Elevating Education: Exploring The Impact of AI-Integration in Higher Education

Master Thesis

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Olten, June 2024

Zusammenfassung

Aktuellen Studien haben zahlreichen Vorteile und Herausforderungen der Einbeziehung von GenAI-Tools in die Bildung aufgezeigt. Sehr wenige Studien untersuchten die Auswirkungen einer gesteuerten KI-Integration auf die Perspektiven von Studierenden und Dozierenden. Ausserdem bezogen sich die meisten davon auf ChatGPT und schlossen Psychologiestudierenden nicht ein. Mit einem Mixed-Methods Ansatz zielte diese Masterarbeit darauf ab, (1) zu ermitteln, was für Ausprägungen gesteuerten Erfahrungen auf die Perspektiven von Psychologie-studierenden unterschiedlicher akademischer Ebene hinsichtlich der KI-Integration hatten, und (2) welche Perspektiven Psychologiedozierenden zur KI-Integration hatten. Es wurden auch weitere KI-Tools berücksichtigt. Die Ergebnisse zeigten gemischte Meinungen über KI-Integration und selbstberichtete Einstellungsänderungen, die auf die jeweiligen Interventionen bezogen wurden. Alle Dozierenden waren der KI-Integration gegenüber aufgeschlossen, während einige Studierende damit nicht einverstanden waren. Während BSc-Studierenden eine Steigerung ihrer digitalen Kompetenz wahrnahmen, gaben MSc-, CAS- und MAS-Studierenden an, dass sie noch mehr lernen müssten. Es wurden unterschiedliche Bedenken hinsichtlich der Auswirkungen der KI-Nutzung auf verschiedene Themen wie Leistung, sinnvolle und ethische KI-Nutzung, Datenschutz usw. Die meisten Teilnehmende wünschten sich weiterer Schulung und Leitlinien seitens der Hochschule. Insgesamt gibt es viele Faktoren, die bei der KI-Integration berücksichtigt werden müssen. Die Stimmen von Studierenden und Dozierenden müssen berücksichtigt werden, und die Steigerung von digitalen Kompetenzen muss priorisiert werden.

Schlagwörter: KI-Integration, digitale Kompetenzen, Bedenken, Perspektivenwechsel, Schulung und Unterstützung

Abstract

Recent studies have highlighted numerous advantages and challenges of integrating GenAI tools within higher education. Very few studies explored the impact of guided integration of ChatGPT on the perspectives of students and lecturers outside the field of psychology. Using a mixed methods approach, this thesis aimed to uncover (1) what impact guided experience would have on the perspectives of psychology students from different academic levels regarding AI-integration and (2) what the perspectives of psychology lecturers on AI-integration were. More AI tools were also taken into consideration. Outcomes indicated mixed opinions about AI-integration and self-reported changes in attitudes attributed to the interventions. All lecturers were accepting of AI-integration whereas some students disagreed with it. While bachelor students perceived an increase in their digital competency, students from other levels expressed there was more to learn. Varying concerns were raised regarding the impact of AI-use on different topics such as performance assessment, balanced and ethical AI-use. Furthermore, there was a desire for further training and guidelines from the university. In conclusion, there are many factors to keep in mind to facilitate the integration of AI in higher education and should involve students and lecturers. Digital literacy must ultimately be prioritised.

Keywords: AI--integration, digital competency, concerns, perspective shifts, training and support

Anzahl Zeichen: 214’783

Acknowledgments

I would first and foremost like to thank Dr. Stefan Michel for his immense support and encouragement during my master's thesis. You empowered me to own this topic and I benefitted greatly from your expertise and empathetic supervision. I could not have had a better experience.

Special thanks to all participants for their willingness and openness especially during the interviews. Your exciting perspectives broadened my own view on the topic.

My gratitude also goes to my family and friends who supported and cheered me on. Thank you for believing in me.

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CHAPTER 1: INTRODUCTION

Elevating Education: Exploring The Impact of AI-Integration in Higher Education

We reside in an ever-evolving world, one where technology, notably Generative Artificial Intelligence (GenAI), has left a profound impact on our work, daily lives, and even the realm of education (Ma & Siau, 2018). Recent studies highlighted numerous advantages of integrating AI tools into higher education, including enhanced collaboration, language translation, personalized learning, support for instructional delivery, and the creation of interactive learning activities (Fauzi et al., 2023; Firat, 2023a; Halaweh, 2023; Kalla & Smith, 2023). It was however crucial to equally acknowledge its limitations such as misinformation, bias, the generation of erroneous citations, and negative impacts such as the risk of plagiarism, overreliance, diminishing academic integrity, and challenges in validating learning experiences (Firat, 2023b; Halaweh, 2023; Kalla & Smith, 2023). With both in mind, it is imperative that students are provided with the right guidance on how to incorporate AI tools with academic work.

According to Romero Rodríguez et al. (2023), one key dimension in connecting AI and education is building digital literacy. It is important that students are trained to consider reflective, ethical, and responsible use of AI as a complementary tool to learning (Elkhodr et al., 2023). Although some universities have banned AI-use, others have adapted policies and the structure of assessments to avoid misuse (Romero Rodríguez et al., 2023). The School of Applied Psychology (APS[1]) at the University of Applied Arts and Sciences, Northwestern Switzerland (FHNW[2]) has been actively taking strides in experimenting with ways to efficiently incorporate AI across

[1] Hochschule Angewandte Psychologie
[2] Fachhochschule Nordwestschweiz

different academic levels. This included a project involving different settings, target groups, and a range of AI tools. Within the APS faculty, large volumes of text and data in different languages (although mainly German) are constantly processed. These are activities which many AI tools could support. The primary objective of this project was to cultivate critical, ethical, and digital competencies, enabling students to navigate the incorporation of AI tools across various learning phases, for example, support with academic research and scientific writing. Students across different academic levels were provided with a comprehensive understanding (including examples) of selected AI tools to inform them on building strategies for effective AI-use. These tools were ChatGPT, Consensus AI, SciSpace, Litmaps, DeepL Write, Microsoft Bing, Google Bard, and Research Rabbit. With this intervention, they were then provided the opportunity to incorporate the use of any of these tools as support for their respective assignments. The aims were to improve the quality of teaching and learning using AI tools, cultivate digital competencies, and develop processes and checklists for guided use and integration.

Research Gap

Regardless of the slowly growing acceptance of AI-integration in the academic setting, it is still considered a controversial subject and there exists a research gap on the implications of practical AI-integration within the discipline of psychology. There is little known about how training psychology students to collaborate with AI tools critically and creatively would impact their perceptions and attitudes regarding AI-integration. Very few studies have measured the impact of tailored experience on possible changes in perspectives. Furthermore, studies that recommended strategies for AI-integration hardly included the opinions of students on what they needed to ensure that this integration is effective enough to support the achievement of their academic goals. For example, what were the benefits and challenges students discovered while

using AI for academic tasks and how did their experience influence their decision to continue or discontinue use of AI? Or what were students' concerns about AI-integration and how were these influenced by receiving training and contextual use-cases from lecturers?

Despite the concerns raised by educators and researchers in previous studies, there is little known about what lecturers need to support their students' use of AI. Another question was how their own use influenced their openness to AI-integration and the kind of impact they perceived on learning outcomes and skill-development. Should universities consider designing ways to integrate AI within the institution, the perspectives of both students and lecturers need to be incorporated so that content can be tailored to meet the respective needs. It is imperative to address their concerns and ethical dilemmas. It is also important to note that within the academic setting, students and lecturers consist of individuals used to different teaching and learning methods. Likewise, students may experience AI-integration differently due to the degree of academic and professional experience they have. This highlights the need to include a wider scope of students to better understand the dynamics impacting AI-integration.

Problem Statement

This thesis stemmed from the larger project within the APS and aimed to investigate the issues raised above by using a mixed methods exploratory approach. First, the author endeavoured to understand the perspective shifts of psychology students across different academic levels following their engagement with AI tools for their assignments. This revolved around discerning students' perceptions of a variety of topics related to AI-integration and use behaviour induced by experience. Secondly, it sought to investigate the opinions of psychology lecturers (who taught at these academic levels) on the integration of AI within the academic institution. This was taken

into consideration as it was assumed that lecturers could potentially impact students' own perspectives and use behaviour.

Research Questions

The overarching research question was "What are the perceptions of students after experimenting with AI tools for academic work?" This thesis focused heavily on the contributions from students as they were the biggest stakeholders with regards to AI-integration. This question included both hypotheses and general topics to be explored. The sub-focus of this thesis was to answer the question "What are the perspectives of lecturers regarding integration of AI tools?"

Due to the novelty of the topic, both inductive and deductive approaches were used to compensate for areas that had less empirical background. Furthermore, both the hypotheses as well as general exploratory points were generated to better structure the exploration of and provide complementary insights on a variety of topics and outcomes. These are presented below.

Hypotheses

H_1: BSc students will feel more confident about their digital competency after the introductory seminar.

Students found it relatively easier to adopt to new technologies in comparison to teachers (Sullivan et al., 2023). Digital literacy can be enhanced by providing training and practical experience to improve knowledge and develop skills required for efficient use of AI for academic work (Dongmo et al., 2023; Rudolph et al., 2023). Furthermore, training was suggested to reduce digital inequity between students who already had experience with AI and those who did not by building confidence in the latter group (Sullivan et al., 2023). Receiving guidance and clear expectations for AI-use from lecturers have been suggested to encourage students to be more reflective and shape use behaviour (Bitzenbauer, 2023; Dai et al., 2023; Sullivan et al., 2023).

H_2: Students will prefer interactions with people for academic work related to "Understanding New Concepts" and "Presentations".

