OULUN AMMATTIKORKEAKOULU

THE IMPACT OF AI TOOLS ON STUDENTS LEARNING IN HIGHER EDUCATION

A Case Study of Oulu University of Applied Sciences

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ABSTRACT

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Higher education is rapidly changing with the arrival of Artificial intelligence.AI tools such as assignment assistants, grammar checkers, and automated feedback systems have become an important part of students' academic activities. Although these resources are helpful, there are concerns with quality of academic work, critical thinking, and ethical considerations. It is important to understand how AI is using in higher education to make sure that AI improves learning rather than removing basic academic skills.

This thesis explored the impact of using AI tools on student learning in higher education with focus on degree students at Oulu University of Applied Sciences. The study aimed to assess current AI usage, identify benefits and risks, ethical considerations and provide recommendations for optimizing the integration of AI tools in academic learning at OAMK.

The literature review consists of an introduction to AI, key types and techniques, the evolution and trends, AI tools and theories. The literature review sources based on academic journals, books, and online articles from reputed sites. The thesis used a mixed method approach combining with a survey and semi-structured interviews. A survey was conducted to identify user demographics, current usage, student perceptions, and ethical implications. Semi structured interviews conducted with selected five students for deeper qualitative insights into students' perceptions and experiences. Thematic analysis used to identify common patterns of qualitative data. Statistical analysis is used on quantitative data to identify trends and correlations of using AI among students in academic work.

This thesis provides a valuable insight into the impact of using AI tools on student learning in higher education at Oulu University of Applied Sciences.

Keywords: Artificial Intelligence, AI Tools, Students learning, Higher Education, Impact, AI usage, Ethical Consideration, Benefits and Risks

CONTENTS

GLOSSARY

AGI	Artificial General Intelligence - An AI that can do any intellectual work that a human can.
AI	Artificial Intelligence – The ability of computer programs to carry out tasks with human intelligence.
AIED	Artificial Intelligence in Education – The application of AI technology to improve learning and teaching.
ANI	Artificial Narrow Intelligence – AI designed to perform narrow task.
ASI	Artificial Super Intelligence – Hypothetical AI that exceed human intelligence.
ChatGPT	Chat Generative Pre-Trained Transformer – OpenAI's AI language model generating human like text.
CV	Computer Vision – A field of computer science enabling computers to identify and understand visual.
GenAI	Generative Artificial Intelligence – AI that can create new content
ML	Machine Learning – A subfield of AI that computers learn from data without direct programming.
NL	Natural Language – Human languages that AI uses to generate and understand language.
OAMK	Oulun Ammattikorkeakoulu (Oulu University of Applied Sciences) – A university of applied science in Finland.
TTS	Text-to-Speech – Technology that converts written text into spoken words using AI.

1 INTRODUCTION

Artificial intelligence becomes a necessary component in our daily life. It impacts main sectors including business, communication and healthcare. AI powered tools such as virtual assistants and automated customer services are revolutionizing the way people use technology nowadays. The development of these AI powered tools has spread into areas like writing and decision making. However, though it has significant advantages, it also has significant ethical issues, technology dependence and bias.

Artificial intelligence has become an important part of modern education. Nowadays students are using AI tools on grammar correction, assignment assistance, research assistance and many more, without knowing it impacts on the quality of work, their critical thinking ability and academic work. It is essential to understand how AI is used in higher education to make sure that it helps to enhance students learning or not. This thesis focuses on degree students at Oulu University of Applied Sciences (OAMK) understanding their experience and exposure to AI tools and concepts.

The purpose of this thesis is to explore the impact of AI tools in higher education by focusing on degree students at OAMK. The objectives of this thesis include assessing the current usage of AI tools among students at OAMK, exploring the ethical considerations of using AI tools in higher education, identifying both benefits and risks of using AI tools in higher education, and to provide recommendations for optimizing the integration of AI tools in academic learning at OAMK.

The research problem focuses on exploring how AI tools impact academic learning among degree students at OAMK. This thesis examines the answers to these research questions; How do AI tools currently used by students at OAMK? How do students at OAMK view the use of AI tools in their academic learning? What are the ethical considerations for student's learning activities when using AI tools in academic works?

To find answers to these research questions, the thesis used a mixed- method approach. This thesis conducted a survey targeted at students and conducted semi-structured interviews with few students for deeper understanding. By understanding these, the thesis aims to identify benefits and risks of using AI tools in higher education and provide recommendations for optimizing the use of AI tools in higher education processes at OAMK.

It is important to know about AI tools in OAMK, since it provides deep insight into how degree students use AI tools in academic work and how it impacts their learning outcomes. Due to the rapid growth of AI, Universities should maintain clear guidelines, ethical framework to avoid mis use and enhance academic quality. This thesis will help Oulu University of Applied Sciences to understand student’s perspectives and identify risks.

2 ARTIFICIAL INTELLIGENCE

The Turing test is the first illustration of the AI concept, which is introduced by Alan Turing in the 1950s (The Turing Test (Stanford Encyclopaedia of Philosophy/Winter 2021 Edition) 2021). Alan Turing is considered the father of modern computer science (Koppes 2012).

Artificial intelligence has been a trending topic of study for a long time. AI terms are always imagined as humanoid robots. That is because often AI explain with a picture of robots or digital brain. However, AI is much more common in everyday life. We regularly get connected with AI through various digital platforms that we use on daily basis, such as Meta (Facebook), YouTube, Amazon, Google maps, Google translator and more. These systems consist of amazing abilities like voice recognition, image processing, decision- making, language translation, finding places, and even creativity. (Chan & Colloton 2024,1.)

AI simply can refer to a machine that works and thinks like a human being. It is specially using computational models and algorithms that helps machines to do human tasks like decision making, problem solving, and collecting information. The core function of AI system is to use complex algorithms methods to process large volumes of data. In simply, AI systems study data, identify patterns and then improve it to act like a human. Artificial intelligence is a very broad field. There are key subfields like machine learning, natural language processing, and computer vision that help AI to improve and be more advanced. (Urmeneta et al. 2024, 6-7.)

2.1 Key Types and Techniques of AI

Artificial intelligence has made a major difference since the 1950s. According to experts it has undergone a lot of modifications and improved. AI is becoming more advanced with each invention. The types of AI can be identified based on its capabilities and functionalities. Again, it can be divided into three main types based on its capabilities. They are Artificial Narrow Intelligence (ANI), Artificial

General Intelligence (AGI), and Artificial Super Intelligence (ASI). However, artificial narrow intelligence is the only AI that is currently in use. All other AI types are only theoretical. (Team 2023; Chan & Colloton 2024, 1-2.)

Artificial Narrow Intelligence refers to AI that is designed to perform a particular task. These systems use large amounts of data to complete tasks accurately. Anyhow, they are unable to perform activities that require human-like intelligence. There are just a few useful applications that ANI has produced, such as Siri, Alexa, GPS navigation, sensors using self-driving cars, and fraud detection systems. These systems only can perform tasks they have designed for therefore ANI mostly considered as weak AI. (Chan & Colloton 2024, 2-3.)

AI can be divided into four main types based on its functionalities. They are Reactive Machine AI, Limited Memory AI, Theory of Mind AI, and Self-Aware AI. Theory of Mind AI and Self- Aware AI are still at a theoretical level. Reactive Machine AI operates without a memory. That means it cannot retain previous experiences and take decisions based on that. These AI systems are designed to do only particular jobs and solely rely on real time data. IBM Deep Blue, Netflix and YouTube recommendations, and face recognition systems are the best examples for this. Limited Memory AI can refer past data, which allows it to enhance performance over time. Though it can make decisions based on past data, this data is not stored permanently for future reference. Generative AI, virtual assistants, chatbots, and self-driving cars are examples of Limited AI. (Team 2023.)

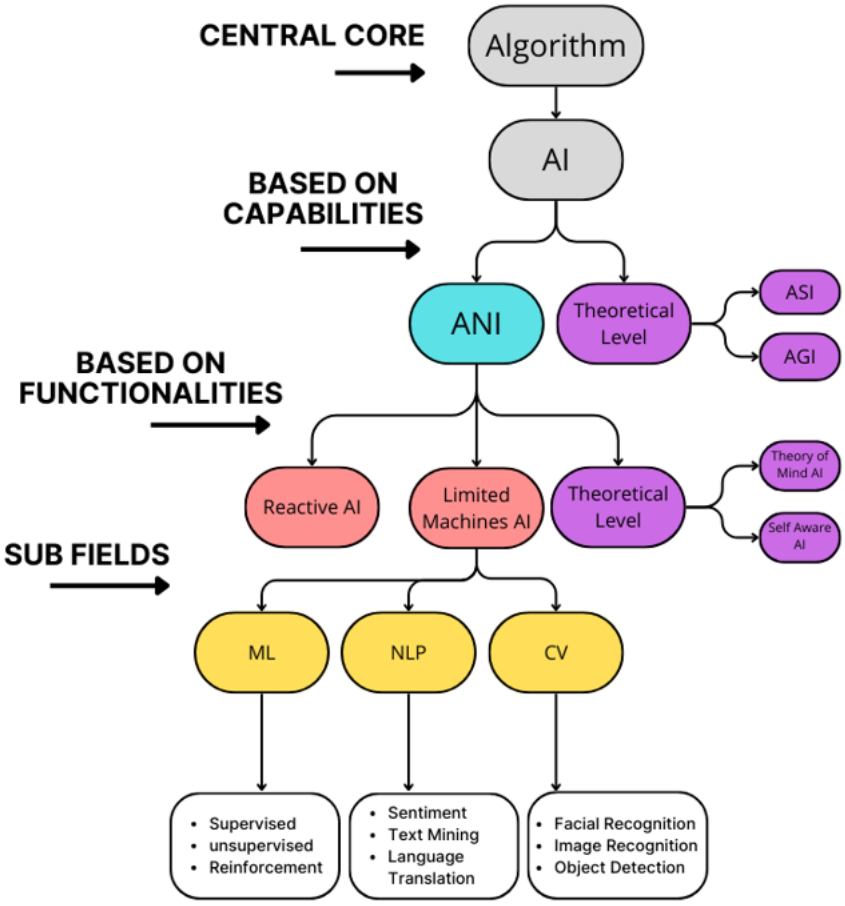

FIGURE 1. Key Types and Techniques of AI (Author's own work using CANVA)

2.2 The Evolution and Trends of AI

Generative AI is the fast growing and widely used AI type comparing with all other types, and these systems are designed to create pictures, messages, visuals, audio, code and even complex multimedia systems. However, these systems have the ability to identify and recreate patterns and styles based on data provide by user. Furthermore, they have trained to strength abilities of machine learning and deep learning. (Farrelly & Baker 2023.)

