



Familiarity, Use, and Perception of AI-Powered Tools in Higher Education

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Purpose: AI-powered tools and their use in teaching and learning have grown exponentially. While several studies examine students' use of AI tools for learning, the results are inconclusive. This study aims to understand better students' familiarity with and use of various AI-powered tools for learning and to gain greater insight into students' perspectives on the benefits and risks of using AI-powered tools in educational settings.

Study design/methodology/approach: The study deployed a survey to understand and compare the degree of familiarity and use of AI-powered tools among first and final-year university students. Additionally, several questions focused specifically on students' concerns regarding using AI in their studies.

Findings: Results indicate that first-year students exhibited a higher level of familiarity with AI tools prior to the start of their studies, while final-year students demonstrated a deeper and more diverse usage of these technologies. Despite the concerns raised, the study does not conclusively support the negative impacts on student engagement or developing critical thinking skills. While the study indicated that students are well aware of the general limitations of AI use, they felt they needed to be better supported and informed about how AI-powered tools can be used within their studies. They expressed the need for greater support and guidance from the university.

Originality/value: Research findings have significant implications for educational institutions and policymakers as they strive to leverage AI effectively to enhance the learning experience while addressing concerns and preferences in this rapidly evolving educational environment.

Introduction

Integrating innovative technological tools has always had the potential to enhance learning efficiency and effectiveness significantly (Alavi & Gallupe, 2003). It is, therefore, not surprising that artificial intelligence (AI) and especially generative AI, which can produce novel and distinctive output, has found its way into teaching and learning practices in higher education (Peres et al., 2023; Escotet, 2023). AI-powered tools enable students to write texts, create images, video, and audio, and analyse data. Chen, Zou, Xie, Cheng, and Liu (2022), as well as Hwang, Xie, Wah, and Gašević (2020), found AI to have the potential to improve the student learning experience. Many studies examined the use, perception, and risks of ChatGPT. For example, Imran and Almusharraf (2023) and Chiu (2023) investigated the use of ChatGPT for academic writing, while Huang and Tan (2023) examined its use in research and scientific writing. Several studies investigated the use of ChatGPT in specific business disciplines. McAlister, Alhabash, and Yang (2023) investigated the use and perception of ChatGPT in marketing, while Rane (2023) and Nguyen-Duc et al. (2023) focused on the benefits of using ChatGPT for learning programming. Ellis and Slade (2023) investigated the use of ChatGPT for teaching and learning statistics, and Krause (2023) argued that ChatGPT can be valuable in teaching finance and accounting. Overwhelmingly, evidence shows that students quickly adopted AI-powered tools for writing assignments but found them useful in other areas. Research suggests that students are interested in gaining further knowledge and understanding

of generative AI technology and its application but lack the skills and knowledge to use these tools effectively.

The emergence of AI tools has prompted educators to innovate how they teach (Peres et al., 2023). Still, researchers call for a greater understanding of how AI can be used and how it is perceived by students (Chan & Hu, 2023; Chiu, 2024; Rahman & Watanobe, 2023). Chan and Hu (2023) argue that the benefits of using AI-powered tools are inconclusive, especially in cognitive skills development, motivation, and collaboration. No study analyses AI-powered tools for different tasks in a business degree program. This study aims to close this gap. Thus, the study intends to understand further how and why students use AI-powered tools in their studies. Specifically, we aim to gain greater insights into the students' perspectives on the benefits and risks of AI-powered tools' usage for learning. We also examine if there is any change in the familiarity and use of AI-powered tools and attitudes towards their use among university starters and more senior students. Our research seeks to inform the development of a curriculum so educators can train and support students better in using AI.

The paper is structured as follows. After the literature review, the research methodology and findings are presented. Later, the results are discussed. The paper concludes by summarising the key insights and implications of the study.

Literature Review

Earlier studies on using AI-powered tools note that students generally feel positive about using AI for learning—for example, students like using AI-powered tools for brainstorming (Chan & Hu, 2023). There is further evidence that students' use of AI tools could facilitate inspiration and idea generation. When working on assignments, students report that AI tools help find sources and explanations for difficult-to-understand academic concepts (Skjuve et al., 2023). Rathinasabapathy, Swetha, and Veeranjanyulu (2023) present evidence that AI can help students understand complex research articles, and Berg (2023) reports that AI tools can help students synthesise information and analyse data.

AI tools have had a significant impact on writing. Many studies examine student familiarity with and use of AI tools, such as Grammarly, QuillBot, ChatGPT, and DeepL. These tools revolutionised how students approach writing tasks. For example, students can automate spelling and get grammar checks – elevating the quality of writing (Burkhard, 2022). Students also use AI tools to improve the structure of texts (Barrett & Pack, 2023). Lingard (2023) and Raheem, Anjum, and Ghafar (2023) found that AI-powered tools can improve written expression and argumentation. ChatGPT, Bing AI and Bard are also poised to revolutionise discipline-specific writing. For example, Schwarcz and Choi (2023) found that students can use ChatGPT to perform legal research and write legal documents such as memos, briefs, and contracts.