Performance assessments such as presentations and group work were proven to be difficult for AI tools to mimic (Sullivan et al., 2023). Where AI tools were limited in their capacity to provide in-depth analysis of students' abilities, teachers were more flexible in providing guidance during the learning process of students as well as effectively deliver instructions (Ausat et al., 2023). Neumann et al. (2023) argued that students could only use AI tools as a learning aid once they had received contextual knowledge from their teachers. Elkhodr et al. (2023) revealed students preferred human-generated hints over AI-generated hints in an algebra class, raising the importance to differentiate tasks for which students will prefer human assistance over AI-support.

H_3: Students will be interested in acquiring digital competencies for their (future) jobs.

AI tools are changing the job market by improving the productivity of the workplace. Benefits include enhancing copywriting, language translation, and automation of tasks, although this is not an exhaustive list (Zhai, 2022). In order to boost performance and increase employability, it was pointed out that students would need to upskill and develop the ability to critically and efficiently use AI (Atlas, 2023; Neumann et al., 2023; Sullivan et al., 2023). Recommendations included that the educational sector provided the opportunity to practice solving real-world problems using AI tools to build mastery and in turn better position students on the job market (Rudolph et al., 2023; Zhai, 2022).

A fourth hypothesis which stated 'The concerns of BSc students would reduce after the introductory seminar' was eventually dropped as the author realised that this was difficult to quantify due to the changes in the types of concerns and not the frequency. These findings are nonetheless presented under the related topics in this thesis.

General Topics

The further topics explored within this thesis were based on a combination of factors from the Unified Theory of Acceptance and Use of Technology (UTAUT) model and themes and gaps derived from other studies. These included:

- use of AI, including types of AI tools used, reasons for use or non-/discontinued use, frequency of use, and rating of the selected range of AI tools.
- self-perceived confidence in digital competency regarding use of AI tools.
- perceived benefits, challenges, and general concerns regarding AI-integration for academic work.
- preferences and perceived impact of using AI tools for academic work, including perceived relevance for the field of study and jobs.

Relevance

From a practical viewpoint, insights gained from this thesis provided recommendations that could optimize AI-integration in higher education through the consideration of the perspectives of both psychology students and lecturers. It was important to have a comprehensive understanding of various dynamics that could impact integration based on practical experience. This could help avoid making decisions based on assumptions and facilitate co-creation.

From a theoretical viewpoint, this thesis provided an insight into the effects of AI-training on the perspectives and experiences of psychology students across different levels. Moreover, factors that influenced the opinions of the students were explored, which could not have been uncovered through a traditional quantitative approach. Some findings also uncovered how and why different factors were interconnected.

CHAPTER 2: LITERATURE REVIEW

This chapter provides an overview of how AI functions, followed by the theoretical framework chosen to guide this thesis, and concludes with an in-depth review of a variety of studies that were focused on the use of AI in the educational context.

Understanding Artificial Intelligence

Artificial Intelligence (AI) can be defined as computing systems with the ability for human-like processes such as using data to process complex tasks, learning and adaptation, self-correction, amongst others (Crompton et al., 2020). While one category of AI focuses on highly specific tasks like self-driving vehicles and home assistants, another category capable of logical deduction can perform multiple tasks that require an understanding of human language (Ma & Siau, 2018). The scope of this thesis focused on the latter category, more specifically, on Generative AI (GenAI) tools that incorporated the use of either Large Language Models (LLM), Generative Pre-trained Transformers (GPT) or relatively simpler Machine Learning (ML) models. The subsequent use of the terms "AI" and "AI tools" referred to GenAI tools.

Generative Artificial Intelligence (GenAI)

These are AI tools with the capability to create new data and content such as images, videos, text, or music, based on their training data (Toloka, 2024). This data is typically collated from websites, online forums, social media, amongst others (Wayne et al., 2023). These tools involve the use of Machine Learning models, which is a type of artificial intelligence that utilizes data analysis to enable computers learn (Wayne et al., 2023). It works by training AI systems on vast range of algorithmic models to personalize recommendations and visualizations based on a user's request (Wayne et al., 2023). These models function by mathematically representing or labelling datasets based on underlying patterns, from which AI then learns to identify and make

predictions for new datasets (Toloka, 2024). This learning process involves iterative repetitions and modifications until they are able to predict outputs (Helm et al., 2020). Their design mimics the structure and functionality of the human brain, serving as the foundation and further development of large language models (Wayne et al., 2023).

More specific applications of machine learning led to the development of Large Language Models (LLM) which was in turn further fine-tuned to create the Generative Pre-trained Transformers (GPT) (Chang et al., 2023; Halaweh, 2023). Both LLMs and GPTs have the ability to understand, process and predict natural human language in order to generate intelligent responses to user prompts (Chang et al., 2023). They can also learn in-context based on feedback from users, enabling them to generate responses that are more relevant and coherent with the desired context (Chang et al., 2023). While the various models explained build on each other, it is important to note that the GenAI tools in scope of this thesis (ChatGPT, Google Bard, Consensus AI, SciSpace, Microsoft Bing Chat, DeepL Write, ResearchRabbit, and Litmaps) are each based on one of these models and may collaborate with other models to improve their performance.

To briefly classify the kind of support the GenAI tools in scope offer, Consensus AI, SciSpace, Litmaps and ResearchRabbit are AI research assistants (Stapleton, 2024). DeepL Write is an AI tool that supports writing by offering suggestions on tone, phrasing, vocabulary, and grammar in multiple languages (George, 2024). ChatGPT and Google Bard are standalone chatbots whereas Microsoft (MS) Bing (now called MS Copilot) is a chatbot integrated into Microsoft's search engine (Redillas, 2024; Wolber, 2023). These 3 offer a wide range of possibilities, including (but not limited to) providing answers to questions, creation of media, and in the case of MS Bing, enhance web searches and suggest product/service vendors (Redillas, 2024; Wolber, 2023).

General Benefits and Limitations of AI

AI tools are gradually becoming applicable in various industries such as marketing, healthcare, pedagogy/education, and business, as they can process customer service requests, create content in a variety of formats (i.e. text, picture, video), support with prototyping, generate programming codes, assist with medical diagnosing, and much more (Dai et al., 2023; Halaweh, 2023; Shoufan, 2023; Wayne et al., 2023). They are fast, consistent, fun to use, coherent, able to simultaneously process and engage in large volumes of meaningful conversations, versatile, time efficient, and cost-effective (Chan & Hu, 2023; Shoufan, 2023; Strzelecki, 2023). Dwivedi et al. (2023) acknowledged that just like other computer-based statistical packages, AI can now enhance research activities and would eventually become more relevant for academia. In comparison to traditional search engines, AI tools do not simply retrieve information, but have the capacity to curate new and relevant information, meaning that their performance is dependent on the kind of prompts (instructions) provided (Shoufan, 2023).

Nevertheless, they also have their limitations, which include factual inconsistencies, biased responses due to the training data used, lack of emotional intelligence, and they raise concerns about data privacy and security (Firat, 2023a; Kalla & Smith, 2023; Shoufan, 2023). Due to their complex modelling and functionality, users may feel less trusting of and less likely to use AI tools (Dwivedi et al., 2023). Further limitations include AI's inability to fully understand the context of questions asked if this is not explicitly described in the prompt, limited access to real-time informational updates, inconsistent responses to the same question, questionable quality and reliability of outputs, as well as its inability to generate clarifying questions to provide better responses that fit the user's desired context (Dwivedi et al., 2023; Rudolph et al., 2023).

Artificial Intelligence in Education

Theoretical Framework

The theoretical framework of this paper was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) model proposed by Venkatesh et al. (2003), an extensively used model pertaining to emerging innovative technologies such as chatbots, virtual assistants, e-learning platforms, mobile apps and more recently, GenAI (Dash et al., 2023; Menon & Shilpa, 2023; Strzelecki, 2023; Xue et al., 2024). This model measures the perceptions, behaviour intention, and use behaviour of users and/or potential users to provide insights on predictive factors for technology adoption including perceived barriers that may limit adoption (Dash et al., 2023; Menon & Shilpa, 2023). These insights have guided the approach of other research studies, interventions, organisational strategies and training for new technology integration in various contexts, including the educational sector (Alshabeb et al., 2020; Attuquayefio & Addo, 2014; Chatterjee & Bhattacharjee, 2020; Dash et al., 2023; Strzelecki, 2023).

According to the UTAUT model, acceptance of technology, behaviour intention and use behaviour can be determined by two categories of factors: Main Factors (*Performance Expectancy, Effort expectancy, Facilitating Conditions,* and *Social Influence*) which may have a direct influence on attitudes, intentions and actual behaviour, and Moderating Factors (*Age*, *Gender*, *Experience*, and *Voluntariness of Use*) which may indirectly influence attitudes, intentions and actual behaviour by directly influencing the main factors (Venkatesh et al., 2003).

Depending on the focal point and needs of a study, this model provides a strong foundation for exploration. Previous studies adapted its constructs to either guide or define a new research approach (Alshabeb et al., 2020; Bitzenbauer, 2023; Bubaš et al., 2024; Dash et al., 2023; Hasija & Esper, 2022; Menon & Shilpa, 2023). The same was done for this thesis in that the

model was adapted to explore the perceptions and use behaviour of psychology students across different academic levels and lecturers regarding AI-integration. The aim for this approach was to gain deeper insights on the practical impact of AI-integration for academic purposes on the perspectives of relevant stakeholders i.e. students and lecturers.