There are two types of GenAI, they are Discriminative modelling and Generative modelling. Discriminative modelling is a machine learning technique that can categorize existing data into several groups. This model cannot understand how the data is generated, but it focuses on identifying boundaries between various classes. Due to that capability, this model falls under the supervised machine learning tasks. On the other hand, Generative modelling refers to creating new data by identifying its pattern and styles which it has trained. Due to its ability to produce new data from existing data, it falls under the unsupervised and semi-supervised tasks. (Chan & Colloton 2024,9-10.)

The Chat Generative Pre-Trained Transformer: the ChatGPT is GenAI technology that has become extremely popular in every area, including the educational sector. ChatGPT is an advanced machine learning model developed by OpenAI, that can perform Natural Language Processing (NLP)tasks with high accuracy. ChatGPT has the ability to do various types of tasks such as response to prompts, summarize text, creating computer code and creating fictional and non-fictional contents. ChatGPT can answer follow up questions, refuse false assumptions, admit mistakes, and reject unsuitable requests, due to its ability to retain data from previous discussions. ChatGPT has made a big evolution in the technology sector. There are several reasons why ChatGPT is becoming more and more popular. It shows a rich knowledge base, removing the limits of machine learning, and providing an effective and flexible text- generation model with unlimited possibilities by training on massive amounts of data. Recent breakthroughs of artificial intelligence have increased its accessibility and impact in several fields, although it has been around for a long time. (Bhatia 2023; Chan & Colloton 2024, 11.)

3 ARTIFICIAL INTELLIGENCE IN EDUCATION

Nearly every industry in the world has been impacted by artificial intelligence, and education is no exception. Education is undergoing a major transformation with the introduction of artificial intelligence. Moving away from the traditional, standardized model, one of the most exciting possibilities of AI is personalized learning. (Zohuri 2024.)

The term artificial intelligence in education (AIEd) can refer as the AI technology applications that help to improve education, such as chatbots, robots, intelligent tutoring systems, and automated evaluation of digital learning materials. (Chiu et al. 2022.) AI has huge opportunities to revolutionize traditional teaching and learning methods when it is integrated into the education sector. AI makes it possible to provide personalized education that is customized to each student's particular needs and learning preferences. This personal learning involves more than providing information. It makes an environment where students can interact with studies in a way that speaks to them personally with a deeper understanding and retention. AI has the ability to change several areas of education, such as curriculum development, grading systems, and student assistance, promising improved learning opportunities for all students. (Kumar et al. 2023.)

Though the influence of AI has widespread all around the world, still policy level strategic plans mainly focused on the impact of work and the skills required employment than on education and learning. This also relates to AI ethics, which provide general standards for reliable AI. Niemi et al. (2022, 4) found that only the guidelines and ethical principles of UNESCO have specifically addressed the education sector. (Niemi et al. 2022, 4.)

3.1 AI Tools in Higher Education

Higher Education is facing a dramatic change due to the rapid development of digital technology and changing demands of various students spread across the world. Although there are advantages of traditional teaching methods, they often come up with a gap in providing personalized assistance and quick feedback. AI-powered tools like virtual assistants and other tools provide opportunities to remove the gap between traditional teaching and student's demand. (Sajja et al., 2024.)

The education sector was significantly impacted with the arrival of GenAI models such as ChatGPT, Microsoft Copilot, and Google Gemini. And students have widely adopted these tools to support studying, personalized learning, exam preparation, and assignment completion, because of their outstanding capacity to provide specific details to study. The ability to generate more accurate and detailed responses of these tools has been further improved by recent developments in natural language processing (NLP). These tools can effectively analyse questions and offer up to date responses since they are large language models (LLMs) trained on big datasets. (Salman et al., 2025.)

Microsoft and GitHub partnered to create Copilot, formerly known as Bing chat, which uses an updating GPT model to provide AI-powered code completion by forecasting and proposing code snippets. Google Gemini, formerly known as Bard by Google DeepMind, is a flexible tool for writing, planning, and learning support that combines deep learning with massive language models to provide accurate answers to relevant topic areas. (Salman et al., 2025.)

QuillBot is another widely used AI tool among students of higher education. QuillBot is a Natural Language Processing (NLP) tool. It helps students to write, summarize, and improve their writing skills. Helping users to create superior written content is the principal aim of QuillBot. (Amyatun & Kholis, 2023.)

Grammarly is one of the widely used automated writing evaluation (AWS) tools among many teachers and students these days. According to Qub'a et al. (2024) it is considered as the most accurate grammar checker in the world. (Qub'a et al.,

2024.) Not only Grammarly, but also Google Translate and Wordtune are well-known AI-powered writing tools that assist students to improve their writing, paraphrasing, grammar, and cognitive skills. (Zawacki-Richter et al., 2019.)

Text-to-Speech (TTS) is a technology that computer programs can generate speech that sounds natural from written material. This was introduced in the 1960s and can be found widely through various applications. Microsoft's Natural Reader, Speechify, Speak Selection, Screen Reader, Text Reader, Voice Dream Reader, Google's SpeakIt are best examples for Text-to-Speech technology. TTS applications are founded as important educational tools, since they greatly benefit students with learning difficulties, visual impairments. Not only that, professionals and students can utilize this for multiple cases. (Fitria, 2022.)

In addition to text-based assistance, AI-powered image generation tools have become advanced resources in higher education. These generative text-to -image models allow students to generate beautiful authentic images simply by inputting a prompt, a short piece of descriptive text. They use a decoder, mostly based on diffusion techniques, to produce accompanying images and an encoder to understand the prompt, all built on models trained with huge datasets of image-text pairs. Popularly used models are DALL-E, MidJourney, and Stable Diffusion. (Klug & Pietsch, 2024.)

AI tools are discussed in this chapter are few popular and widely used applications among students in higher education. However, students are using several other AI tools for their academic work, such as AI-powered research assistants, automated feedback systems, and personalized learning platforms.

3.2 Benefits and Risks of AI

Artificial intelligence provides several advantages in higher education. However, there are risks related to using AI tools in academic work as well. This chapter finds about benefits and risks of using AI tools in academic work by reviewing existing literature.

Artificial intelligence provides possibilities to assist schools and teachers by removing the gap between learning and teaching. It can increase productivity, tailor learning to individual students, and automate administrative work, freeing up teachers' time. This allows them to focus on gaining knowledge and flexibility, that are specific to humans and lacking in machines. AI provides a level of personalized learning, which is currently unattainable for teachers who manage large classes of students. (Akinwalere & Ivanov 2022.)

University Canada West (2024) found that, there are various advantages in using artificial intelligence in education. They include personalized learning by adaptive technologies specifically designed to each student's needs, immersive learning experiences by virtual and augmented AI technologies, and increases student engagement through game-based platforms. In addition, AI provides real-time data to enable ongoing teaching strategy improvements and automates administrative tasks, making education more affordable and flexible. However, the article mentioned the disadvantages, such as data privacy problems due to its requirements of personal data, as well as ethical issues like algorithmic bias and dehumanized learning experiences due to a lack of human touch. These limitations emphasize the importance of applying AI with caution so that it improves learning while keeping human elements core to education and protecting students' rights. (University Canada West 2024.)

According to (Chan & Hu 2023), the incorporation of GenAI tools like ChatGPT in universities has both significant challenges and positive advantages. However, Students find GenAI to be a highly useful tool with numerous advantages, such as personalized learning and immediate assistance, writing and idea generation assistance, research and analysis assistance, multimedia content creation assistance, and administrative task simplification. Efficiency, accessibility, and independent learning can all be improved by these tools. Furthermore, students expressed their major concerns, including the validity and transparency of AI output, data privacy risks, academic integrity issues like plagiarism, and over-reliance that can affect critical thinking, creativity and overall skill development. Other concerns include the impact on human values and career opportunities, and the lack of clear institutional policies governing the use of AI. These findings

refer to the necessity of AI ethical use in academia to balance innovation and integrity. (Chan & Hu 2023.)

Baidoo-Anu and Ansah (2023) looked back on the benefits and drawbacks of AI tool use, specifically ChatGPT within higher education. The use of AI in higher education has many advantages, such as facilitating language translation to improve access, making essays marking easier to reduce teachers' workload, improving personalized and adaptive learning by matching each student's needs, providing interactive and conversational learning experience, and creating instructions for formative tests. There are downsides to using AI as well, however, like no human touch for best learning, no in-depth conceptualization, persistence of bias in training data, problems with originality and creativity, dependence on the quality and relevance of the training data, a lack of contextual understanding, limited personalization beyond general facts, and privacy and security concerns. (Baidoo-Anu & Ansah 2023.)

3.3 Ethical Implications of AI

Despite the advantages and disadvantages of implementing AI tools in higher education discussed in the previous section, it is also important to address the significant ethical challenges raised by their usage. The use of AI in universities involves significant concerns about data ownership, student autonomy, justice, and maintaining academic values alongside technical viability and practical outcomes. Ethical problems arise not only from the possible misuse but also from systematic issues, such as algorithmic bias, lack of transparency, and unequal opportunities to use AI based solutions. A serious consideration of ethical implications is therefore necessary to make sure that AI-based innovations reinforce rather than compromise the basic principles of higher education. (Niemi et al. 2022,267,284-285.)

Slimi and Carballido (2023), present ethical challenges regarding AI application in higher education through an analysis of seven global AI ethical policies. Their main ethical concerns are the potential for bias and discrimination in AI systems,

which might unintentionally reproduce social injustices. There is a growing risk that when AI tools are incorporated within educational environments, they will reinforce inherent biases, influencing students' learning processes and results along socioeconomic status, gender and race. The authors believe that to avoid these biases, AI systems need to be properly designed, tested, and continuously monitored so that they are fair and equal to every student. (Slimi & Carballido 2023.)