AI can also assist students with statistics, data science, and finance assignments. Students can use ChatGPT or even GitHub Pilot to improve their coding skills (Guo, 2023). AI tools also improve collaboration, teamwork, and project management – essential transferrable skills gained at a university (McLaren et al., 2010). More specific AI-powered tools help students create podcasts and find technical or creative solutions to their projects. Tools such as podcast.ai, Midjourney, Crayon, or Dall-E can be used to achieve learning goals in economics (Moryl, 2016) and can be applied in marketing and media courses (Wahid et al., 2023; Dehouche & Dehouche, 2023; Murár & Kubovics, 2023).

The application of AI-powered tools in higher education requires an understanding of the negative consequences of AI use. Adeshola and Adepoju (2023) warn educators that

overreliance on AI can make students less engaged with the material compared to the level of engagement students experience during conventional student-lecturer interactions. Barrett and Pack (2023) and Escotet (2023) suggest that using AI to complete assignments may negatively impact students' cognitive abilities. Students practice critical thinking during research, reading, and writing assignments. If skills such as "synthesis" and "summary making" are outsourced to an AI, students will fail to develop critical thinking. Adeshola and Adepoju (2023) also worry that AI will hurt students' cognitive reasoning as students would be tempted to use AI to solve problems.

Blikstad-Bala and Hvistendahl (2013) found that students often fail to engage in the kinds of learning activities that assignments were designed to promote. They report that students often copied or merely reproduced information they found online. Metzger (2007) confirms that students often suffice with the information that they find to complete their assignments and that they do not meticulously evaluate it. Since AI tools can help students simplify their search, the issues mentioned by researchers can intensify. Tossell, Tenhundfeld, Momen, Cooley, and de Visser (2024) say that AI will offer a welcome timesaving for students. However, researchers argue that improved efficiency will not make learning easier. With time, educators will set more complex assignments, which students cannot easily outsource to AI.

AI's benefit to teamwork and collaboration is inconclusive. McLaren et al. (2010) and Osman, Duffy, Chang, and Lee (2011) found that integrating AI into the learning environment can promote student collaboration. It helps students with diverse backgrounds connect, facilitating knowledge sharing, problem-solving, and collaboration. However, students often need more training in using AI-powered collaboration tools, which might decrease motivation and hinder teamwork and collaboration.

AI's use in learning raises several ethical concerns. Borenstein and Howard (2021), Fontanilla, Bautista, Lactao, Villacorte, and Santos (2023), and Fyfe (2023) cite student worries regarding data privacy, academic integrity, cheating, and plagiarism. Students also expressed concerns about how their work will be evaluated (Jeffrey, 2020). While students generally feel positive about using AI in academic settings, they may need more knowledge to routinely work with AI tools (Skjuve et al., 2023). For example, students reported that they experienced receiving irrelevant, wrong, off-topic, and useless output to their queries in ChatGPT. Some also reported that the answers were highly similar, repetitive, lacking depth, or biased (Skjuve et al., 2023; Kumar, 2023; Horodyski, 2023). Universities can better train students to work with these tools more effectively, such as equipping them with prompting skills.

Research Methodology

We surveyed undergraduate business administration students to examine their attitudes, use, and concerns about AI-powered tools. The survey was distributed among first—and final-year bachelor's degree students in a public university in Switzerland. By focusing on first—and final-year students, we wanted to identify if there is any progression in AI use and attitudes from the time students start and finish their studies.

In the survey, we asked students about their prior experience with AI-powered tools and their familiarity and frequency of use of different AI-powered tools across core business administration subject areas. Further, we used a 4-point Likert scale from strongly disagree to strongly agree with an NA option to assess students' attitudes to using AI-powered tools. Additionally, we asked students if they felt adequately trained to use AI tools routinely and which concerns they have regarding AI-powered tool usage. While we developed our own questionnaire, we used some Burkhard (2022) questions.

We piloted the survey in autumn 2023, and data collection was conducted in January and February 2024. Seventy-one first and final-year students completed the survey. The survey was filled out almost equally by men (50.7%) and women (49.3%). Most students (63.4%) were enrolled part-time, and 56.3% (n=40) of the surveyed are final-year students. Consequently, 43.7% (n=31) are in the first year of their studies. Univariate and bivariate descriptive statistics are used to evaluate the survey results.