The strength of this model lies its comprehensive combination of 8 other theories and models[3], making it robust in understanding a variety of factors like motivations and barriers that can predict acceptance, intention to use, and use of new technology (Bubaš et al., 2024; Hasija & Esper, 2022; Menon & Shilpa, 2023). Its limitation nonetheless lies in the fact that it involves too many factors, making it a complex model that underestimated the overlap of some factors (Chatterjee & Bhattacharjee, 2020). Furthermore, those who apply this framework must assume whether acceptance refers to mass use or actual integration (Bonsu & Baffour-Koduah, 2023).

Factors Impacting AI-Integration

Based on the UTAUT model, Performance Expectancy (PE), Effort expectancy (EE), Facilitating Conditions (FC), and Social Influence (SI) are factors that can predict the acceptance and use of AI. It is suggested to view PE and EE as constructs that focus on the technology itself and FC and SI as constructs that focus on implementation (Chatterjee & Bhattacharjee, 2020). While some studies did not base their framework on this model, a thematic overview of their findings revealed that some of the highlighted motivations and barriers for use easily fitted under one or more of the factors listed above (Amani et al., 2023; Bitzenbauer, 2023; Bonsu & Baffour-

[3] These include Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Theory of Reasoned Action (TRA), Innovation Diffusion Theory (IDT) Social Cognitive Theory (SCT), Motivation Model (MM), Model of PC Utilisation, and Combined TAM and TPB

Koduah, 2023; Dwivedi et al., 2023; Elkhodr et al., 2023; Tajik & Tajik, 2023). A need has been expressed to understand how these factors influence perspective shifts and explore what these shifts are (Bonsu & Baffour-Koduah, 2023), which was one of the aims of this thesis. The terms *AI-use* and *AI-integration* would be used interchangeably.

Performance Expectancy (PE)

PE is the extent to which a person assesses the usefulness of a technology in enhancing productivity (Venkatesh et al., 2003). Productivity can be measured in two forms: efficiency in terms of time to complete a given task and effectiveness in terms of the output quality (Dwivedi et al., 2023). According to Venkatesh et al. (2003), this has a direct impact on behaviour intention and factors the attitude of the individual. The perception of a technology's usefulness is further impacted by the opportunity to observe and test this tool, as well as the complexity of the tool itself (Al-Rahmi et al., 2019).

In a more recent study, it was determined that students who expected high AI-performance had the intention or were ready to adopt AI (Strzelecki, 2023). AI facilitated a wholesome experience through interactive explanations that enabled students better understand concepts (Kalla & Smith, 2023). It was likened to virtual assistants that improved productivity and subsequently increased the general motivation of students (Fauzi et al., 2023; Kalla & Smith, 2023). For lecturers, AI offers support with tasks that involve the planning and structuring of modules, writing and updating instructions and learning objectives, optimizing assessments and feedback, and finding ways to keep students engaged (Dwivedi et al., 2023; Tajik & Tajik, 2023).

While Chatterjee & Bhattacharjee (2020) argued that PE had no significant impact on the attitudes of users, the reported versatility and multifunctionality of AI presented a high PE and therefore encouraged intention to use amongst students in other studies (Halaweh, 2023; Kalla &

Smith, 2023). These benefits included quicker resolution of repetitive tasks, which reduced workload and allowed students to focus on more essential learning activities, personalization of learning strategies and recommendations for self-regulation, and digital support for other tools and activities such as programming and data analysis (Fauzi et al., 2023; Firat, 2023b, 2023a; Rudolph et al., 2023; Strzelecki, 2023). Some students were however aware of AI's limited data sourcing and questionable quality of outputs and used it with caution (Dai et al., 2023).

One critique is that perspectives of students across different academic levels on this topic have not been compared. It remains unknown whether PE is perceived differently by new or more experienced students and whether this impacts their use of AI.

Effort Expectancy (EE)

EE is the extent to which a person assesses the usability of a technology (Venkatesh et al., 2003). According to Venkatesh et al. (2003), this has a direct impact on behaviour intention and factors the attitude of the individual, as well as their self-efficacy and anxiety regarding use. Strzelecki (2023) determined that students found AI both easy and enjoyable to use and thus reported a low EE and greater likelihood of use. As a further finding, students were used to interacting with other chatbots, to which AI was likened, and required low effort to use (Bitzenbauer, 2023; Neumann et al., 2023; Rudolph et al., 2023; Sullivan et al., 2023; Tajik & Tajik, 2023). In addition to user-friendliness, it was found that when AI-use was goal-oriented, EE was low and relatively straightforward (Dongmo et al., 2023). Some studies discovered that experience gained through observation and exploration of AI tools reduced uncertainty about use, which in turn reduced effort required for use (Romero Rodríguez et al., 2023; Yilmaz et al., 2023). Findings from Chatterjee & Bhattacharjee (2020) indicated that facilitating conditions (explained below) had a significant impact on EE. Some students reported that AI could not be used without

having both a knowledgebase of how it worked and prior knowledge of the learning content (Bitzenbauer, 2023; Shoufan, 2023). The ability to generate prompts and evaluate responses was dependent on both factors (Shoufan, 2023).

A concern was raised about the need for higher order skills such as critical thinking and problem-solving to verify the accuracy of outputs and that these skills would need to be developed prior to AI-use (Fuchs, 2023). In addition to this, some users reported feeling less trusting of and less likely to use AI tools as they did not understand why and how certain responses were generated (Wayne et al., 2023). The modelling and functionality of AI tools were perceived as complex and increased the EE of some users (Wayne et al., 2023).

This poses a question on how much effort is truly required to use AI if there is the need for external support to guide and facilitate use. Moreover, the perspectives of students across different academic levels regarding this topic have not been compared.

Facilitating Condition (FC)

FC is the extent to which a person assesses their own compatibility (digital literacy/ competency and need) with a technology and the availability of external resources (technical/organisational support, training) that may "facilitate" use (Venkatesh et al., 2003). According to Venkatesh et al. (2003), this directly impacts use behaviour and is moderated by experience and EE (to an extent). In a study by Strzelecki (2023), students considered additional resources redundant as AI had a user-friendly interface that required simple prompt-based navigation which could also be done in multiple languages. Other studies have however argued that both students and teachers required support for the use of AI as this was especially important for ensuring technological compatibility (Neumann et al., 2023; Tajik & Tajik, 2023).

Both digital literacy and higher-order skills such as critical thinking and problem-solving have been flagged important for efficient use of AI (Elkhodr et al., 2023; Firat, 2023b; Fuchs, 2023; Tlili et al., 2023). Digital literacy is defined as AI-relevant knowledge that enables users to make informed decisions about AI-use (Southworth et al., 2023). 4 key factors for this are (1) knowledge of the basic functioning of AI (referring to machine learning and algorithms), (2) knowledge of how to apply AI to attain goals, (3) knowledge of the reliability of AI and how to assess the quality of outputs, and (4) an understanding of social, ethical and moral consequences of AI-use (Southworth et al., 2023). It has been recommended that universities invest in training the teaching faculty on AI-supported teaching and learning to better help students meet the digital literacy requirements above (Elkhodr et al., 2023; Firat, 2023b; Fuchs, 2023; Tlili et al., 2023). Moreover, students would also need behaviour guidelines and ethical policies in addition to competency training (Bitzenbauer, 2023; Neumann et al., 2023; Rudolph et al., 2023; Sullivan et al., 2023).

A critical remark is that students were usually excluded from contributing to this topic. Most recommendations were based on professional opinions and did not consider what resources students truly wanted, how they would prefer to receive these, and their desired format for building digital competencies, as this may also vary dependent on the academic level and goals.

Social Influence (SI)

SI is the extent to which a person assesses the opinions of significant others regarding use of a technology (social norms) (Venkatesh et al., 2003). According to Venkatesh et al. (2003), this directly impacts behaviour intention and can be moderated by an individual's experience with and voluntary willingness to use technology. Strzelecki (2023) reported this factor as having a low, non-significant impact on behaviour intention. Their argument for this finding was attributed to

the timing and novelty of the AI tool (ChatGPT) which had not yet gained widespread attention and consideration for adoption. Chatterjee & Bhattacharjee (2020) excluded this factor from their study with the reason being that the decision for AI-adoption could not be influenced by society. However, as flagged by both Hasija & Esper (2022) and Strzelecki (2023), this factor should be explored within the context of impacted setting. To explain, stakeholders in the educational setting are students, lecturers, and the institution itself, and they form the social context for AI exploration in higher education (Ali et al., 2023; Chiu et al., 2023; Strzelecki, 2023).

Social resistance to AI-integration has mostly come from educators and academics due to a variety of reasons, namely, risk of plagiarism, excessive dependency, questionable academic integrity, transfer of responsibility, and difficulty validating the learning experiences of students (Firat, 2023a; Halaweh, 2023; Kalla & Smith, 2023). On the other hand, social acceptance was reported to be higher amongst students as they did not consider AI as big a threat to their learning outcomes (Dongmo et al., 2023; Firat, 2023a; Shoufan, 2023). Their concerns rather encompassed academic fairness, especially when evaluating digital literacy and comparing performance based on use or non-use of AI (Firat, 2023a; Shoufan, 2023). It was recommended that both lecturers and students be involved in structuring AI-integration to address preferences and unique needs (Firat, 2023b; Fuchs, 2023). Furthermore, stronger social support and encouragement to use AI tools should be offered by teachers and educational institutions (Elkhodr et al., 2023; Firat, 2023b; Shanto et al., 2023).

Dwivedi et al. (2023) and Southworth et al. (2023) introduced an interesting perspective that suggested employers as a possible social influence. Their argument was that university curricula are typically aligned with the needs of the professional world. Students are equipped with relevant knowledge and necessary skills to ensure employability after graduation. They

suggested that the current AI-digital gaps should influence the decision to prepare students to fill these.