Institutions must consider the various ethical concerns of artificial intelligence into higher education. According to Aprianto et al. (2024), AI raises critical problems on data privacy, algorithmic fairness, and the transparency of AI decision making process while AI has huge potential for administrative efficiency and tailored learning. Relies on AI systems at the risk of underestimating human judgement, especially in the absence of considerations of ethical questions in the development and implementation of these systems. Existing gaps in educational settings may be worse by problems like biased algorithms, unequal access to AI tools, and the transparency of automated decision making. However, building trust, protecting student's rights, and making sure AI technologies support rather than weakening the values of higher education all depend on a balance between the need for innovation and a strong ethical framework. (Aprianto et al., 2024.)

Niemi et al. (2022) found that, using AI in the education brings various ethical problems by their recent research from Finnish schools. Their qualitative study with school principals and online teachers expressed worries about teachers' limited understanding about AI technologies and their ethical consequences. As well as teachers expressed fears that growing reliance on AI tools could reduce students' independence in the classroom and give companies more power to decide on curriculum and other matters. Data privacy, clarity of AI systems, and information security were identified as the main problems, especially when students' data is gathered, stored, or shared without clear guidelines. Furthermore, there were concerns about unequal access to digital resources because not all schools have the facilities to provide AI-based education. Even though most people have positive attitudes toward technology, teachers preferred AI tools that are transparent, ethical, easy to use, and with educational

values. Additionally, they promoted strict laws to control the ethical use of AI tools in education, highlighting that ethical supervision should be carried out at the government level rather than only in schools. (Niemi et al. 2022, 289-291.)

3.4 Current AI Guidelines at OAMK

AI guideline use at Oulu University of Applied Science (OAMK) is in accordance with Arene's recommendations. Arene, the Rector's Conference of Finnish Universities of Applied Sciences is a representative of all 24 Finnish universities of applied sciences and their rectors. The main purpose of Arene is to promote professional and educational development by influencing laws for increased innovation, work-life balance, and international collaboration. The organization sets strong emphasis on ethical and transparent practices, with a view to assisting universities in developing students who are prepared to take real-world challenges and become active contributors to society. Arene has created guidelines for the implementation of AI in higher education institutions in accordance with these objectives. The guidelines encourage institutions to implement AI in both teaching and administration. Even though Arene provides a structure, universities can adapt to align with their policies. (Arene 2024.)

OAMK advises students to use generative AI responsibly to support their learning and obtain practical knowledge with tools that are becoming popular in modern business. However, OAMK also highlights that academic responsibility, critical thinking, and source evaluation are still important elements of higher education. Students are reminded that although AI can support learning but never replace the complex cognitive abilities that lead to success in both studies and a career. Students can utilize AI tools to support their personal study activities, including exams preparation, idea creation, studying individual topics, time management, and information searching. Teachers apply "traffic light model" to guide the usage of AI indicating whether it is permitted, restricted or prohibited at the beginning of each course. Although students are advised to carefully investigate AI, they should critically analyze AI-generated content as it may be biased or inaccurate.

In general, AI can be used for scholarly work assignments but should be revealed by students on instructions from the teacher. AI may help with many academic activities but should not create whole assignments, and its role can affect grades on tests. Maintaining academic integrity requires transparency and ethical use. (Oulu University of Applied Sciences (Oamk), n.d.)

Students can utilize their institutional credentials to access Google Gemini and Microsoft Copilot through OAMK without any additional charge. Lecturers can instruct students to implement AI for some specific courses. However, students remain fully responsible for the accuracy and credibility of their work. Additionally, Students are required to adhere to OAMK's privacy policy and data protection regulations when using AI technologies. Students must not share sensitive and personal details when using AI and institutional credentials should be used for secure access. Students must be aware that different universities have different AI policies, even though OAMK's guidelines are in accordance with Arene' general guidelines. (Oulu University of Applied Sciences (Oamk), n.d.)

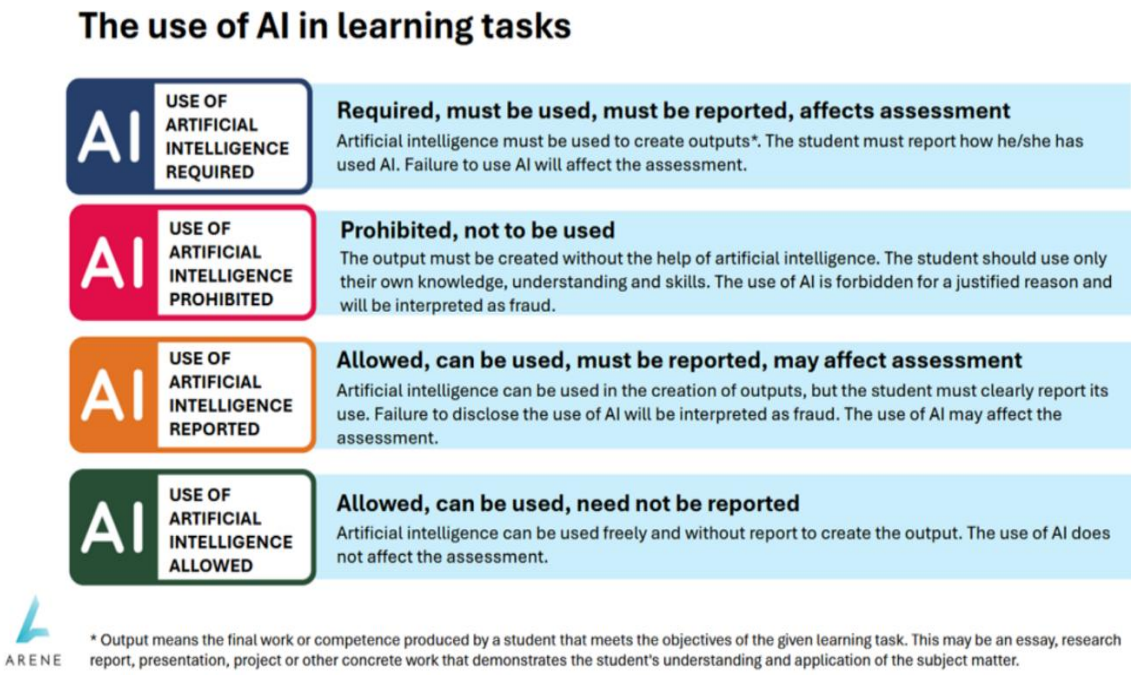

FIGURE 2. The Traffic Light Model created by Arene (Adapted from Arene 2024)

3.5 Conclusion

In conclusion, previous literature has pointed to the increased use of AI tools in higher education with both benefits and risks with concern of efficiency, academic integrity, and ethics. Institutions around the world are developing policies for AI use, such as the traffic light model of Arene is used by OAMK to help students manage their AI use responsibly. General guidelines for the use of AI in education have been developed, however, few research has been conducted specifically on how OAMK degree students' beliefs, perceptions, use and ethical considerations of using AI tools into their academic work. This thesis attempts to fill this knowledge gap by exploring the current practices and attitudes stated by degree students, as this contributes to their better understanding of how AI tools influence their academic learning in the OAMK.

4 METHODOLOGY

This chapter explain the research approach, data collection method, data analysis, and the processes used to conduct the research for this thesis. This thesis used a case study approach since it provides in depth understanding about the current situation, as well as to provide suggestions for development of current AI guidelines at OAMK (Moilanen et al. 2022, 69). Furthermore, mixed-method approach is used to examine the impact of AI tools in higher education at Oulu University of Applied Sciences.

The mixed-method approach originally came from the “triangulation of methods” movement. Triangulation means the using both quantitative and qualitative approaches to verify research findings. Triangulation focuses on the reliability of data and mixed-method approach goes beyond that. It helps to confirm findings as well as give a deep understanding about the topic. Furthermore, it helps to provide new ideas. (Dunning et al. 2007.)

Mixed- method approach was selected as the research design, based on the nature of the research questions; How do AI tools currently used by students at OAMK? How do students at OAMK view the use of AI tools in their academic learning? What are the ethical considerations for student's learning activities when using AI tools in academic works? Quantitative data collection was used to know current usage of AI and student’s perceptions, as well as to get a deeper understanding semi-structured interviews were conducted. That was helped to get an overall picture of students’ usage of AI tools, their personal views, and the ethical considerations of applying AI tools to academic learning.

4.1 The case study organization - OAMK

The case study company of this thesis is Oulu University of Applied Sciences (OAMK), one of the best universities of applied sciences. OAMK provides bachelor’s and master’s degrees, open university education, and a wide range of specialization and continuing education programs. Information technology,

culture, business, natural resources, social and health care, and technology are some of the fields that students can study from OAMK. Furthermore, OAMK provides vocational teacher education that allows students to qualify as vocational teachers, study counsellors, or special needs teachers. OAMK plays an important role in developing and renewing of the Oulu region and Northern Finland by playing an active role in research, development, and innovation (RDI) activities in addition to teaching. (Oulu University of Applied Sciences (OAMK), n.d.)

The university collaborates with around 200 universities in more than 30 countries in the area of internationalization, entrepreneurship, and business renewal. As shown by its quality seal from the National Centre for Educational Evaluation, which is valid until June 2030, OAMK's operations are driven by its strong commitment to sustainable development and quality management. OAMK is operating under the Finnish Universities of Applied Sciences Act, the institution makes sure that its procedures meet both national and European standards for higher education quality. (Oulu University of Applied Sciences (OAMK), n.d.)

4.2 Data collection methods

4.2.1 Survey

To collect empirical data for this thesis, a survey was designed and distributed among degree students at OAMK from various fields of study, including business, culture and arts, engineering, information technology and social and healthcare. Webropol online analysis and survey tool used to conduct the survey. It consisted of both closed-ended and open- ended questions in order to gather responses from large population. The questionnaire aimed to identify students AI usage, their thoughts of benefits and risks, and their views on the ethical and pedagogical implications of using AI tools in higher education.

The survey consisted of a total of fourteen questions. The questionnaire was carefully designed with simple and easy to understand questions that all participants could complete quickly. It was included eleven closed-ended

questions with multiple choice items, yes/no questions, and check-list style questions. As well as one Likert scale question ranging from “1- not helpful at all” to “5- very helpful” to rank the helpfulness of AI tools for academic work. Furthermore, there were two open-ended questions to gather details about suggestions for how AI use should be regulated by the OAMK and benefits of using AI tools.