Research Findings

Familiarity and Usage of AI-powered tools prior to studies

First-year students included in the sample started in September 2023, after the launch of OpenAI's ChatGPT in 2022. Results indicate that 72.7% of respondents have used AI-powered tools before enrolling at a university. Of those students, 51.6% are first-year students, while 15% are final-year students (see Figure 1).

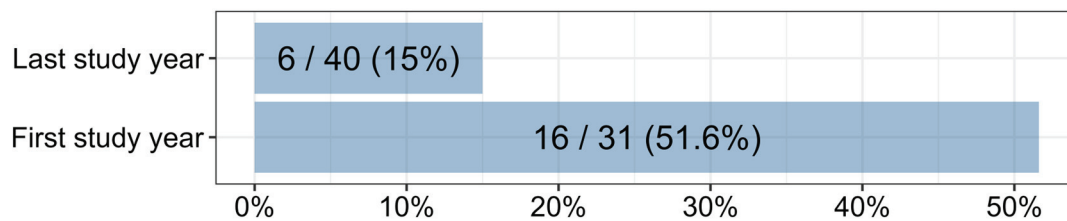


Figure 1: Use of AI-powered tools prior to the start of studies (n=71)

A total of 36.1% of the male respondents indicated that they had used AI-powered tools prior to their studies (first and final-year students), while only 25.7% of the female students had used them prior to their studies.

Familiarity and frequency of use of AI-powered tools

Figure 2 shows the univariate analysis of the familiarity and frequencies of use of different AI-powered tools. 83.1% (n=59) of the students indicated they are familiar with and regularly use language translation tools such as DeepL. All students who participated in the survey appear to know translation tools. Students are also familiar with online writing assistance tools like Grammarly and ChatGPT. 59.2% (n=42) of the respondents said they use these tools regularly. In addition, 33.8% (n=24) of students are familiar with ChatGPT and regularly (18.3%) or rarely (15.5%) use it for coding. Over 50% of the students are unfamiliar with the other AI-powered tools for data analysis, visualisation and presentation, project management, bookkeeping, research, voice-overs, and image generation.

The bivariate analysis results (Figure 3) show that, on average, students in their final year are more familiar with and use online writing assistance tools more regularly than first-year students. There is also a difference regarding familiarity with coding/programming tools. Final-year students are more familiar with these tools than first-year students. Language translation tools are equally known and used by first and final-year students. On average, final-year students are more familiar with other AI tools than first-year students.

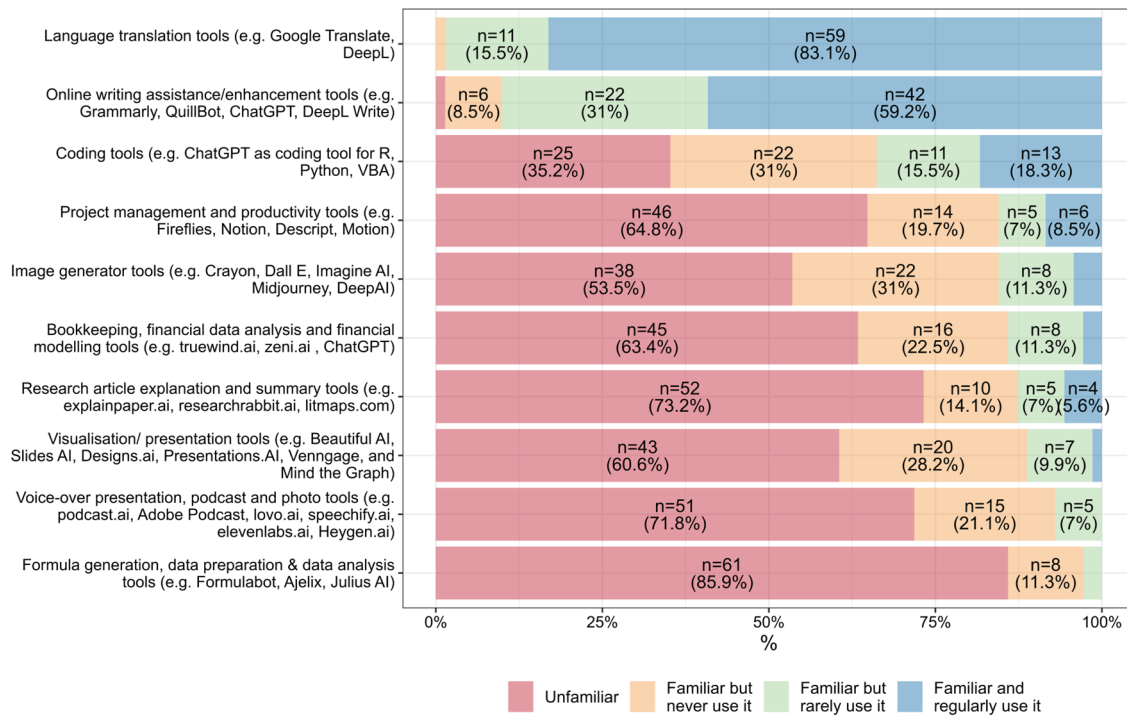


Figure 2: Univariate Analysis of Frequences of Familiarity and Usage (n=71).