This raises the question of whether employers truly have an influence on the topic of AI-integration and whether students and lecturers considered AI-integration relevant for the professional setting. One may also ask to which extent varying significant others influence students' perspectives on AI-integration and how this varies across different academic levels.

Perceived Impact of AI-Integration on Learning Outcomes

It was found that students were generally accepting of AI-integration for their academic activities (Ali et al., 2023; Strzelecki, 2023; Yilmaz et al., 2023). The most significant benefit of AI-integration in higher education pertains to written assignments and research-related activities like summarisation of literature reviews (Cotton et al., 2023; Firat, 2023b; Rudolph et al., 2023). Notwithstanding, there are conflicting viewpoints from both students and lecturers on the impact of AI-integration on learning. Some studies suggested that the use of AI for academic activities could positively impact students' skills such as creativity, critical thinking, problem-solving, writing, productivity, and teamwork (Cotton et al., 2023; Neumann et al., 2023; Qadir, 2022; Southworth et al., 2023). A great potential was furthermore indicated to enhance performance, increase motivation and engagement with learning content, improve deep learning, support application of new concepts, customise and track own learning progress, and overall enhance learning experiences (Bitzenbauer, 2023; Cotton et al., 2023; Fauzi et al., 2023; Southworth et al., 2023; Tajik & Tajik, 2023). Other studies disagreed, suggesting that using AI would negatively impact critical thinking, problem solving, communication, performance, and general learning outcomes (Burkhard, 2022; Fuchs, 2023; Rudolph et al., 2023; Sullivan et al., 2023). Additionally, there was the concern that through AI-use, students risked violating academic integrity through

acts of plagiarism, cheating, and submitting assignments done without own effort (Cotton et al., 2023; Dwivedi et al., 2023). Moreover, inequities could easily arise based on access to AI tools, digital competency, and the unfair advantage some students may have over those who do not use AI (Cotton et al., 2023). Regardless of the divide, there is a consensus that AI-integration would need to be guided (Burkhard, 2022; Shoufan, 2023; Tajik & Tajik, 2023).

Perceived Impact of AI-Integration on Performance Assessment

Introducing AI led to a further dilemma pertaining the assessment of performance. This spurred discussions on whether performance evaluations should move from written assessments to other forms such as oral or hand-written examinations, presentations, lecture attendance and group work, as such assignments could not be outsourced to AI and would better assess what students have learned (Cotton et al., 2023; Rudolph et al., 2023; Sullivan et al., 2023). Other opinions contradicted this, indicating that this change was unnecessary, especially taking into account the importance of graduate employability and the need to equip students with AI-relevant skills (Neumann et al., 2023; Qadir, 2022; Rudolph et al., 2023). Citing Sullivan et al. (2023), the writing and the learning processes are deeply interconnected and thus should not be excluded based on the perceived threats of AI-integration the other academics pointed out. Their further justification for the use of AI for written assignments is that it afforded students the opportunity to develop higher-order skills and improve digital literacy. Other studies supported this argument by suggesting that integrating AI in written assignments would enable students to learn through experimentation, enhancing their experience and challenging them to evaluate alternative approaches to problem-solving, collaborative work, and achieving goals, preparing them for real-world scenarios (Dongmo et al., 2023; Neumann et al., 2023; Qadir, 2022; Tajik & Tajik, 2023). Despite this, Burkhard (2022) argued that the likelihood of students executing a copy-paste

approach would negatively impact the shaping and testing of these competencies, affecting students' ability to present arguments. Moreover, it was reported that a great challenge for lecturers would be to differentiate between what was written by students and content generated by AI (Cotton et al., 2023). The effort invested by the students would not be easily assessable, making it hard to determine a student's level of understanding of learning content (Cotton et al., 2023). This drives the fear that AI-integration could potentially undermine both the purpose of education which is to challenge students to develop necessary skills and the value of degrees awarded at the end of the academic program (Cotton et al., 2023).

Amani et al. (2023) suggested that the impact of AI-use on skills and attitudes namely critical thinking, problem solving, teamwork, self-efficacy, test anxiety, performance, intrinsic motivation, and engagement would need to be evaluated on a longitudinal basis to better the kind of impact AI-use has on them. Ultimately, both AI-integration and change of assessments would be costly in terms of time and increased workload burden on educators and institutions (Neumann et al., 2023). To ensure success in this area, it was suggested that concerns be first acknowledged and differing opinions invited to discuss possible solutions, followed by clear communication of decisions to avoid contradictory expectations and ensure heterogenous guidelines and regulations for all stakeholders (Neumann et al., 2023). Likewise, addressing these factors would contribute to understanding how to strike a balance between traditional assessment methods and AI-supported learning and performance (Shanto et al., 2023).

Other Concerns

Resistance to AI-integration has also been attributed to the fear of the unknown, a feeling of loss of control, and general mistrust for AI tools (Dwivedi et al., 2023). The unpredictable and uncertain innovation potential of these tools was deemed challenging (Neumann et al., 2023).

Some students raised concerns about data privacy and a sense of insecurity while using AI, especially as there was no transparency on how data was stored and used (Firat, 2023a; Kalla & Smith, 2023; Shoufan, 2023). Fears were also expressed concerning employability if students did not have AI-relevant skills, job replacements by AI in certain fields, and reduced need for lecturers (Dwivedi et al., 2023; Farhi et al., 2023). Some students were concerned about the misuse of AI, especially when the benefits outweighed the costs (Burkhard, 2022). It was considered a challenge to constantly determine when AI should be utilized for productivity without compromising the human and social elements of learning (Dai et al., 2023). In essence, Farhi et al. (2023) determined it critical to understand students' concerns regarding AI-integration as ethical dilemmas could lead to dissatisfaction with the educational institution. Knowing and addressing these could better facilitate digital transformation (Dwivedi et al., 2023; Farhi et al., 2023).

Case Studies: AI-Integration in Different Academic Settings

Very few studies have investigated the impact of AI-integration on the perspectives and behaviour of students and teachers. 4 cases are reviewed below.

In their pilot study, Bitzenbauer (2023) focused on determining the initial experiences of German high school students after integrating AI in a physics classroom. Their interest was to uncover the impact of guided experience on the students' perceptions of AI (ChatGPT). They designed two interventions with two main activities, one requiring the students to evaluate the AI's outputs related to a previously learned topic and discuss those outputs using a think-pair-share approach, and another requiring them to create a survey using AI by determining appropriate prompts, crosschecking the informational validity, reviewing the outcomes, and discussing in plenum. The pre- and post-test evaluations ultimately revealed that the interventions impacted the students' perceptions as they experienced the benefits firsthand. It was concluded

that with sufficient guidance from teachers AI could complement and enhance learning experiences while building critical thinking and problem-solving skills.

Findings from Shoufan (2023) complemented this outcome as it was determined that the positive experiences while using AI increased students' subsequent use of AI. In their study, senior computer engineering students first evaluated the selected AI tool (ChatGPT) post-completion of a learning activity, then after 3 weeks of further experimentation with the tool for other activities, completed a survey developed from the initial evaluations. The outcome revealed that the students found the tool beneficial, user-friendly, and motivating. The human-like interface enhanced their experience, and despite the challenges such as the accuracy of outputs, most students were optimistic about the future development and improvement of AI. There was a divide concerning the impact of use on learning, academic integrity and professional careers, but a consensus was reached on the need for guidance and the general involvement of lecturers for efficient integration. Students expressed awareness that AI was not a replacement for own intelligence.

A pre- and post-test study conducted by Elkhodr et al. (2023) involving ICT students at the bachelor and master levels revealed that although students from both levels found AI (ChatGPT) helpful, the master students did not find it as enjoyable as bachelor students and indicated a lower reliance. Whereas the bachelor students were generally positive about the impact of use on learning outcomes, the master students expressed mixed feelings. On an interesting note, students who had used AI generally produced better quality work and indicated better understanding of the learning material as compared to the work of those who preferred non-AI-use. In essence, it was reported that AI-integration should be customized for each level based on the specific contexts, goals, and needs.

As a final case, Dai et al. (2023) conducted a study with 20 Australian postgraduate students within the disciplines of humanities, social sciences, and STEM[4], who had at least 4 months' worth of tailored experience with AI (ChatGPT) within the scope of each student's research process. They each instructed the tool to model scholarly practices and function as academic researchers in the respective disciplinary fields, establishing a goal-oriented collaboration. Additionally, the AI tool was assigned tasks as both a peer reviewer and supervisor, providing the students with a better understanding of what kind of expectations the academic community held regarding the evaluation of research work. They reported numerous positive impact points which spun across research activities, personal development, and supervision.

Gaps and Other Findings

Starting with the gaps, these studies all focused on ChatGPT alone. Very few studies have looked at other AI tools such as Google Bard and Microsoft Bing (Copilot) (Bubaš et al., 2024; Shanto et al., 2023). Aside from the discipline-inclusive approach of the study by Dai et al. (2023), most studies focused on more technical disciplines (STEM). Barely any research has been reported in the field of psychology (Uludag, 2023). While the strength of the study by Dai et al. (2023) lay in the inclusivity of disciplines with student-led research, the critique is that participants were already at a level with comparatively more research and possibly professional experience. Hence familiarity with research activities and processes would be much higher for them than for students at the bachelor or master's level. On a last note, there was no indication of

[4] Science, Technology, Engineering and Mathematics

the support teachers themselves required to be able to support the students with AI-use. These gaps were integrated in the goals of this thesis.

These case studies have nonetheless provided many insights into actual AI-integration, something most studies have not implemented, only recommended (Dongmo et al., 2023; Farhi et al., 2023; Neumann et al., 2023; Strzelecki, 2023). Their insights related to PE and EE are not presented here due to earlier coverage of these factors in this chapter.