A public link to the survey was created and distributed to all degree students at OAMK via the university’s official email system Microsoft Outlook. The recipients email addresses were added in the Blind Carbon Copy field to ensure the security and privacy of all participants. All participants were informed about the purpose of the study and provided an informed consent before completing the survey. Furthermore, research permit has been granted from the university prior to the survey. The responses were anonymous, and participation was entirely voluntary. The survey was carried out between 22nd April and 27th April 2025.

4.2.2 Semi-structured interviews

In qualitative research, interviews are the most widely used data collection method, and the semi-structured format is the most popular interview approach. The reason for this popularity is it have been identified as both flexible and reliable format. The main advantages of semi-structured interview format is two-way communication between the interviewer and the participants. Furthermore, interviewer can ask follow-up questions and get a deep understanding of the topic. (Kallio et al. 2016.) In this thesis, Semi-structured interviews were conducted in addition to the survey to get a deeper understanding of student’s experiences and insights into the use of AI tools in academic work.

Five Degree students were selected for the interviews. Participants were chosen voluntarily in order to include students from various fields of study. The following table provides the background information of the interviewees.

TABLE 1. The background information of the interviewees.

Interviewee	Program of Study	Year of Study	Student Type
1	Bachelor of International Business	3rd Year	Local
2	Bachelor of International Business	3rd Year	International
3	Bachelor of International Business	2nd Year	Local
4	Bachelor of Information Technology	2nd Year	International
5	Bachelor of Healthcare, Nursing	2nd Year	International

Although an attempt was made to choose participants from various fields of study, the final group was mostly consisted of Business field due to schedule availability and voluntary participation. The purpose of the study, voluntary participation, and the use of interview data were explained before each interview. Furthermore, informed about interview recording and data privacy through the university email system to all interviewees. No personal details gathered during the interview and verbal consent were obtained. All interviews were conducted anonymously to protect participant's privacy and transparency.

Four interviews were conducted via Microsoft Teams, and one was conducted through WhatsApp call to fit the participant's schedule. Interviews were conducted between 28th April and 7th May 2025. All interviews were conducted in English and lasted around 20 – 25 minutes. All interview sessions were video recorded with the permission of the participants. Then transcribed them to support and simplify the data analysis process.

The interview format was created in a flexible and simple manner. The interview questions focused on AI usage, teacher guidance, benefits and risks of using AI in academic work, learning effects, and ethical concerns. Participants freely shared their ideas and experiences. Furthermore, a few follow-up questions were asked during the discussion. The interview questions guide is available in the appendix section.

4.3 Data analysis

4.3.1 Analysis of survey results

A total of 324 students from various fields of study completed the survey. However, not every participant answered every question on the questionnaire. This is a common problem in an online survey that are voluntary. According to the recent research, when online survey includes open-ended questions, many respondents either skip or stop filling the survey (Hadler 2023). There were fewer answers for open-ended questions. 168 students answered to the question “In what ways do AI tools benefit their learning” and 144 students only answered to the question about “how should OAMK regulate AI use in academic work”. Gathered data was analysed using descriptive analysis. However, thematic analysis used to examine open-ended question’s answers and used Braun and Clarke (2006) six stages process.

Demographic information

Participants in this survey were students from Business, Culture and Arts, Engineering, Information Technology, and Social and Healthcare faculties. There were (24.4%, n=79) Business students, (4.0%, n=13) Culture and Arts students, (28.4%, n=92) Engineering students, (24.1%, n=78) Information Technology students, and (19.1%, n=62) Social & Healthcare students. The majority of respondents are from Engineering, followed by Business and Information technology fields. According to the year of study, the most were (31.8%, n=103) second year students, followed by (27.8% n=90) first year students. Table 2 shows demographic information.

The highest number of responses have received from 1st Year Engineering students, and Lowest responses have received from the Culture and Arts students. This highlights the strong representation from the technical side and that may affect how they see and use AI tools in their studies.

TABLE 2. The distribution of respondents by fields and year of study.

Field of Study	1st Year	2nd Year	3rd Year	4th +	Total
Business	13	28	26	12	**79**
Culture & Arts	4	1	2	6	**13**
Engineering	32	25	18	17	**92**
Information Technology	24	26	18	10	**78**
Social & Healthcare	17	23	20	2	**62**
Total	**90**	**103**	**84**	**47**	**324**

Current use of AI tools by students

According to the survey results, many students at OAMK have utilized AI tools for their academic work. 321 respondents were answered the question “have you used AI tools for academic purposes”. However, out of 321 respondents, (89.7%, n=288) reported using AI tools and only (10.3%, n=33) reported for not using AI tools. This highlights that AI tools have already impacted on students learning experience at OAMK.

The next question was about which AI tools used the most. This was a multiple-choice question. There were 295 respondents and a total of 496 selections were recorded. As seen in Figure 3 below, (89.5%) ChatGPT is the most widely used AI tools among students. And (37.6%) CoPilot, (14.6%) other tools, and (12.5%) Gemini hold other places. Less selected tools were (10.2%) Grammarly and (3.7%) QuillBOT. This highlights that, ChatGPT gained this popularity due to its ability to quick text generation and answering questions. The total percentage value exceeded 100% because this was a multiple-choice question. Therefore, participants selected more than one AI tool.

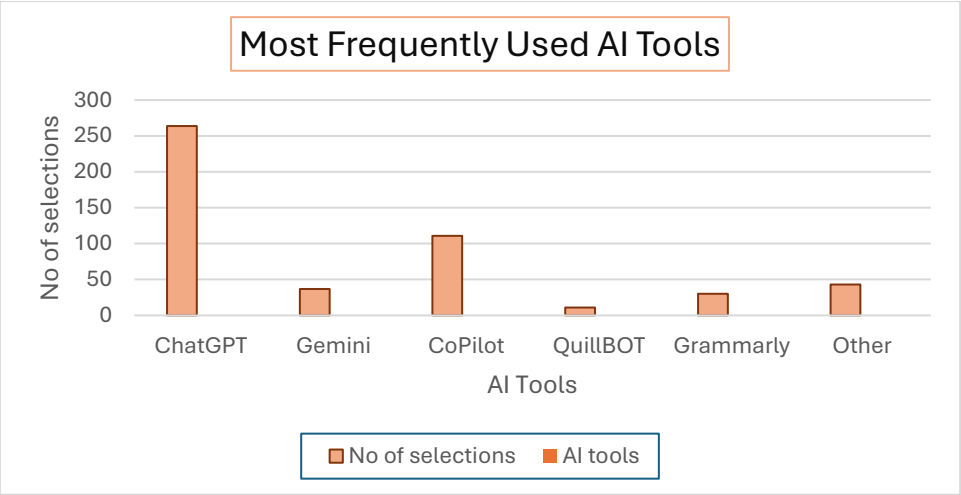

FIGURE 3.Most frequently used AI Tools among degree students. (Multiple Responses, n=295 respondents, 496 selections)

The results for the question "how frequently use AI tools in their studies" are illustrated in figure 4. Out of 321 respondents reported as (17.4%, n=56) daily use, (28.7%, n=92) weekly use, and occasional use by (44.9%, n=144). Only (9.0%, n=29) reported never using. Again, these results highlight how many students have already integrated AI tools for their regular academic work.

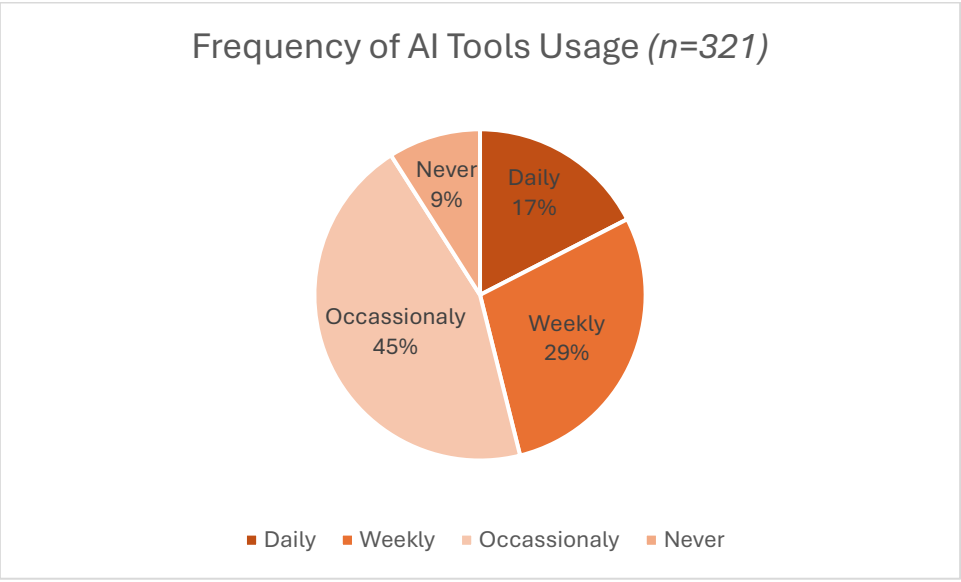

FIGURE 4. Frequency of AI tools usage among degree students. (n=321)

The data presented in figure 5 highlights academic tasks for which student use AI tools. Out of 305 students, the majority (35.1%, n=107) reported that they use AI for research assistant, while (17.4%, n= 53) reported that they use AI for every academic tasks. Other tasks included (15.7%, n=48) language translation, (14.8%, n=45) summary text, and (8.2%, n=25) writing essays. (8.8%, n=27) student group reported that they use AI tools other than these tasks. These results highlight that students are mainly use AI tools for information gathering, analysis, or for knowledge base. Furthermore, some group of students use AI for several works and this highlights that there is a considerable group that heavily rely on AI for their academic work.