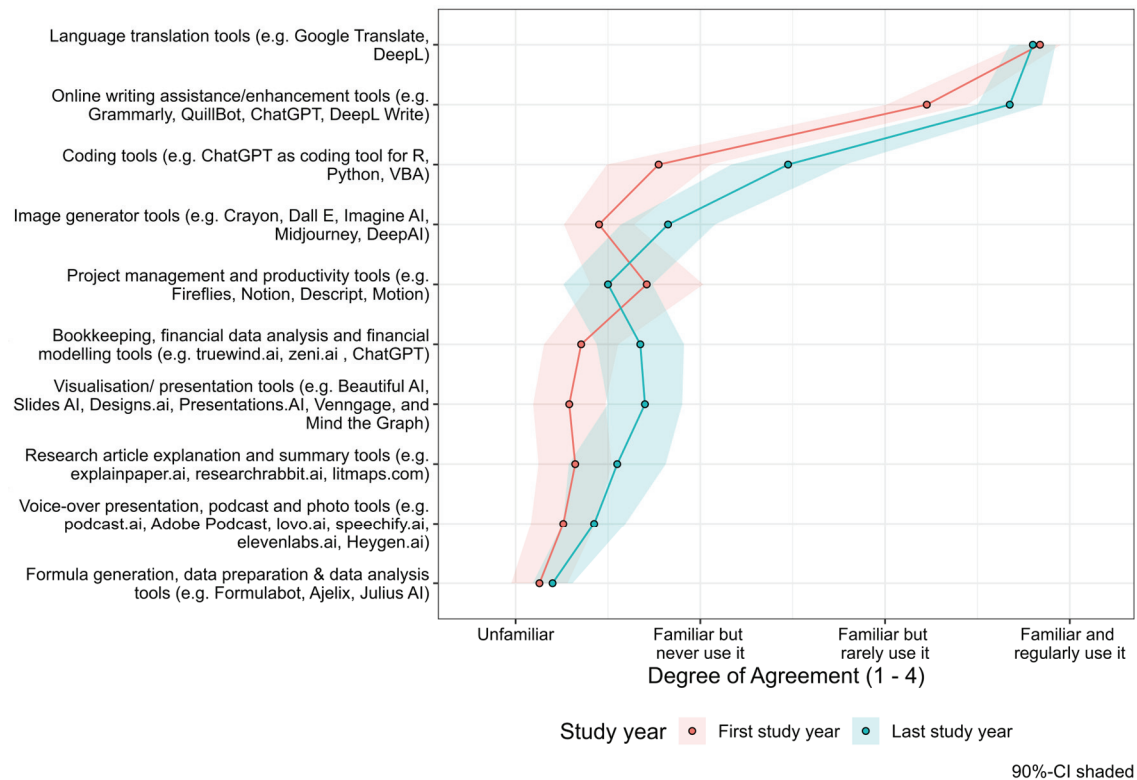


Figure 3: Bivariate Analysis of Frequences of Familiarity and Usage (n=71).

Usage of AI-powered tools in discipline area

Figure 4 shows the use of AI-powered tools by discipline or subject areas. 67.6% (n=48) of the students indicated that they regularly use AI-powered tools in communication modules, whereas mathematics, statistics, and data science are the second most often mentioned subject areas. Less than 15% indicated they use AI-powered tools for finance, economics, law, and information technology.