The most significant concern of students in these studies was over-reliance on AI and the possibility of losing first-hand processing experiences such as comprehension and written communication (Dai et al., 2023; Shoufan, 2023). Students and lecturers acknowledged that AI-use could both develop and undermine critical thinking and problem-solving skills if not guided by lecturers (Bitzenbauer, 2023; Dai et al., 2023; Elkhodr et al., 2023; Shoufan, 2023). Regarding challenges with the authenticity and accuracy of the generated outputs, the postgrad students adapted strategies to counter these, for example, the search for resources and literature was handled by the students themselves and when aided by AI, they cross-validated the source credibility (Dai et al., 2023). On the other hand, routine and technical tasks were quickly resolved as AI provided shorter feedback loops, thereby accelerating and advancing progress, supporting autonomy, shaping the use of scientific language and logic, and increasing confidence and engagement with the subject matter (Dai et al., 2023; Elkhodr et al., 2023; Shoufan, 2023).

In the research setting, students were able to conduct mock interactive rehearsals, anticipate possible critiques and counterarguments to challenge their own logical reasoning and continuously reiterated various research steps when and where necessary (Dai et al., 2023). Feedback provided by AI “acting” as a supervisor was considered trustworthy, fair, and not influenced by biases such as supervisor preferences or emotional state of being (Dai et al., 2023).

When it came to the impact on supervision, AI granted the students more independence for technical tasks and they instead relied on supervisors for strategic guidance regarding the big picture, which made interactions more efficient (Dai et al., 2023). With students having taken more ownership of their research, supervisors were able to delve into the students' capabilities and challenges and offered stronger support for intellectual growth and social and emotional reinforcement (Dai et al., 2023).

On the whole, the use of AI was enhanced by own experimentation and receiving tailored guidance (Bitzenbauer, 2023; Dai et al., 2023; Elkhodr et al., 2023; Shoufan, 2023). This subsequently impacted the perspectives of both students and teachers on AI-integration.

In conclusion, there are many things to keep in mind to facilitate the integration of AI in higher education. Based on this literature review, many topics overlap and cannot be completely isolated when trying to understand what could positively or negatively impact the perspectives of students, with experience being an essential factor. There is a need to further explore and measure the actual impact of integration on the perceptions of psychology students and lecturers from different academic levels, as these insights could shape future approaches for AI-integration within the discipline. Moreover, these perspectives should include more AI tools as a variety of tools can meet different needs within the academic context. These were the aims of this thesis.

CHAPTER 3: METHODOLOGY

This chapter presents the research approach for this thesis, thoroughly exploring the background and various elements underlying the chosen approach. It includes descriptions of the participants, materials used, and procedure.

Participants

The target group for this thesis included students and lecturers from the School of Applied Psychology at the University of Applied Sciences and Arts Northwestern Switzerland. This included first-year bachelor (BSc) students from both the Occupational, Organisational and Personnel Psychology (AOP[5]) and Business Psychology (WP[6]) programs who partook in a mandatory introductory seminar, master (MSc) students from both the Occupational, Organisational and Personnel Psychology and Business Psychology programs who partook in a research workshop focused on AI-integration, continuing education students from the Certificate of Advanced Studies (CAS) Basic Psychology[7] program, continuing education students from the Master of Advanced Studies (MAS) Applied Psychology for the World of Work[8] program, and lecturers who taught one or more of the academic levels listed above. The 4 academic levels were further categorized into 2 groups, Formal Education Programs (BSc and MSc) and Continuing Education Programs (CAS and MAS), based on the structure and aims of both groups of programs and the level of academic and professional experience typically represented within both groups.

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[5] Arbeits-, Organisations- und Personalpsychologie
[6] Wirtschaftspsychologie
[7] Grundwissen Psychologie
[8] Angewandte Psychologie für die Arbeitswelt

A combination of stratified random sampling and self-selection sampling were used as the 4 academic levels and lecturers represented different sub-units of the population (Kuckartz, 2014). This meant that although students and lecturers within each stratum were invited to participate, they voluntarily chose to participate in the survey and/or signed up for the subsequent interviews (Sharma, 2017). For these interviews, an overall sample size of 15 participants was deemed appropriate as value was placed on multiple in-depth perspectives from each stratum (Boddy, 2016; Creswell & Plano Clark, 2007). Lecturers were however excluded from the interviews as the topics covered through the survey sufficed. The BSc level was sampled twice due to the use of pre- and post-assessments. The 3 other levels were sampled once at the end of their respective interventions. The individual settings for each level are explained further in the *Research Design*.

68 participants from the BSc level responded to the first survey at the beginning of the introductory seminar. The average age was 24.01 years. 67.6% identified as female and 32.4% as male. Most of the responses came from participants studying AOP on a part-time basis (35.3%) and from participants in seminar group B (27.9%). 51 participants from the same level took part in the second survey at the end of the semester. The average age was 24.92 years. 64.7% identified as female, 33.3% as male and 2% as diverse. Most of the responses came from participants studying AOP on a part-time basis (47.1%) and from participants in seminar group E (23.5%). Tables 1 and 2 provide an overview of the demographic frequencies and statistics.

Table 1

Survey Demographics: BSc Participants

Characteristic	Test			
	Pre-assessment (n = 68)		Post-assessment (n = 51)	
	n	%	n	%
Gender				
Female	46	67.6	33	64.7
Male	22	32.4	17	33.3
Diverse	-	-	1	2.0
Age Group				
Under 20	2	3.0	1	2.0
20 – 24	45	67.2	29	56.9
25 – 29	12	17.9	13	25.5
30 – 39	7	10.4	8	15.7
40+	1	1.5	-	-
Program				
AOP Full-time	23	33.8	12	23.5
AOP Part-time	24	35.3	24	47.1
WP Full-time	9	13.2	6	11.8
WP Part-time	12	17.6	9	17.6
Seminar Group				
A	15	22.1	9	17.6
B	19	27.9	11	21.6
C	12	17.6	10	19.6
D	15	22.1	9	17.6
E	7	10.3	12	23.5

Note. One participant from the pre-assessment did not provide their age.

Table 2

Age per BSc-Test

	n	*M*	*SD*	min	max
BSc pre-assessment	67	24.01	4.45	19	40
BSc post-assessment	51	24.92	4.76	19	39

Note. One participant from the pre-assessment did not provide their age.

A total of 84 participants across all 4 levels responded to the respective surveys at the end of the respective interventions. The average age of these participants was 31.52 years with the minimum age being 19 years and the maximum 59 years. Most participants identified as female (69%). 65.5% of the participants were in a Formal Education Program (BSc and MSc) and 34.5% in a Continuing Education Program (CAS and MAS). Tables 3, 4 and 5 provide an overview of the demographic statistics and frequencies.

Table 3

Age per Level and Group

	n	*M*	*SD*	min	max
Level					
BSc	51	24.92	4.76	19	39
MSc	4	28.50	4.04	25	34
CAS	18	43.28	8.94	29	59
MAS	10	45.20	9.05	32	55
Group					
Formal Education Program	55	25.18	4.78	19	39
Continuing Education Program	28	43.96	8.56	29	59
Total	83	31.52	10.99	19	59

Note. One CAS participant did not provide their age.

Table 4

Survey Demographics: All Levels Post-assessment

Characteristic	BSc (n = 51)		MSc (n = 4)		CAS (n = 19)		MAS (n = 10)	
	n	%	n	%	n	%	n	%
Gender								
Female	33	64.7	3	75.0	13	68.4	9	90.0
Male	17	33.3	1	25.0	5	26.3	1	10.0
Diverse	1	2.0	-	-	1	5.3	-	-
Age Group								
Under 20	1	2.0	-	-	-	-	-	-
20 – 29	42	82.3	3	75.0	1	5.6	-	-
30 – 39	8	15.7	1	25.0	4	22.2	3	30.0
40 – 49	-	-	-	-	9	50.0	3	30.0
50+	-	-	-	-	4	22.2	4	40.0
					BSc & MSc Total (n = 55)			
Program					n		%	
AOP Full-time	12	23.5	-	-	12		21.8	
AOP Part-time	24	47.1	1	25.0	25		45.5	
WP Full-time	6	11.8	-	-	6		10.9	
WP Part-time	9	17.6	3	75.0	12		21.8	

Note. The AOP and WP programs were only applicable at the BSc and MSc levels.

Table 5

Survey Demographics: Groups

Characteristic	Formal Education Programs (n = 55)		Continuing Education Programs (n = 29)		Total (n = 84)	
	n	%	n	%	n	%
Gender						
Female	36	65.5	22	75.9	58	69.0
Male	18	32.7	6	20.7	24	28.6
Diverse	1	1.8	1	3.4	2	2.4
Age Group						
Under 20	1	1.8	-	-	1	1.2
20 – 29	45	81.8	1	20.5	46	55.4
30 – 39	9	16.4	7	19.3	16	19.3
40 – 49	-	-	15	14.5	12	14.5
50+	-	-	8	9.6	8	9.6

A total of 15 interviews were conducted with participants across the 4 levels. 66.7% of them were from the formal education programs. 80% of the participants identified as female, and 60% were within the age range of 20 to 29 years. The average age of all participants was 31.80 years. Tables 6 and 7 provide an overview of the demographic statistics and frequencies.