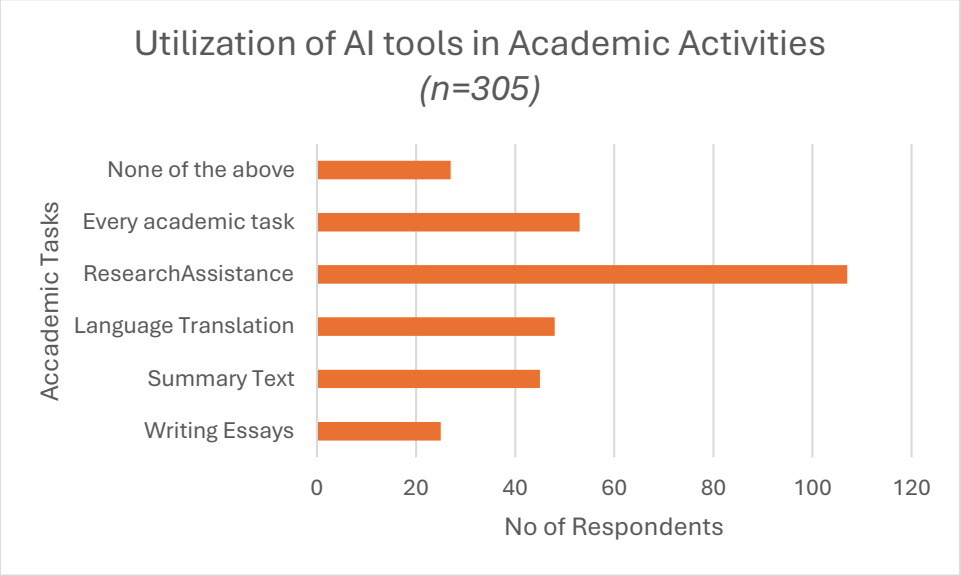

FIGURE 5.Utilization of AI tools in academic activities among degree students. (n=305)

Student's view using AI tools in learning

Several questions were included in the survey, to explore the student's views on using AI tools in learning and its impact. There were three questions asking about AI tools helpfulness, learning enhancement, and critical thinking. The question about AI tools helpfulness was a Likert scale question, which was ranging from 1= not helpful at all to 5=very helpful. As illustrated in Table 3, Mean score is 3.84 and Standard Deviation is 1.02. This highlights that students consider AI tool as helpful. According to the Standard deviation, the majority of responses were

centred around the average. Only few students have reported as not helpful at all.

TABLE 3. AI tools helpfulness for academic work.

Option	Scale	Frequency	Percentage
Not helpful at all	1	11	3.50%
Not helpful	2	15	4.70%
Neutral	3	83	26.20%
Helpful	4	112	35.30%
Very helpful	5	96	30.30%
Total		317	100.00%
Mean			3.84
Standard Deviation			1.02

Furthermore, the survey included a question about whether AI tools improve students learning experience. 319 responses were received and out of that, (56.4%, n=180) reported as "*yes*" and (9.7%, n=31) reported as *"No".* while (33.9%, n=108) students answered as *"Neutral".* Based on this result, that majority of students believed that AI tools improve their learning. However, it is important to consider about the "Neutral" answer's percentage. This highlights that some students are still not sure about how AI tools can affect their learning though they use.

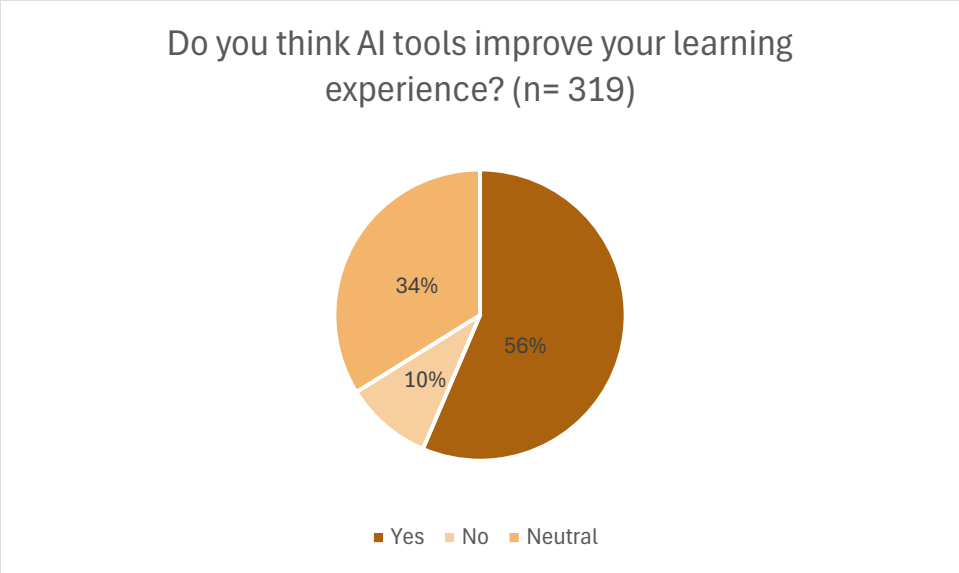

FIGURE 6. Responses on whether AI tools improve learning. (n=319)

Students also responded to whether using AI tools affects their critical thinking skills. Out of 320 respondents, (36.9%, n= 118) reported yes, while (30.6%, n=98) reported no. In addition to that, (32.5%, n=104) reported as neutral. Based on these results, it is quite difficult to get a clear picture of the matter. Since students have different opinions about AI affects critical thinking. However, the neutral percentage highlights that many students are unsure about how AI affects their critical thinking and not have a clear idea about its impact.

Ethical considerations for using AI tools in academic work

Another important factor explored in the survey is the ethical considerations for AI tools in academic work. When asked about the ethical considerations for using AI tools in their academic work 323 students answered in a various manner. Highest responses received that their opinion is “depends” on the situation (68.7%, n=222). While (24.5%, n=79) respondents said it was ethical and (6.8%, n=22) said it was not. This survey results highlighted that most students do not think that using AI for their academic work is always right or wrong. They believe it depends on how they use it.

The following question explored students concerns about AI in academic work. This was a multiple-choice question. There were 320 respondents with 799 answers. As illustrated in Figure 7, the most concerns was the lack of critical thinking (70.6%, n=226), then over reliance (63.1%, n=202), plagiarism risk (58.8%, n=188), bias in responses (53.4%, n=171), and a small group of students have reported as no concerns (3.8%, n=12). This result highlights that while students find AI as a helpful and beneficial tool, they are also aware about the possible risks which effect their academic and ethical integrity. The total value exceeded 100% due to multiple selections.

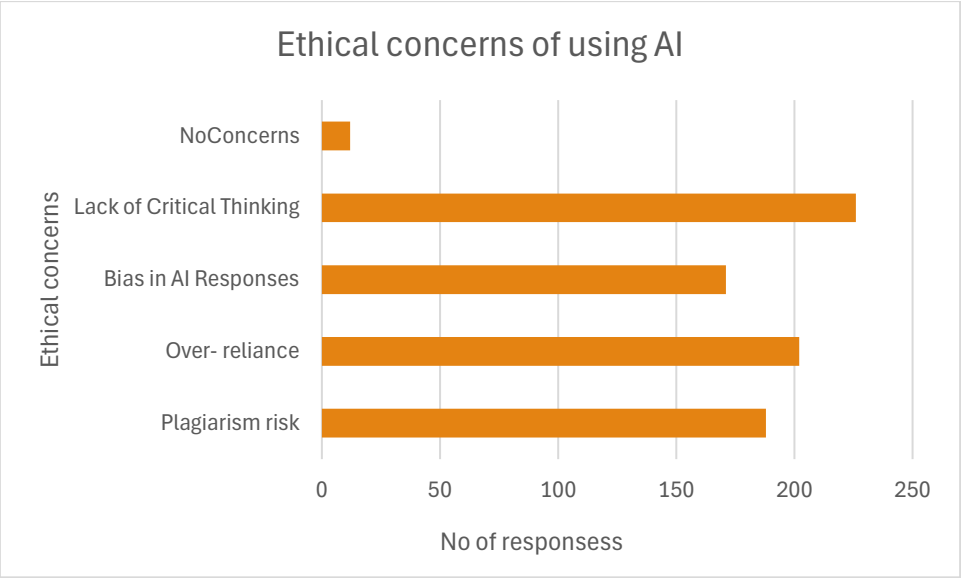

FIGURE 7.The most common ethical concerns of using AI tools in academic work. (Multiple Responses, n=320 respondents, 799 responses)

Benefits of AI tools

A total of 168 students responded to the open -ended question, “in what aways AI tools benefit your learning”. Response PDF downloaded as a word document from Webropol and printed out which consisted of 10 pages. Important key sentences and words about benefits of AI said by students were highlighted using a highlighter pen to analysis data. Then highlighted sentences and words were grouped based on their main ideas. Similar ideas from different responses were added into the same column in a table. For example, the responses *“It helps me find information faster”, “AI tools help me find relevant sources”* were added to a same column, while responses like *“It helps me understand codes better”, “ChatGPT make it simpler to understand”* were added into a same column.

This method helped to group repeated patterns together and clearly see in columns. Once all highlighted data added into columns, each one was reviewed to identify an insightful theme based on its main idea. Table 4 illustrated, 12 key benefits of AI tools were developed based on students’ perspective. However, it is important to highlight individual response that provides a unique idea about AI tools benefit. One student specifically highlighted*, “It helps me find answers and helps me keep track of my thoughts, I am ADHD.”* This response highlights how AI can help students with some learning difficulties. Another highlighted factor

was nine students responded that they did not benefit from using AI tools in their learning.

TABLE 4. Identified benefits of using AI tools in higher education from student perception.

Themes	Frequency
Helping understand and explain concepts	41
Finding information and generating ideas	53
personalized learning support	21
24/7 availability and accessibility	8
Summarizing text and information	24
Guidance and inspiration	8
speed and efficiency	31
Language and writing support	35
Identify mistakes	6
Instant feedback	10
Saving time for learning	15
Free learning assistant	2

Students' suggestions on OAMK AI regulations in academic work

144 responses were received to the question "How should OAMK regulate AI use in academic work". The response PDF was downloaded and printed out. There were 10 pages and important key sentences and words were highlighted manually to identify recurring ideas and patterns. Thematic analysis used with the same coding process, which was used in previous open-ended question. After carefully reading all responses, key sentences and words were highlighted and grouped them into columns. Similar ideas from different respondents were added into the same column in an Excel spreadsheet.

Furthermore, each column was reviewed to identify common themes. Those identified themes were then added as column headings of Excel table. Each theme represents a pattern which were found through student's responses. This process helped to get good insights into student's suggestions and avoid repeat patterns. As illustrated in Table 5, this analysis was developed ten suggestions regarding the AI regulations at OAMK based on student's perceptions.