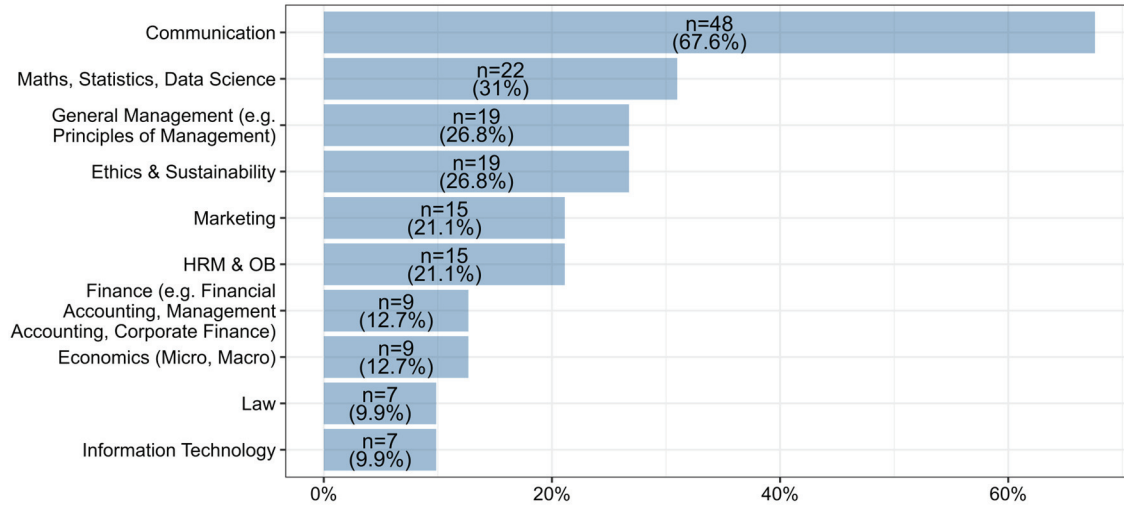


Figure 4: Univariate Analysis of Usage of AI tools by discipline (n=71).

The bivariate descriptive analysis revealed that first-year students primarily use AI-powered communication tools, followed by ethics and sustainability and general management courses. Final-year students also use AI-powered tools primarily in communication, followed by math, statistics, and data science applications, as well as marketing and human resource management courses (Figure 5).

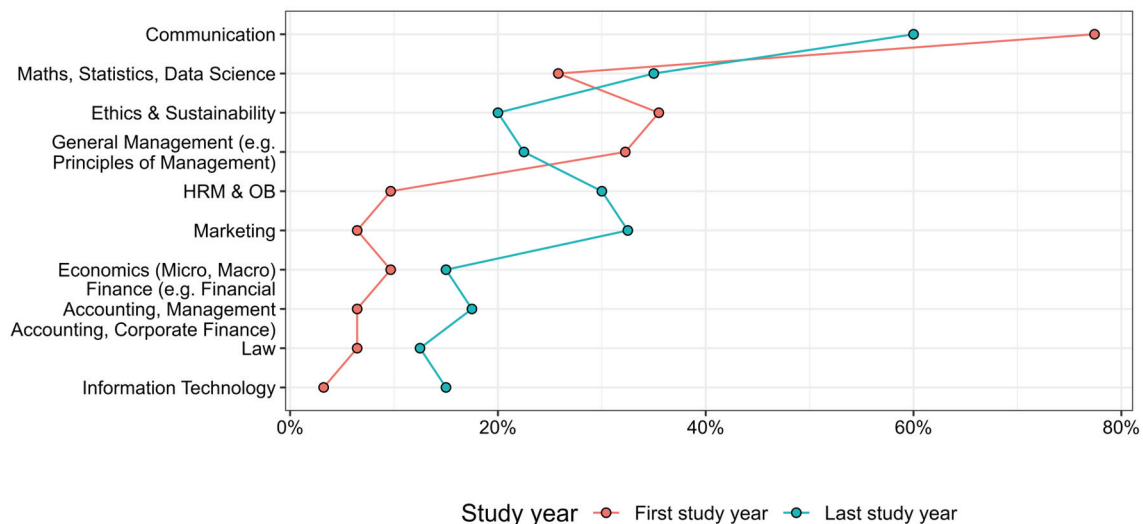


Figure 5: Bivariate Analysis of Usage of AI Tools by Discipline and Study Year

Usage of AI-Powered Tools for Academic Tasks

92.4% of the students agreed or strongly agreed that AI-powered tools help them to translate. In addition, over 75% of the respondents agreed or strongly agreed that AI-powered tools help

them summarise or write a text. This aligns with the results mentioned above, which indicate that the most familiar and regularly used AI tools are translation and online writing assistance tools. Further, over 75% agreed or strongly agreed that AI-powered tools help to brainstorm and generate ideas (89.4%), understand articles and specific topics (78.6%), and find explanations for challenging academic concepts. Only 10.3% strongly agreed that AI tools are helpful for presentations, and only 11.3% strongly agreed that they help find relevant sources and references for their academic work (see Figure 6).