Table 6

Age of Interviewees

	n	*M*	*SD*	min	max
Formal Education Program	10	25.10	5.17	21	39
Continuing Education Program	5	45.20	7.60	33	55
Total	15	31.80	11.26	21	55

Table 7

Interview Demographics

Characteristic	n	%
Group		
Formal Education Program	10	66.7
Continuing Education Program	5	33.3
Gender		
Female	12	80.0
Male	3	20.0
Age Group		
20 – 29	9	60.0
30 – 39	2	13.3
40 – 49	2	13.3
50 – 55	2	13.3

8 lecturers took part in the survey. 50% identified as male, 37.5% as female and 12.5% as diverse. The average age was 48.57 years, with most of the participants within the age range of 45 to 54 years (42.8%). Most responses came from participants who taught at either the MSc AOP or CAS levels (62.5% each) or both. Some lecturers taught at more than one academic level, but none at the MAS level. Tables 8 and 9 provide an overview of the demographic statistics and frequencies.

Table 8

Age of Lecturers

	n	*M*	*SD*	min	max
Lecturers	7	48.57	8.14	36	58

Table 9

Survey Demographics: Lecturers

Characteristic	n	%
Gender		
Female	3	37.5
Male	4	50.0
Diverse	1	12.5
Age Group		
35 – 44	2	28.6
45 – 54	3	42.8
55 – 60	2	28.6
Program		
BSc AOP	4	50.0
BSc WP	3	37.5
MSc AOP	5	62.5
MSc WP	3	37.5
CAS	5	62.5
MAS	-	-

Materials

Surveys containing open- and closed-ended questions were created and administered across the 4 academic levels and to lecturers (See Appendix A). For the pre-assessment survey at the BSc level, questions based on the following AI tools were asked: ChatGPT, AI Writer, Elicit, Research Rabbit, Sci Space, Copilot, and GPTZero. However, the training inputs were adjusted to focus on the following AI tools: ChatGPT, Consensus AI, Research Rabbit, SciSpace, Litmaps, DeepL Write, Microsoft Bing, and Google Bard. These were adopted accordingly in the post-assessment survey for the other 3 levels for easier comparison across the levels. The online software survey tool Tivian (survey.fhnw.ch) was used for data collection.

The topics explored through the surveys were selected based on a combination of factors. The UTAUT model served as a governing framework from which its broader topics, for example facilitating conditions, were adapted to generate open-ended questions for the survey and interview. Furthermore, some questions were adapted from other studies, for example perceived impact of AI on selected academic domains, while other questions were generated based on underlying themes presented in a variety of literature, for example perceived benefits and concerns regarding AI use (Amani et al., 2023; Burkhard, 2022; Firat, 2023b; Suh & Ahn, 2022).

The questions in the surveys were presented in blocks. On the topic of *Experience*, questions were asked on a range of AI tools, including which were known/used, reasons for use/discontinued use/non-use, frequency of use on a 7-point scale (*never, once a month, many times a month, once a week, many times a week, once a day, many times a day*), and rating of selected tools on a 5-point scale (1- *very bad* to 5- *very good*). On the topic of *Perspectives*, questions were asked on confidence of use on a 5-point scale (1- *very uncertain* to 5- *very certain*), what the tools could be used for academically, level of acceptance of use on a 5-point scale (1- *disagree completely* to 5- *agree completely*), concerns, and perceived benefits and challenges. On the topic of *Preferences*, a question was asked on preferences for human assistance over AI-support for a range of academic activities. On the topic of *Impact on Education*, a question was asked on expected type of impact on a list of academic behaviours and skills on a 5-point scale (1- *very negative impact* to 5- *very positive impact*). On the topic of *Knowledge Relevance for Work*, questions were asked on the level of agreement on a 5-point scale (1- *disagree completely* to 5- *agree completely*) and reasons for selected response. On the topic of *Training*, questions were asked on desired training content and satisfaction with training on a 5-point scale (1- *disagree completely* to 5- *agree completely*).

The survey for lecturers contained questions also presented in blocks. On the topic of *Experience,* the questions were the same as above. On the topic of *Perspectives on Student-use*, questions were asked on level of acceptance on a 5-point scale (1- *disagree completely* to 5- *agree completely*), academic activities that could be supported by AI, concerns and perceived benefits, expected type of impact on a list of academic behaviours and skills on a 5-point scale (1- *very negative impact* to 5- *very positive impact*), necessary ethical guidelines for use, level of agreement with knowledge-relevance for work on a 5-point scale (1- *disagree completely* to 5- *agree completely*), AI- relevant skills and knowledge, and expected impact on learning outcomes on a 5-point scale (1- *very negative impact* to 5- *very positive impact*). On the topic of *Perspectives on Lecturer-use*, questions were asked on how AI supported work, which and how AI tools could support the planning and structuring of courses, whether this collaboration was current or planned, and the kind of training/information needed for AI-integration.

Interview guides for the interviews were designed based on exploratory topics and were slightly adapted according to the statistical outcomes per academic level to gain some explanatory insights on those outcomes (See Appendix B). They consisted of questions presented under the following blocks: *Knowledge of AI tools* (current thoughts on AI, knowledge of pros/cons, interesting/challenging aspects), *Experience during the previous semester* (change in attitude, collaboration with AI, challenges with learning how to use AI, expectations, use of AI for other assignments), *Perceived impact* (rating of self-competence, perceived benefit of AI integration for all students, concerns with integration, reaction to quotes from open-ended survey), *Relevance* (perceived relevance for field of study, impact of future development of AI, reaction to quote from open-ended survey), *Perspective on quantitative results* (perceived confidence in own use of AI for study program, acceptance of integration AI in study program, perceived relevance of AI-

knowledge for work, preference for human assistance over assistance through AI, perceived impact on academic skills and competencies), and *Recommendations* (further support required for AI integration, learning format to support AI integration, required skills and knowledge to develop for AI integration). Microsoft Teams was used for conducting and recording the interviews. It also generated automatic transcriptions during the interviews. To further refine these transcriptions, both Microsoft Word and the MAXQDA software were used. DeepL Translator was used as an assistive tool in cross translating some portions of text from German to English.

The MAXQDA software and Statistical Package for the Social Sciences (IBM SPSS) were used for the analysis of the qualitative data and quantitative data respectively.

Procedure

This section presents the research design including the settings participants were assigned to and how the data was collected and subsequently analysed.

Research Design and Data Collection

Most studies sought to quantify attitudes towards AI integration and determine predictors of intention to use and/or use behaviour. Whereas a few studies explored the general opinions of students without the experience of AI-integration, even fewer explored students' perspectives post-integration of AI (Amani et al., 2023; Burkhard, 2022; Dai et al., 2023; Shoufan, 2023; Strzelecki, 2023; Suh & Ahn, 2022; Yilmaz et al., 2023). In most studies, the measures could not provide insights on what perspective shifts occurred after guided use of AI for academic assignments. These shifts explored within this thesis included reasons for use, non-use, and discontinued use, perceived digital competency, and support preferences, topics not accounted for by other studies. Furthermore, how students desired or expected AI-integration remained unknown. It was recommended that the impact of AI-integration should be explored with different

components in mind, namely cognitive- which included the perceived relevance of AI-knowledge, behavioural- which included interests, experiences, and digital competencies, and affective- which included the perceived value and impact of AI-integration (Suh & Ahn, 2022). The strategy employed in this thesis ensured questions asked covered these components.

The research questions explored were "What are the perceptions of students after experimenting with AI tools for academic work?" and "What are the perspectives of lecturers regarding integration of AI tools?". The first question was the overarching research question focused on students and included sub-hypotheses focused on change in perceived competence after intervention at the BSc level, human vs AI support preferences for selected academic activities, and relevance of AI literacy for students' careers, as well as further topics to be explored (detailed in *Chapter 1*). The second was a minor research question focused on the opinions of lecturers regarding the integration of AI in the academic setting.

To answer these, a mixed methods exploratory approach involving surveys and interviews was used for this thesis as there was little empirical evidence on the impact of practical implementation of AI-integration, especially within the discipline of psychology (Bitzenbauer, 2023; Shoufan, 2023; Uludag, 2023). The purpose of the surveys was to quantitatively and qualitatively assess and compare the opinions of a wider pool of students from different academic levels on AI-integration. They captured data on demographic characteristics such as age, gender, and academic program, and measured experience (use vs. non-use, type of AI tool, frequency of use, reason for use/non-use/discontinued use, ranking), perspectives, and preferences. It should be noted that there were slight differences in the demographic questions for the respective academic levels. These perspectives included perceived competence, concerns, perceived benefits and challenges, desire for training, amongst others (detailed under *Materials*). The interviews served

as both a deeper exploration of the experiences and opinions of students with respect to AI-integration and a follow-up on selected insights gained from the surveys. Through this, participants were able to reflect on and define their opinions regarding AI-use, present their challenges and needs for support, and explain how and why their attitudes changed or remained the same after their experience collaborating with AI tools.

Through close-ended questions in the survey, the quantitative strand provided quantifiable insights on the perspectives of participants on AI-integration relevant for the hypotheses. This further enabled certain comparisons within the BSc level and across the 4 academic levels. The qualitative strand uncovered various topics relevant to the research questions and revealed factors that impacted AI-integration and needed to be taken into consideration. A few qualitative data points also provided some explanations for the quantitative findings within the same survey. For example, asking students to provide reasons for their answer to certain quantitative questions.

A stronger emphasis was placed on the qualitative aspect of this thesis through the inclusion of open-ended questions in the survey and post-survey interviews. With this strong focus on the descriptive aspect, there was less focus on statistical analyses. Moreover, due to the novelty of the topic, both inductive and deductive approaches were used to compensate for areas that had less empirical background.

