https://doi.org/10.1017/s1537592722001116

Wang, W., & Siau, K. (2018). *Ethical and Moral Issues with AI -- A Case Study on Healthcare Robots*. https://www.researchgate.net/profile/Keng-Siau-2/publication/325934375_Ethical_and_Moral_Issues_with_AI/links/5b97316d92851c78c418f7e4/Ethical-and-Moral-Issues-with-AI.pdf

Xiao, P., Chen, Y., & Bao, W. (2023). Waiting, Banning, and Embracing: An Empirical Analysis of Adapting Policies for Generative AI in Higher Education. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2305.18617

Yin, R. K. (2012). Case study methods. In *American Psychological Association eBooks* (pp. 141–155). https://doi.org/10.1037/13620-009

Appendix A: Coding scheme

Table A1: Coding scheme used for chapter 5.1. Artificial Intelligence usage among UT students

Term	Theme	Codes
Level of familiarity with Artificial Intelligence	Level of familiarity	Unfamiliar Somewhat unfamiliar Neutral Somewhat familiar Familiar
Different AI tools	AI tools	Generative AI AI Writing Assistant Academic Research Assistants AI Study Platform Other
Categories of use for Artificial Intelligence	Categories of use for Artificial Intelligence	Image generation Grammar & language checker Text generation Qualitative Coding Code Generation (programming) Research assistant Clarification Finding resources Plagiarism check Inspiration Other
Frequency of AI usage	Frequency of AI usage	Never Rarely Occasionally Regularly Frequently
Different student categories	Different student categories	Master/Bachelor students Younger/Older students Dutch/International students AI pioneers/critics first-years/higher-years

Table A2: Coding scheme used for chapter 5.2. Student viewpoints on Artificial Intelligence

Term	**Theme**	**Codes**
Perceived advantages	Educational	Direct feedback Supports future work Educational/instructive Boosts academic performance
	Efficiency & workflow	Efficiency & time-saving Improves structure & organization Enhances quality of output Convenience
	Research	Helps manage information (overload) Good research assistant
Perceived disadvantages	Educational	Weakens subject knowledge & understanding Over-reliance on AI / reduced self-reliance Decreases creativity Reduces critical thinking Takes away satisfaction Decline in technical skills
	Social/professional	Destimulates teamwork Takes away jobs Risk to professionalism Risk to academic integrity Bad impact on teamwork
	Ethical/functional	AI errors & limitations Conflict with personal beliefs
Perceived good practices		Critically checking AI output Using AI after building foundational knowledge Using AI to restructure existing texts Using AI for feedback and revision Using AI selectively Using AI to locate references
Perceived bad practices	Over-reliance on AI	Copy-pasting AI output without modification

		Generating entire texts with AI Not being critical of AI output Over-relying on AI for programming tasks
	Detrimental for learning	Using AI instead of collaborating Using AI before trying to solve independently

Table A3: Coding scheme used for chapter 5.3. Student viewpoints and ideas on University of Twente Artificial Intelligence policy

Term	**Theme**	**Codes**
Level of familiarity with UT AI policy	Level of familiarity with UT AI policy	Unfamiliar Somewhat unfamiliar Neutral Somewhat familiar Familiar
Study programmes' handling of AI	Clarity of permitted AI use	Unclear Somewhat unclear Neutral/unsure Somewhat clear Clear
	Responsibility for Deciding AI Use in Assignments	Teacher determines AI use Student determines AI use Unclear who decides
	Formal requirements for AI use	Required to add AI statement Not required to add AI statement Unclear
Perceived effectiveness of UT AI policy	Perceived effectiveness of UT AI policy	Ineffective Somewhat ineffective Neutral Somewhat effective Effective
Perceived importance of clear AI policies	Perceived importance of clear AI policies	Unimportant Somewhat unimportant Neutral Somewhat important Important
Suggested policy level	Suggested policy level	Policy per course

		Policy per module Policy per study programme Policy per study cluster Policy per faculty Policy university-wide
Perceived difficulty of regulating Artificial Intelligence policy	Perceived difficulty of regulating Artificial Intelligence policy	Easy Somewhat easy Neutral Somewhat difficult Difficult
Ideas to build further policy	Improving visibility	Make separate Canvas page Integrate policy into all courses Add policy to each assignment Teachers showing knowledge of AI policy Make document(s) or webpage(s) easy to find Quarterly meetings study programme and students
	Regulation & enforcement	Loosen up policy for programming Regulate programming more strictly Regulate scientific writing more strictly Keep the AI use statement Require transcript of AI interaction as appendix
	Alternative testing methods	Written exams Oral exams Presentations Make assignments more AI-resistant
	Goals of AI policy	Set clear boundaries Establish vision Transparency Explain reasoning behind the policy Ensure all teachers agree to and comply with the AI policy Ensure consistency between students and teachers
	Process-related ideas	Continuously keep developing and/or evaluating policy Involve stakeholders Encourage open-mindedness toward Artificial Intelligence

		Start with a pilot Consider developing UT Artificial Intelligence
	Suggested involved stakeholders	Teachers Students Programme directors Programme committee CELT Study associations
	AI education	AI education for students via mandatory course AI education for students via workshop(s) AI education for students via study association AI education for teachers

Appendix B: AI Statement

During the preparation of this work the author used ChatGPT in order to turn identified key concepts into categories during the coding process, and request feedback on writing. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the work.