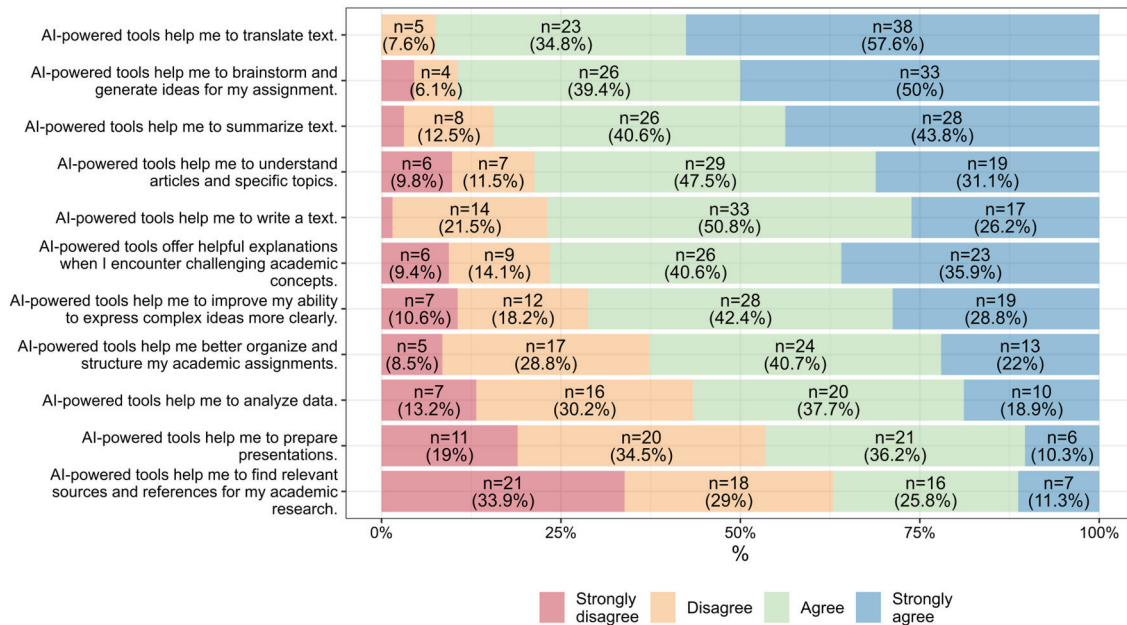


Figure 6: Univariate Analysis of Frequencies of Specific Usage of AI-powered Tools for Academic Tasks

The bivariate descriptive analysis shows no significant differences between first-year and final-year students using AI-powered tools. On average, final-year students agreed more strongly with the statement that AI-powered tools help to analyse data.

Student confidence and training needs in using AI-powered tools for studies

As seen in Figure 7, 84.4% of the students feel positive about using AI-powered tools in their studies. Further, 62.2% agreed or strongly agreed with the statement that they possess the knowledge needed to work with AI routinely. Bivariate analysis indicates that final-year students display more confidence regarding knowledge to work with AI-powered tools routinely and generally feel more positive about using AI. Further, 60.7% said they understand the methods used to assess AI-generated results well. It is surprising, but final-year students feel they need more confidence in understanding the methods used to assess AI-generated results. Univariate analysis shows that 54.7% of respondents do not feel adequately trained and supported to use AI-powered tools effectively in their studies. These results are independent of the study year.

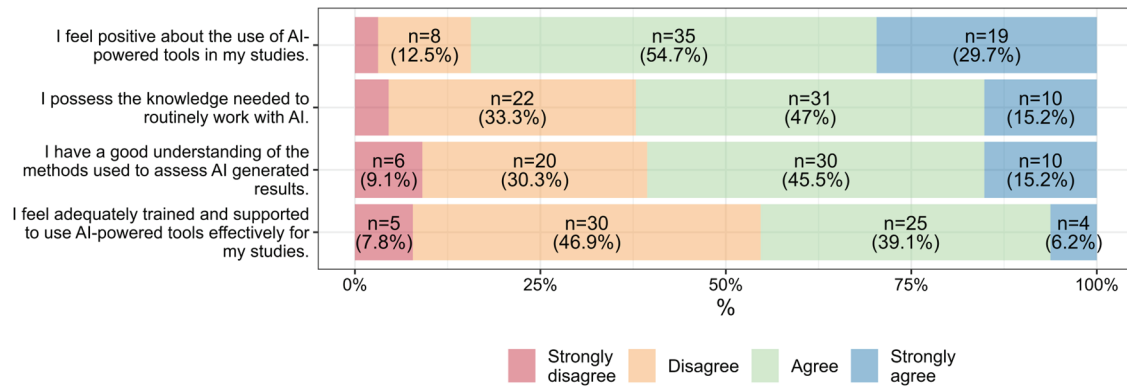


Figure 7: Univariate Frequencies of student confidence and training needs in using AI-powered tools for studies

Student perspectives on concerns and benefits of AI-powered tools

Figure 8 presents the overview of student perceptions about the negative aspects of using AI. 74.7% (n=50) of the students do not think that the use of AI-powered tools decreases their motivation to engage in the learning process actively, and 58.8% (n=40) state that the use will not result in them neglecting essential research and learning skills, this is especially true for final year students. Further, students disagreed or strongly disagreed that AI-powered tools hinder their development of skills such as critical thinking (n=45, 66.2%), collaboration, and teamwork (n=51, 75%). Still, students worry that the usage of AI-powered tools results in content that does not meet the specific requirements and expectations of the lecturer (70.5%, n=43). They are further aware that the generated content can lack the depth and nuance required for advanced academic work (65.1%, n=41). Only about 55% of the students agree or strongly agree that using AI-powered tools leads to ethical dilemmas (58.1%) and encourages students to take shortcuts in their academic work (56.7%).