Various kinds of answers were founded within 144 respondents. Ten main suggestions were developed through specific student's ideas. There were 7 responses as "*I do not know",* indicating that some students were not sure, while 16 responses did not provide any concrete suggestions about AI regulations. Among those responses, a small portion responded as *"yes*", highlighting that they simply agree on AI regulations. Furthermore, some students have written about their ideas on using AI but could not find any hidden ideas from it. However, few students have mentioned that it is the student's responsibility to use AI correctly.

TABLE 5. Main suggestions identified about AI regulations at OAMK on students' perception.

Themes	Frequency
AI regulations based on subjects and tasks	20
Need clear guidelines on using AI	30
Need strict AI policies	1
Totally prohibit AI use	8
AI use without strict regulation	16
Declaration of AI use by students	5
Current regulations are enough	14
Mandatory training on AI using	20
AI use guidance by teachers	9
Re-design teaching & assessment styles	30

4.3.2 Analysis of interview results

The five semi-structured interviews were analysed according to Naeem et al. (2023) thematic analysis framework. It provides a step-by-step approach for exploring qualitative data. This method was chosen to analyze interview results due to its clear analysis structure which helped to get a better understanding of interviewee's experience and perceptions about using AI tools in academic work. This analysis process has six stages.

First, all interviews' transcripts were downloaded from Microsoft Teams. Then, carefully read the transcripts and important key sentences were highlighted. After highlighting all transcripts, there were 78 statements. A table was created in Excel

with column heads for Interviewee Id, Highlighted statements, key words, codes, and themes. Each participant was assigned an “interviewee ID” based on the first letter of their name. This helped to identify individual responses clearly and to maintain confidentiality. Added all highlighted statements into the column and categorized them into key words derived from them. Then the researcher tried to find connections and elements to research questions. After analyzing key words, converted them into insightful manageable units and added them under “code” column. Patterns and insights were identified which is aligned with research questions. Based on keywords and code, themes were developed for each statement.

To identify patterns and themes, the data was arranged using Excel sorting function. All themes were arranged in alphabetical order. It helped to identify similar codes and themes clearly. Furthermore, color codes were added to the same themes using conditional formatting for more easy references. The identified themes were again checked with statements to make sure that they properly reflect the students’ comments. Finally, six key themes were developed based on interview data. The identified themes are AI tools in higher education, AI usage among students, benefits of AI, concerns of AI in higher education, use of AI in academic work, and Suggestions for OAMK. Table 6 illustrates how codes and themes were developed based on highlighted statements. Only a sample of data is presented in table 6 due to large amounts of data. And the complete Excel table is saved in the password-protected laptop.

TABLE 6. Sample size of Thematic analysis process of interview data

Interviewee ID	Highlighted Statements	Key words	Codes	Themes
R	Normally I use ChatGPT & Grammarly	ChatGPT, Grammarly	Various AI tools	AI tools in higher education
P	I think quite often I use AI	often, use, AI	regular use of AI	AI usage among students
S	The best part of this is quick access to inform	quick, access, inform	accessibility	Benefits of AI
R	It’s dangerous and risk of plagiarism.	dangerous, plagiarism	plagiarism risk	Concerns of AIED
P	We might then start lacking like critical thinking	lacking, critical thinking	lack of critical thinking	Concerns of AIED
P	a course about AI tools and how to use it	course, AI tools, how to	AI literacy	Suggestions for OAMK
H	It is forbidden in most courses	forbidden, courses	AI use restrictions	use of AI in academic work
N	we have been told to use it responsibly	use, responsibly, AI	awareness &guidelines	use of AI in academic work

AI tools in higher education

The first theme developed from the interview data is “AI tools in higher education”. Participants were mentioned about various AI tools that they are using to support their learning. They were highlighted AI tools with their specific abilities. One student responded that, *“Mainly I am using ChatGPT because it is great for explaining concepts, it helps me with my writing and for studies”.* Another participant mentioned that their use of CoPilot for code illustration support. This suggest that students from technical fields are using AI tools which are specifically made for coding and programming. Beyond these AI tools, other AI - powered tools were mentioned during the interviews. This highlights that students are using various types of AI tools to support their learning, depending on their needs, work, and field of study.

AI usage among students

The second theme developed from the interview data is “AI usage among students”. According to the interview data, students use AI tools quite often in their academic work. All most all participants reported as daily users. One student mentioned that *“Pretty often, to be honest, almost every day, whether it’s for coding help”.* Furthermore, another student mentioned *that “Actually, AI tools have become a part of my routine”.* These statements indicate that high reliance of AI as well as its specific task solving ability. Also, another student mentioned that *“Almost daily, especially when I am doing assignments, preparing for exams, or sometimes I want to review my course materials”.* This statement highlights that how AI can incorporate into different academic work. Overall, these statements strongly suggest that AI tools are becoming regular and heavily use on academic work among students at OAMK.

Benefits of AI

The third theme developed was “Benefits of AI”. The interview data revealed key eight benefits of using AI tools in academic work. Most participants were mentioned about the “Personalized learning support”, students mentioned *that “AI can tailor the learning methods to my style”*, and *“Helps students find a personalized way of learning”.* “Efficiency and productivity” is the other benefit

highlighted frequently, with students mentioned that *"AI make my work easier and more efficient"* and *"when I am stuck, it is faster to get a hint or suggestions from AI tools than searching through tons of articles or books".* Next benefit is "Generating Ideas", one student mentioned that *"I have utilized AI in brainstorming different ideas",* while another student mentioned that *"I take some ideas from AI for assignment writing".*

Furthermore, students highlighted about the help of AI to "Understand and explain concepts". One student mentioned that *"I mainly use ChatGPT to help me understand complex topics like pathophysiology and pharmacology like that",* while another student mentioned that *"concept you don't know anything about you can then ask AI to help you understand it better and explain in more detail*". "Language and writing support" was another benefit found. Students were responded that, *"I use AI to formulate like my own writing so improve the writing"* and *"To help in some of the assignments and like for the grammar".*

Furthermore, few students mentioned about the "Summarizing Text" benefits. One student stated that *"It helps make large amounts of material more manageable",* while another student stated that *"I can easily summarize it".* Finally, the responses from a few students indicated that "Accessibility" and "Skill development" as benefits.

Concerns of AI in higher education

The fourth theme developed though interview data is "Concerns of AI in higher education". Students expressed several concerns regarding the use of AI, mainly highlighted about the "Over reliance" and its effect to learning and cognitive skills. Students stated that *"You are not going to learn anything if you are going to use AI tools to do your work for you",* and *"Friends are only using AI like full copy pasting in group work, it makes me feel very annoyed and frustrated".* Majority of participants were highlighted about their concern for "Lack of critical thinking". Students mentioned that *"If you always use AI, you start to forget how to do things for yourself and how does the thinking process work", and "We might then start lacking critical thinking".*

Furthermore, students expressed their concern about “Plagiarism risk”. One student stated that “It is dangerous and risk of plagiarism” while another said, “*AI generated content without understanding it and that can affect real learning and to lead to plagiarism”.* One student indicated that “AI make things a bit too easy” by highlighting “Over-easiness”. Furthermore, another student responded that “So I feel like it has maybe slowed down my learning a little bit, which is not good” highlighting “Slowing down the learning process”. Also, a students expressed his concern about “No creativity” as well.

Use of AI in academic work

The fifth theme was “Use of AI in academic work”. Various viewpoints were revealed under this theme such as, teacher guidance regarding use AI, awareness about AI guidelines, AI use restrictions among subjects, and use of AI depending on the work. Based on interview data identified that some teachers have moderate opinion using AI. Students stated about this *“A few teachers are ok with it as long as we are using it a smart way”* and *“yes we have been told to use it responsibly because it is ok to use AI as a tool”.* This highlights that teachers accepted AI if it is use as a learning support and used thoughtfully. However, students also mentioned that *“some other teachers are a bit more cautious and remind us not to over rely on AI, especially for important assignments”.* This highlights the teachers concern about over reliance and awareness about it to students.

Furthermore, students were stated that *“In exams I think probably it’s not fair”,* and *“AI should not be allowed in exams, exams meant to test individual knowledge”*, while some student stated that *“For assignments it can be fine if students are learning from it and not cheating”.* These statements revealed that AI use is based on the situation or the subjects. Furthermore, few were highlighted about the total restriction in their subjects stating, *“It is forbidden in most courses”*, “*Use of AI is forbidden in most assignments and all exams”.*

Suggestions for OAMK

The sixth and last theme was identified is “Suggestions for OAMK”. Participants expressed several suggestions to OAMK for using AI in higher education. Majority

of students highlighted that clear guidance of using AI in their learning work. One student stated that *"School could teach us how to use AI more effectively and in a smart way",* while another student mentioned to employ this in curriculum *"maybe even include in it in the curriculum somehow".* Furthermore, one student stated that *"A course about AI tools and how to use it and what are the situations that they really bring benefits to you and what can be like the downsides to using AI tools",* while another student stated that *"some special course about using AI like how to use what to get".* Few students suggested for *"Short workshop or training on how to use AI tools effectively and ethically."* These suggestions highlight the need for official instructions from OAMK regarding using AI in academic work.

Furthermore, need of clear guidelines was highlighted from few students' statements. One student mentioned that *"I don't think ever anybody has ever explained like AI guidelines to us"* while another mentioned that *"I know that they are somewhere in the OAMK website, but I have no idea".* Overall students are asking for strong and clear guidance from OAMK to use AI tools in responsible, ethical and efficient ways and applied them into their learning.

Additional observations

Beyond these six themes developed through interview data, some other useful and meaningful insights were found during an interview with a 3rd year student, though it is not aligned with thesis research questions. One student stated that *"I think first year we weren't really aware of these AI tools, we did everything like just like your own brain and own thinking"* also mentioned *"Then second year we had some assignments where we had to use like ChatGPT to just like test it out"*. This highlights how students have shifted from traditional education to AI learning environment. Furthermore, this shift must mostly after the release of ChatGPT as a free tool by OpenAI in November 2022. It also highlights that ChatGPT has made a big impact on how students started using AI in their academic work.