As a derivative from the larger FHNW-based project, there were 4 settings attributed to the 4 academic levels in which the interventions (introduction to a selected range of AI tools including their functionalities, limitations, and examples for use) were administered by lecturers and the students were tasked to complete assignments using this knowledge. This thesis utilized this but was not involved in the design of each. Based on the timing of each intervention, the data collection was completed in four phases: a pre-assessment survey involving only participants from

the BSc level, a post-assessment survey involving participants from each level (BSc, MSc, CAS, and MAS), interviews involving participants from each level, and a survey involving lecturers.

At the BSc level, the first-year students were distributed into 5 seminar groups led by 5 different lecturers with the same training content presented during the fall semester. The first phase of data collection was implemented at the beginning of the introductory seminar when they had not yet received the intervention. A 15-minute online survey was sent to the students through their lecturers. As the students were assigned to different seminar groups, the dates of assessment varied. All students who completed the survey after the second class were removed from the data collected as at that point, they had been introduced to the intervention. The students were further divided into subgroups and collaborated on writing and presenting scientific literature work with the assistance of AI tools over the course of the semester[9]. This included literature review, development of the research question, and optimization of written content.

One part of the second phase of data collection was implemented afterwards. This involved a second 15-minute online survey distributed through lecturers to the same BSc students after the submission of their assignment. The other part of the second phase involved students at the MSc, CAS, and MAS levels and followed the same approach. At the MSc level, 5 students participated in a research workshop in which they received the intervention. They were first required to implement the phases of their research project without the assistance of AI tools, then subsequently incorporated the use of AI tools to complete these phases over the course of the semester[10]. This was followed by a self-reflection on their experiences. At the CAS level, students

[9] Approx. 4 months
[10] Approx. 5 months

received the intervention and were tasked with creating learning protocols with or without the use of AI tools. They had to critically reflect on the content generated through AI-collaboration including how this impacted AI-assisted ways of working over the course of the semester[11]. At the MAS level, students received the intervention and were tasked to test and voluntarily use AI tools as aids in the development of research questions, search for literature and standardized questionnaires, development of interview guidelines, and maximization of their writing skills over the course of the semester[12].

The third phase of the data collection utilized recorded interviews to acquire deeper insights into the opinions and experiences of the participants who voluntarily signed-up via the surveys (one participant however directly contacted the author). They were provided the opportunity to select appropriate timeslots and were sent the consent form prior to the interviews. These approximately 30-minute interviews were semi-structured and partially based on the outcomes of each survey. For the interviews with participants from the BSc level, the comparison of the quantitative data points from the pre- and post-assessments were included. Although there was no pre-assessment for the other academic levels, the quantitative data points from the respective post-assessments were nonetheless presented. Participants were invited to provide assumptions on specific quantitative results as well as results they found interesting (Creswell & Plano Clark, 2007), share their own thoughts on and experiences with AI, describe their change in attitude, express their concerns, and determine potential gaps with AI-integration in the academic setting.

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[11] Approx. 6 – 7 months
[12] Approx. 6 – 7 months

The final phase focused on lecturers associated with the various levels. The survey captured demographic characteristics such as age, gender, academic level(s) and program(s) they lectured for, as well as measured experience (use/non-use/discontinued use, type of AI Tool, frequency of use, reason for use vs. non-use, rating) and perspectives on the implications of the integration of AI tools for both students and lecturers. They were asked to indicate their own training needs and ethical factors that needed to be considered.

The variety in settings facilitated a somewhat tailored experience for the participants across each level, as the core focus of their respective academic tasks and level of academic and professional experience differed. Nevertheless, the interventions and respective assignments were in essence all focused on scientific process and academic writing. The pre-post assessment at the BSc level was selected due to the newness of the academic experience for the students. The strength of this research design lay in its wide scope and ability to capture perspectives from students with different levels of experience, academic objectives, and professional goals.

Data Analysis

The SPSS software was used for the analysis of the quantitative data points, which included descriptive statistics, frequency distributions, and group comparisons. Crosstabs were used to determine all data frequencies with bar charts utilized as visual aids. For the pre- and post-assessment at the BSc level, the Mann-Whitney U test was used to determine if differences between the responses of both assessments were significant. This test was also used to determine if differences between the responses of participants from the further education and the continuing education programs were significant. Non-parametric tests were conducted as the samples violated the assumptions of equal variance and normality. These violations were confirmed using the Levene's test, the Kolmogorov-Smirnov test, and the Shapiro-Wilk test.

The qualitative data points were presented in two formats, open-ended text from the surveys and video recordings from the interviews. The interviews were conducted via Microsoft Teams which provided an automatic transcription of each conversation. The MAXQDA software was used for the analysis of all qualitative data. Thematic content analysis was used to iteratively segment and code the data based on both predefined and emerging themes (Firat, 2023a; Kuckartz, 2014). Initial codes were generated based on individual words and word combinations and were categorized under the topics in the surveys to enhance familiarization with the content. Visual word clouds were generated to determine frequently occurring words under each topic, but these were not used. The data was subsequently segmented into larger themes, namely *Motivations for Integration*, *Barriers to Integration*, *Knowledge Relevance for Professional Career*, and *Training Needs.* This revealed broad patterns which after review needed refinement. The final differentiation was done with the theoretical framework in mind and better suited the thematic patterns, indicating a deductive approach. Content that did not fit the framework were categorized under the theme they initially represented in the survey, indicating an inductive approach. The final thematic categories were *General Use of AI, Effort Expectancy*, *Performance Expectancy*, *Facilitating Conditions*, *Social Influence*, *Acceptance of Integration and Change in Attitude*, *Concerns about Integration*, and *Perceived Impact of Integration*. There were further subthemes for some of them.

Some responses during the interviews were based on quantitative findings from the survey. Initial interpretations and assumptions for those quantitative outcomes were made based on the analysis of data from the interviews, then subsequently connected to findings from the literature review. The data triangulation technique was used to not only integrate other quantitative and qualitative findings that appeared to be thematically connected, but to also connect these to the

theoretical framework and findings from previous studies. Findings that were solely qualitatively explored were reported and cross-analysed with findings from other studies reviewed in *Chapter 2*.

CHAPTER 4: FINDINGS

This thesis sought to answer two research questions. The over-arching question focused on the viewpoints of students and the second question focused on the viewpoints of lecturers. All findings for the overarching research question are first presented, followed by the findings for the sub-question.

Over-arching Research Question

The primary focus of this thesis was to answer the question "What are the perceptions of students after experimenting with AI tools for academic work?". Both quantitative and qualitative data gathered through the surveys and interviews are presented to answer the overarching question focused on students. The results related to the 3 hypotheses are first presented, followed by the other findings categorized based on a combined deductive and inductive analysis.

Hypotheses

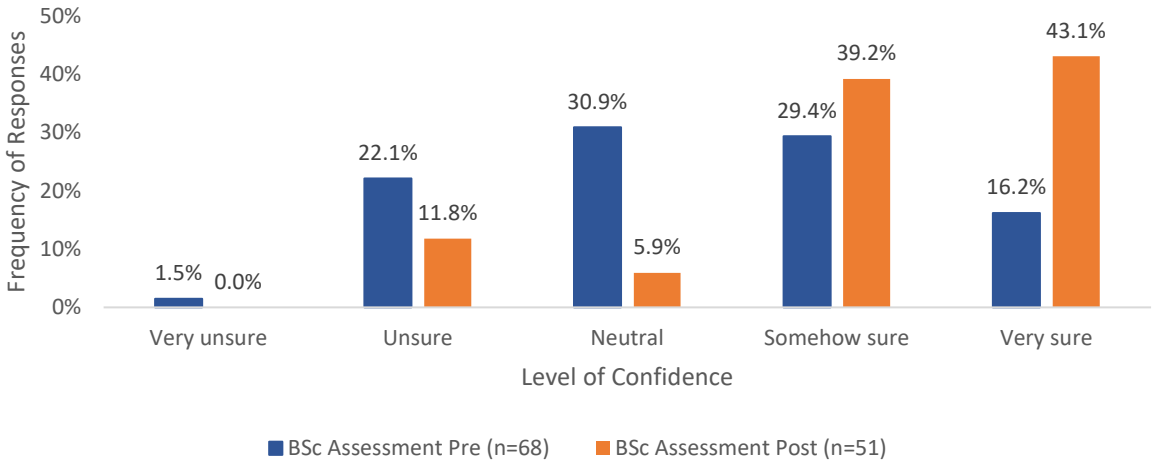
H_1: BSc students will feel more confident about their digital competency after the introductory seminar.

At the start and end of the introductory seminar, participants at the BSc level responded to the question "How confident are you that you can meaningfully use AI tools for your psychology program at the FHNW?".

Quantitative Findings. Frequency distributions were used to evaluate whether responses of the participants differed after the introductory seminar. Figure 1 indicates that the frequencies for the responses *Very Unsure*, *Unsure*, and *Neutral* reduced after the seminar (0, 11.8% and 5.9% respectively), whereas the responses *Somehow Sure* and *Very Sure* (39.2% and 43.1% respectively) increased.

Figure 1

Self-Confidence in Meaningful Use for School



A Mann-Whitney U test was performed to evaluate whether these differences in the responses were significant. Table 10 indicates a significant difference between the responses of the BSc students before (n = 68, mean rank = 49.54) and after (n = 51, mean rank = 73.95) the intervention, $Z = -3.97$, $p < .001$.

Table 10

Self-Confidence in Meaningful Use for School

	Test	N	Mean Rank	U	Z	Sig.
Confidence in Own Use	Pre-assessment	68	49.54	1022.50	-3.97	<.001***
	Post-assessment	51	73.95	-	-	-

Note. *** $p < .001$ (2-tailed)

Qualitative Findings. During the interviews, about 71.4% of the participants rated their competence from a 3 and above out of 5. Participants attributed the variation in quantitative results as well as their current evaluation to the experience gained from the introductory seminar, indicating that the increase in positive responses was due to the familiarization with AI and opportunity to experiment with AI. It was assumed by some participants that prior to the academic start, some students had only used AI for private topics and learnt during the seminar how to use this for research-oriented activities. Some participants attributed neutrality and uncertainty to either struggles some groups may have had or a preference for non-AI-use. One participant shared receiving feedback on whether they were correctly applying AI would have reduced uncertainty.