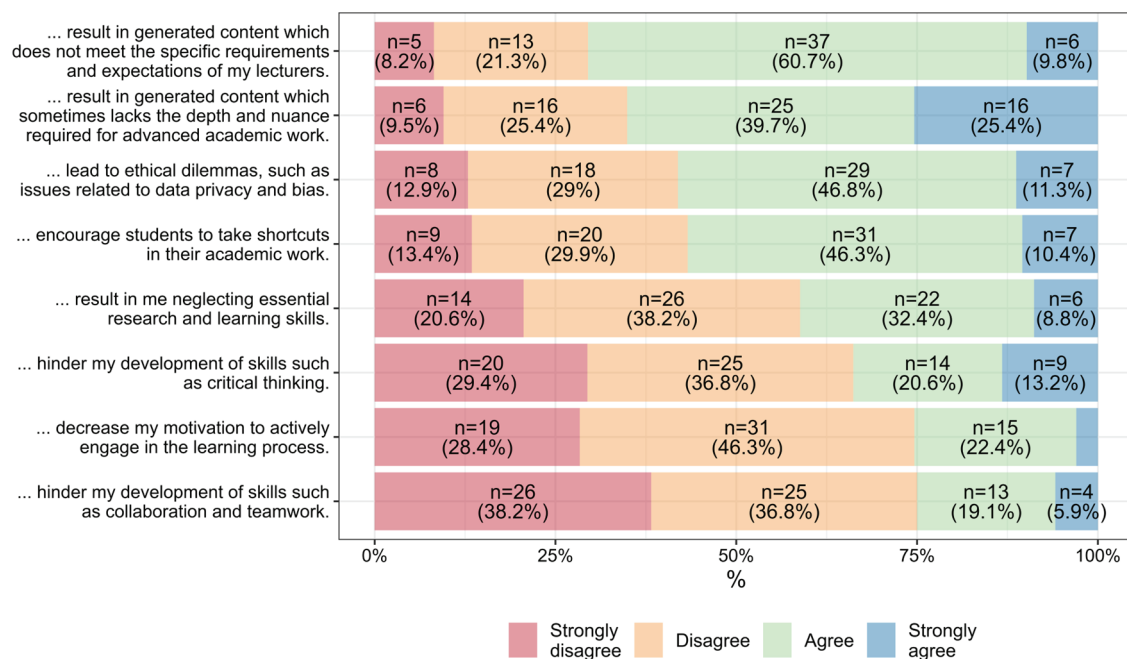


Figure 8: Univariate Frequencies of Negatives and Barriers

The bivariate descriptive analysis shows that final-year students are significantly less worried than their first-year counterparts that AI-generated content may not meet academic standards or lecturer expectations. Instead, they are more concerned that using AI-powered tools may lead to them neglecting essential research and learning skills and taking shortcuts when learning.

Discussion

Student familiarity and usage of AI-powered tools for studies

Our study reveals that roughly one-third of the students had knowledge of AI-powered tools before their university enrolment, with first-year students exhibiting higher usage than their final-year counterparts. While AI language translation and grammar correction tools existed before 2022, they were not widely used in higher education (Smolentceva, 2018). The introduction of ChatGPT in 2022 propelled interest in AI, with ChatGPT finding immediate application in higher education (Hu, 2023). This is likely why first-year students exhibit higher familiarity and usage rates of AI before their studies.

Over 60% of students use ChatGPT, Grammarly, and other online writing assistance tools regularly. Language translation tools also have widespread familiarity and regular use, irrespective of study years. Our study indicates that AI-powered tools are used most regularly in communication courses. Interestingly, final-year students exhibit greater familiarity and use of ChatGPT than first-year students. Even though final-year students started their studies before the proliferation of AI tools, they quickly developed an interest in and adopted them. Since they are further in their studies, they apply AI tools in more advanced settings and in other subjects. Further, we found that familiarity and use of other AI tools for visualisation, creation of presentations, and other specialised tasks are limited among the students, with final-year students generally exhibiting slightly higher familiarity.