4.3.3 Ethical considerations

Throughout the survey and interview process ethical considerations were carefully considered. All participants participated voluntary. All participants were informed about the research purpose. No personal data were collected during the survey or interview to protect the participants anonymity and privacy. Interview recordings are stored in a password protected laptop of the researcher. And all recordings and transcripts were deleted after the data analysis process. This thesis followed the ethical guidelines of Oulu University of Applied Sciences.

5 DISCUSSION

5.1 Interpretation of results

This thesis explored how students at Oulu University of Applied Sciences use AI tools, views of students regarding using AI, and ethical considerations. Overall, the results of both the student survey and interview provide good insights into growing use of AI tools in academic learning at OAMK. The survey data highlighted that a considerable number of students are already using AI for various tasks. Furthermore, interviews provided a deeper understanding of “why” they choose AI tools in their learning.

The results also highlight that many students are using AI tools for various academic tasks such as understanding course materials, finding information, writing support, language translation, and research activities. Furthermore, students highlighted the helpfulness of using AI tools in their learning. Saving time, improving the quality of their work, making complex topics more understandable are one of them. Finally, we can understand that AI tools have become an essential part of academic work.

However, the results also highlight the students are aware of the risk side of using AI tools. Many students stated that they worry about relying on AI tools that can reduce their problem-solving skill and critical thinking. Furthermore, they are aware about directly copying paste thing from AI, and bias in AI responses. This highlight about student awareness of AI benefits and its impacts as well as looking for using it responsibly.

Overall, this study indicates that AI is transforming the way students learn. The important factor is that university needs to consider how to control and handle this situation. Most students expressed the need for clear guidelines of AI, training programs, and a compulsory course on how to use AI in a smart and ethical way. The university can make good decisions on how AI should be used in academic work in the future based on the results of this thesis to support students’ while maintaining academic standards.

5.2 Comparison with previous studies

The findings of this thesis are mostly aligned with the existing literature on Artificial Intelligence in higher education. Findings of how traditional education methods shifted to AI learning environment are also highlighted in studies by Sajja et al. (2024) and Salman et al. (2025). Furthermore, the findings about widespread use of AI tools among students are also highlighted in these studies. The findings about benefits and risks of AI aligned with many previous studies, such as Akinwalere & Ivanov (2022), Chan & Hu (2023), Baidoo-Anu & Ansah (2023, and University Canada West (2024). These studies have mentioned how students find AI as a helpful tool with various advantages such as personalized learning, immediate assistance, writing and idea generation assistance, research and analysis assistance and more. Overall, this points out the growing trend of AI as a learning tool among students in higher education.

However, findings about concerns of AI in higher education are supported existing literature. Studies by Niemi et al. (2022), Slimi & Carballido (2023), and Aprianto et al. (2024) documented how the overuse of AI tools affects students' critical thinking abilities. The concerns expressed by interview participants about losing the ability of thinking, plagiarism risk, and directly copy- pasting AI contents challenges are aligned with documented concerns. This indicates the ongoing conflicts in the education system due to the use of AI tools.

Interestingly, this thesis highlighted the students demand for university support. Majority participants from the student survey and interview highlighted the need for clear AI guidelines as well as they suggested for training, a mandatory course about AI. Most of previous studies have focused on student behavior or the need for new policies such as Niemi et al. (2022) and Chan & Hu (2023). This highlights that students are actively seeking guidance and like to learn about using AI responsibly in their academic work.

5.3 Recommendations for OAMK

This chapter provides suggestions for Oulu University of Applied Sciences based on the key findings of this thesis to successfully apply and control the use of Artificial Intelligence in the higher education system. Currently OAMK has guidelines for the use of AI tools in academic work. However, the findings from the student survey and interviews revealed that many students are either unaware of these guidelines or not clear about them, and do not know how to apply those in their studies. Though the Artificial intelligence guidelines are available on the official website of the university, students stated that they have not read them properly and feel uncertain about what is suitable and not suitable depending on their academic work. This highlights the gap in communication, accessibility, and lack of understanding about these guidelines among students, not in the existing guidelines of the university. Furthermore, it is recommended that OAMK focuses on improving the current guidelines to make it more visible, understandable and relevant to students' academic work by increasing their presentation and communication with students.

Furthermore, it is recommended that OAMK could benefit by adopting relevant and important parts from the AI Ecological Policy Framework developed by Professor Cecilia Chan. This framework highlights the importance of ethical awareness and AI education in teaching and learning in higher education. (Chan, 2023.) Furthermore, this framework highlights that universities should effectively communicate, discuss in classrooms and apply into learning with practical examples and training. By adopting this framework OAMK can provide workshops on AI use, include teacher conversations about responsible use of AI, provide clear guidelines about acceptable and unacceptable AI use in academic work. This approach will help students understand current AI guidelines, responsible and ethical use of AI tools that will reduce their uncertainty and confusion currently facing among students.

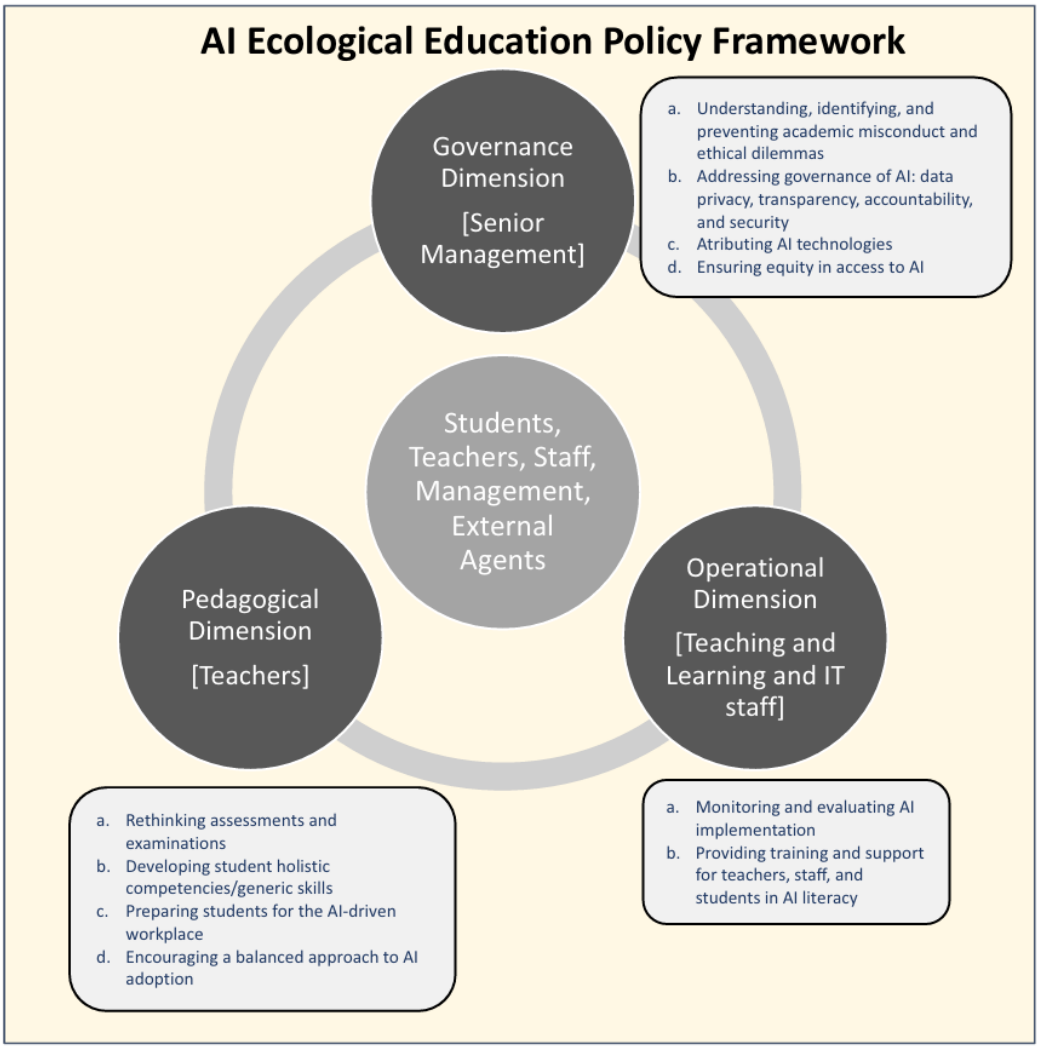

FIGURE 8. AI Ecological Policy Framework (adopted from (Chan, 2023))

6 CONCLUSION

6.1 Summary of key findings

This thesis explored the current usage, perceptions, and ethical considerations of AI tools among degree students at Oulu University of Applied Sciences. The survey was completed by 324 students from various fields of study. The results revealed that majority of students are using AI tools in their academic work. ChatGPT became the most popular AI tool among students. Students reported using AI tools for various academic work such as research assistance, writing support, summarizing text, and language translation. Overall, students believe that AI tools are helpful and beneficial with Mean value of 3.84 on a 5-point scale. Furthermore, they expressed their concerns about over-reliance, plagiarism risk, lack of critical thinking, and bias in AI responses.

The open-ended responses and five semi-structured interviews result further highlighted unawareness or unclearness about current AI guidelines at OAMK. Students expressed the strong need for clear guidelines and AI awareness workshop or a course. Interview results further highlighted AI tool helpfulness, benefits, and concerns of using AI in academic work. Especially highlighted the need for university support regarding AI and ethical awareness. Overall, the findings show that students are expecting university guidance using AI tools in academic work though they are actively using AI tools.

6.2 Strengths and limitations

One strength of this study is a mixed-method approach, which is combined with a survey and semi-structured interviews. That helped to gather quantitative data and qualitative insights with broad understanding of students AI usage, perceptions and ethical considerations in academic work at OAMK. The survey results provided a broad view of students' AI usage and ideas while semi-structured interviews provided deeper understanding to the outcome.

However, this study also has limitations. The survey was conducted only among degree students at OAMK. Furthermore, the survey was voluntary, which means only interested students might have participated. Also, only five degree students were interviewed and most of them are from the Business field of study, which limited the number of opinions gathered in the interviews. Finally, the study focused only on student perspectives and did not include teachers or academic staff. That means results may not present the full picture of AI tool use at Oulu University of Applied Science.

6.3 Future research

Based on the findings and limitations of this study, for future research it would be beneficial to study from teachers' perspectives based on challenges, views, attitudes and university responsibilities. This would deepen and provide a full picture of the topic. Future research could also explore the usefulness of AI workshops and AI education programs. In addition, long term research could be done based on attitudes and behaviour regarding AI tools change over time with the new technologies and policies.