Student perspectives on the benefits of AI-powered tools

ChatGPT emerges as a frontrunner in writing, research, and communication disciplines. However, students also use DeepL, QuillBot, and Grammarly for text translation and correction, to create summaries, and to write texts. This aligns with the results mentioned above, which indicate that the most familiar and regularly used AI tools are translation and online writing assistance tools. Our study confirms that students use AI-powered tools to improve their language and argumentation skills (Chan & Hu, 2023; Burkhard, 2022; Berg, 2023; Lingard, 2023; Raheem et al., 2023). Our study contributes to previous studies of Chan and Hu (2023) and Skjuve et al. (2023) and shows that students use AI-powered tools to brainstorm, generate ideas, and gain a better understanding of specific topics. However, students show limited use of AI for presentations and search for sources. While Rathinasabapathy et al. (2023) suggest that AI can facilitate research tasks, our findings offer no support. Students rely primarily on ChatGPT, and its search output is limited to publicly available text on the internet and, thus, not suitable for most literature reviews (Meyer et al., 2023).

Student perspectives on limitations and barriers of AI-powered tools use

Our study confirms that students are aware of the limitations of AI use. However, the ability to meet specific requirements and expectations of the lecturer concerns students more than other risks. Students mention that universities need to create guidelines on when and how AI can be used in coursework. In a student perception of AI study, Jeffery (2020) also mentions students' concerns with grading. Our findings further show that students are aware that AI-generated content might fail to meet academic standards and create output that is not suitable. Some students expressed frustrations that AI-generated output was too simple and repetitive and did

not meet requirements. These concerns were also mentioned by Skjuve et al. (2023) and Tossell et al. (2024). Research warns that the use of AI can make students less engaged and motivated, and it could have a negative impact on the development of students' critical thinking (Adeshola & Adepoju, 2023; Barrett & Pack, 2023; Escotet, 2023). However, our results cannot offer conclusive evidence for this. Students disagree that using AI-powered tools will decrease their motivation or engagement with learning.

Further, our findings confirm that the use of AI-powered tools has a positive impact on student collaboration and teamwork efforts. McLaren et al. (2010) identified that AI tools can improve team collaboration. However, open-ended responses to questions highlight that not all students enjoy team assignments in the age of AI, as there are instances of cheating.

Only around 58% of students agree that AI use has ethical implications - a relatively low percentage that underscores the pressing need to make students aware of and educate them regarding the ethical implications of AI use. Huallpa (2023) explored ethical considerations of using ChatGPT in university education and found that students had a relatively favourable impression and experience with ChatGPT, and while they are aware of moral considerations, they are not necessarily worried about them. Still, Tossell et al. (2024) and Fyfe (2023) highlight the importance of raising awareness of data privacy, cheating, plagiarism, and academic integrity risks when using AI for coursework.

Student perspectives on education and support needs in AI-powered tools

We found no significant differences between first- and final-year student responses regarding education needs and support for using AI-powered tools. Final-year students are more confident than first-year students with the quality of AI-generated content and are less worried about their inability to meet academic standards. It can be assumed that final-year students have more experience and thus are better at using correct prompts to generate higher quality and more relevant output (Kumar, 2023), while first-year students lack the experience to work with AI routinely. Still, students responded that the university could do more to support them in using AI. For example, students felt they had sufficient knowledge to work with AI routinely. However, they did not feel adequately trained and supported by the university to use AI-powered tools effectively.

Conclusion

Our study contributes to the ongoing discussion about students' familiarity, usage, and perceptions of AI-powered tools in higher education. We specifically emphasise differences between first- and final-year students to determine whether there is any progression in the usage of AI tools and attitudes.

We found that first-year students generally exhibit higher familiarity and usage rates of AI before their studies. However, on average, final-year students exhibit greater familiarity and regular use of more task-specific AI-powered tools, especially ChatGPT, than first-year students. We further found that all students are familiar with language translation tools, and over 60% of the students are familiar with and use online writing assistance tools regularly, showing a widespread integration of AI tools in higher education.

Contrary to the concerns raised, our findings do not support the notion that AI-powered tools negatively impact student engagement, motivation, or critical thinking skills. Students are aware of AI limitations and express concerns about not meeting the requirements and expectations of lecturers. These concerns align with the findings of Skjuve et al. (2023) and Tossell et al. (2024). Notably, only around 58% of those surveyed agree that using AI-powered tools leads to ethical dilemmas, underscoring a pressing need to make students aware of ethical

implications. Students further expressed the wish for the university to create guidelines on when and how AI can be used in coursework. In sum, the results of this study support curriculum development by illustrating where students currently stand, which tools most use, and to what extent they should be further sensitised.

The results of our study are limited to this context, and more significant generalisations cannot be made due to the low number of respondents. Further studies should analyse in more detail the use of AI-powered tools for coursework and their implications on the engagement and motivation of students while working in groups. Furthermore, analysing the differences between first-year and final-year students some time from now, when ChatGPT will have been launched before the start of all enrolled students, could provide further insights into students' progression in using AI-powered tools. As the educational landscape continues to evolve, fostering a comprehensive understanding of the role of AI-powered tools in higher education is imperative for its responsible and effective integration into teaching and learning practices.

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