6.4 Self-assessment of the thesis process

The thesis process started in the middle of February 2025, by submitting the thesis proposal. At the beginning, the researcher struggled to find a suitable thesis topic. Several emails were sent to Finnish companies for inquiring to conduct research based on their operations. However, no responses were received, and lecturer Jenni Myllykoski suggested conducting the study within university. After searching for several articles, one article on "current trends in business fields" inspired to develop the current thesis topic.

Once the thesis supervisor was assigned, the initial thesis discussion was held at the end of February. The researcher got the approval to do the thesis on behalf of the Oulu University of Applied Sciences since the topic is novel and relevance. Then an initial discussion with the commissioner was held in the first week of

March 2025. After that, thesis design was created. Thesis design was submitted to the supervisor and the opening seminar was held on 26th of March. Thesis design was approved by the supervisor and few changes were suggested to the thesis topic and research questions.

Then the writing process started. The most difficult part was to manage time, as the researcher worked on the thesis with other courses and examinations. Due to few exams during this period, the direction seminar was not held as planned and postponed to 24th of April. The thesis supervisor was flexible and helped complete the thesis on time. Interestingly, the researcher was able to get a lot of survey responses within a few days. However, the researcher could not find participants from different fields of study for the semi-structured interview as planned.

Overall, the researcher was able to complete successfully with the help and support received from thesis supervisor Yanhong Xi, the commissioner Jenni Myllykoski, and from the peer-reviewer Mohamed Khan. During the thesis process the researcher was able to learn about Artificial Intelligence thoroughly, mostly about its technical side, and its impact on education and students' academic performance. Additionally, the researcher was able to get familiar with various AI tools and their functions, which were previously unknown. Most importantly, the researcher was able to develop time management skills, improve writing skills, work on a study plan, and balance academic work with personal life.

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APPENDICES

Interview Questions:

Q1. Could you briefly describe your field of study and year of study at OAMK?

Q2. Can you tell me what AI tools you use in your studies? In which areas? How often do you use AI tools when doing your homework or assignments?

Q3. Do you think AI tools help you learn better? Why or why not?

Q4. Do your teachers talk about using or not using AI tools in your classes?

Q5. What do you think are the good sides of using AI tools in your studies? What problems do you see when students use AI tools in their schoolwork?

Q6. Do you think using AI affects your own thinking or learning skills? How?

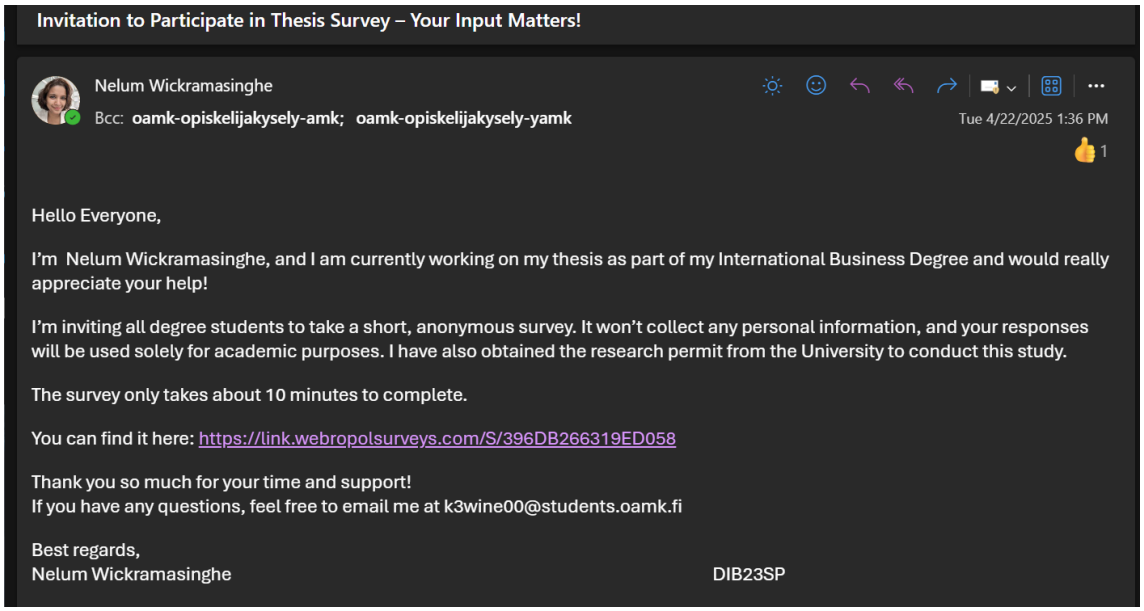
Q7. Do you think it is fair for students to use AI tools in exams or assignments? Why or why not?

Q8. Are you aware of any rules or guidelines about using AI at OAMK? What suggestions do you have for using AI tools in a better way at school?

Survey Questions:

Question	**Response Options**
What is your field of study?	Business/ Culture & Arts/ Engineering/ Information Technology/ Social & Healthcare
What is your year of study?	1st Year/ 2nd Year/ 3rd Year/ 4th +
Have you used AI tools for academic purposes?	Yes/ No
If yes, which AI tools do you use the most?	ChatGPT/ Gemini/ CoPilot/ QuillBot/ Grammarly/ Other
How frequently do you use AI tools in your studies?	Daily/ Weekly/ Occasionally/ Never

For which academic tasks do you use AI tools?	Writing Essays/ Summary Text/ Language Translation/ Research Assistance/ Every Academic Task/ None of the above
How helpful do you find AI tools for academic work?	On a scale 1 – 5 (Scale: 1 = Not helpful at all, 5 = Very helpful) Not helpful at all 1 - 2 - 3 - 4 - 5 Very Helpful
Do you think AI tools improve your learning experience?	Yes/ No/ Not sure
In what ways do you AI tools benefit your learning?	
Do you feel that using AI tools affects your critical thinking skills?	Yes/ No/ Not sure
Do you think using AI tools for academic work is ethical?	Yes/ No/ Depends
What concerns do you have about AI in academic work?	Plagiarism Risk/ Over-reliance/ Bias in AI Responses/ Lack of Critical Thinking/ No Concerns
Have you received guidance from your teachers about AI usage in academic work?	Yes/ No
How should OAMK regulate AI use in academic work?	



Invitation to Participate in Thesis Survey – Your Input Matters!

Nelum Wickramasinghe

Bcc: **oamk-opiskelijakysely-amk; oamk-opiskelijakysely-yamk**

Tue 4/22/2025 1:36 PM

1

Hello Everyone,

I'm Nelum Wickramasinghe, and I am currently working on my thesis as part of my International Business Degree and would really appreciate your help!

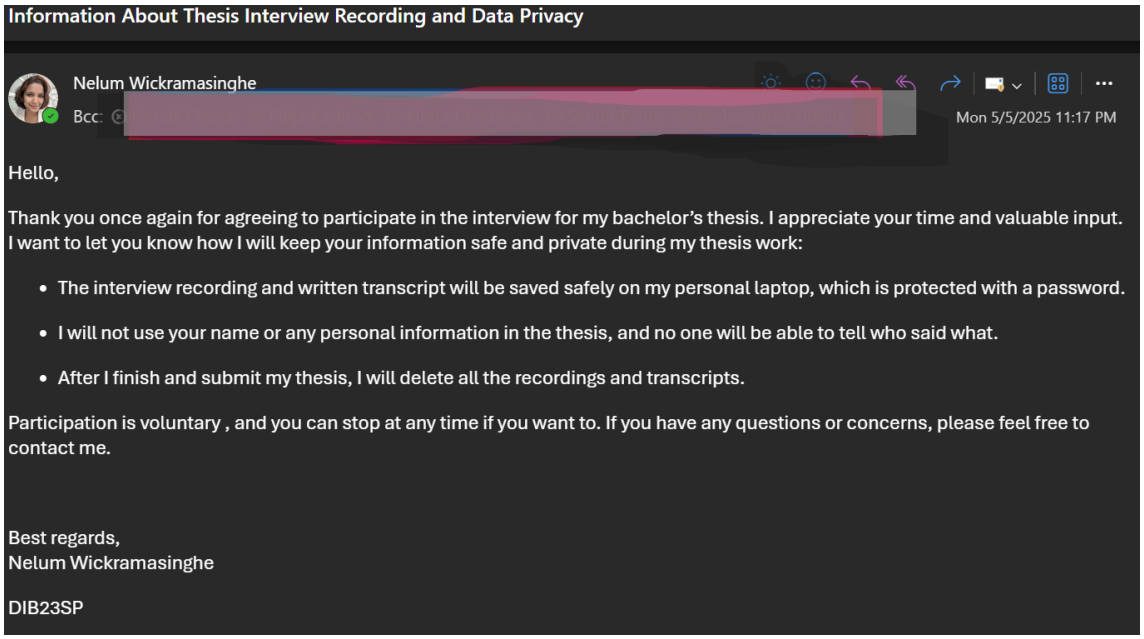
I'm inviting all degree students to take a short, anonymous survey. It won't collect any personal information, and your responses will be used solely for academic purposes. I have also obtained the research permit from the University to conduct this study.

The survey only takes about 10 minutes to complete.

You can find it here: https://link.webropolsurveys.com/S/396DB266319ED058

Thank you so much for your time and support!
If you have any questions, feel free to email me at k3wine00@students.oamk.fi

Best regards,
Nelum Wickramasinghe DIB23SP



Information About Thesis Interview Recording and Data Privacy

Nelum Wickramasinghe

Bcc: [redacted]

Mon 5/5/2025 11:17 PM

Hello,

Thank you once again for agreeing to participate in the interview for my bachelor's thesis. I appreciate your time and valuable input. I want to let you know how I will keep your information safe and private during my thesis work:

- The interview recording and written transcript will be saved safely on my personal laptop, which is protected with a password.
- I will not use your name or any personal information in the thesis, and no one will be able to tell who said what.
- After I finish and submit my thesis, I will delete all the recordings and transcripts.

Participation is voluntary , and you can stop at any time if you want to. If you have any questions or concerns, please feel free to contact me.

Best regards,
Nelum Wickramasinghe

DIB23SP