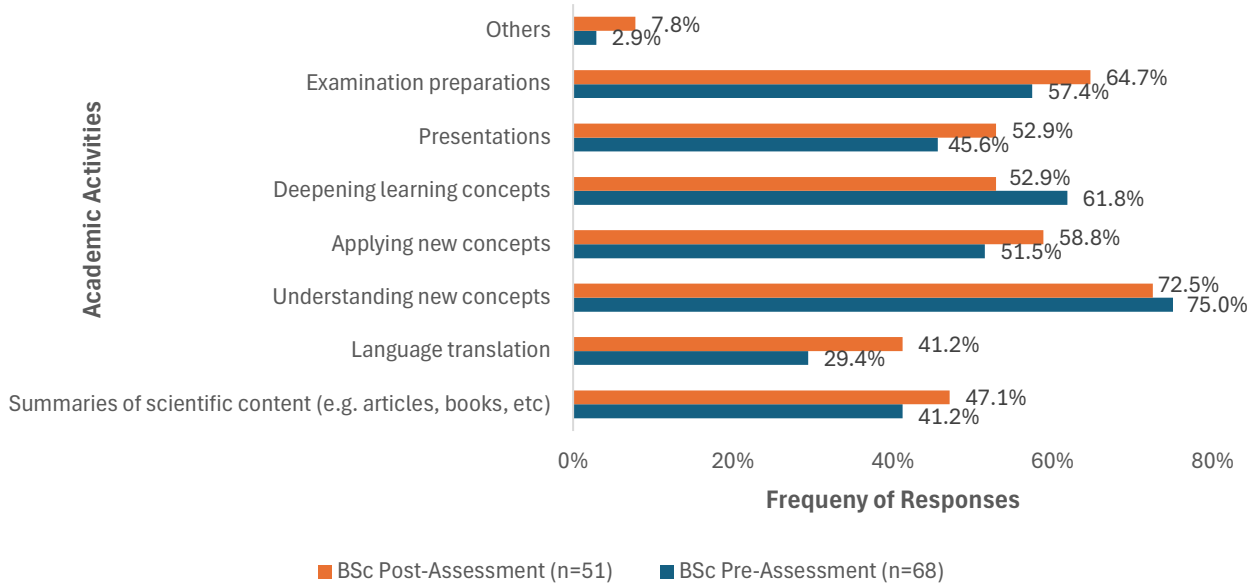
H_2: Students will prefer interactions with people for academic work related to "Understanding New Concepts" and "Presentations".

To answer the question "For which academic-related activities do you prefer support from a human rather than AI tools?", participants indicated their preferences from a range of presented academic activities.

Quantitative Findings. A comparison using frequency distributions was conducted to evaluate whether responses of participants from the BSc level differed after the introductory seminar. Figure 2 indicates the frequency for the responses *Understanding New Concepts* reduced slightly from 75% to 72.5% whereas that for *Presentations* increased from 45.6% to 52.9%. There was also an additional decrease in responses for *Deepening learning concepts* from 61.8% to 52.9% and an increase in the preference for human support for the following academic activities after the seminar: *Summaries of Scientific Content* (47.1%), *Language Translation* (41.2%), *Applying New Concepts* (58.8%), and *Examination Preparations* (64.7%). Participants indicated preference for human-support for more activities after the seminar.

Figure 2

Support Preferences for Academic Activities



Note. Other activities (pre-assessment) included: Ideation, Word Translation.
Other activities (post-assessment) included: Explanation of New Concepts, Review and Rewriting of Text, Steps Writing a Dissertation.

A Mann-Whitney U test was performed to evaluate whether the differences between the responses were significant. Table 11 indicates there was no significant difference between the responses for *Understanding new concepts* before (n = 68, mean rank = 60.63) and after (n = 51, mean rank = 59.17) the intervention, Z = -0.30, p = .764, as well as for *Presentations* before (n = 68, mean rank = 58.13) and after (n = 51, mean rank = 62.50) the intervention, Z = -0.79, p = .429.

Table 11

Support Preferences for Academic Activities

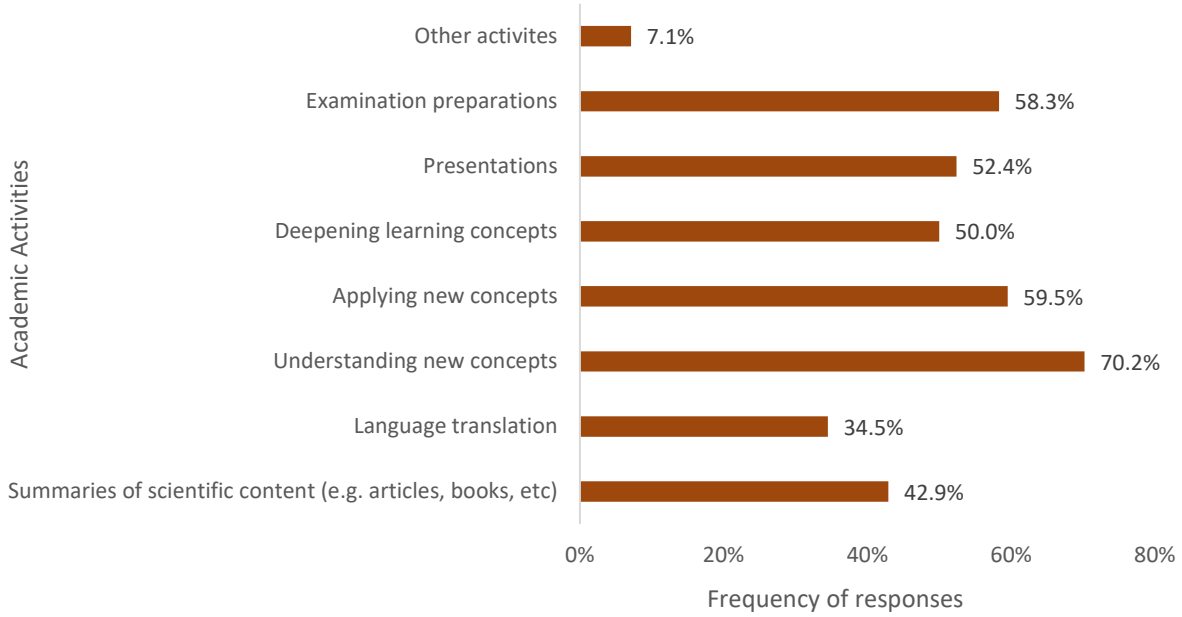
Academic Activity	Test	N	Mean Rank	U	Z	Sig.
Summaries of scientific content (e.g. articles, books, etc)	Pre-assessment	68	58.50	1623.00	-0.64	.524
	Post-assessment	51	62.00	-	-	-
Language translation	Pre-assessment	68	57.00	1530.00	-1.33	.183
	Post-assessment	51	64.00	-	-	-
Understanding new concepts	Pre-assessment	68	60.63	1691.50	-0.30	.764
	Post-assessment	51	59.17	-	-	-
Applying new concepts	Pre-assessment	68	58.13	1606.50	-0.79	.427
	Post-assessment	51	62.50	-	-	-
Deepening learning concepts	Pre-assessment	68	62.25	1581.00	-0.96	.337
	Post-assessment	51	57.00	-	-	-
Presentations	Pre-assessment	68	58.13	1606.50	-0.79	.429
	Post-assessment	51	62.50	-	-	-
Examination preparations	Pre-assessment	68	58.13	1606.50	-0.81	.419
	Post-assessment	51	62.50	-	-	-
Other Activities	Pre-assessment	68	58.75	1649.00	-1.20	.228
	Post-assessment	51	61.67	-	-	-

Note. Other activities included: Ideation, Word Translation, Explanation of new Concepts, Review and Rewriting of Text, Steps writing a Dissertation.

Frequency distributions were used to evaluate the combined responses of participants from the 4 levels after the interventions. Figure 3 indicates the frequencies for the responses *Understanding New Concepts* and *Presentations* (70.2% and 52.4% respectively) were above 50%. Additionally, more than 50% of the participants preferred human support for *Examination Preparations* (58.3%) and *Applying New Concepts* (59.5%).

Figure 3

Support Preferences for Academic Activities



Note. Other activities included: Explanation of New Concepts, Generation of Reports, Steps Writing a Dissertation, Text Review and Rewording, Practical Experience, Literature Research.

Qualitative Findings. Regarding the activity *Presentations*, many participants expressed surprise over the results as they believed AI supported this much better than humans and thus expected lower scores. This same surprise was attributed to the activity *Summarization of scientific content*. For both activities, the results were attributed to the possible complexity of the subject matter being worked on and need for support from other people.

Regarding the activity *Understanding new concepts,* participants attributed the results to the need for guidance from credible subject matter experts as this impacted the learning process, especially with complex topics. This was indicated in conjunction with the activity *Applying new*

concepts. A few participants from the BSc level further indicated that *Deeping of learning* could be done by oneself compared to the other two activities, hence the possible drop in responses after the seminar.

Other results that were of interest to the participants included *Preparation for examinations* and *Language translation*. Surprise was expressed for both outcomes as participants expected a much lower preference for human support for these activities. Participants from the BSc level explained that they believed AI was more convenient for and performed much better with both activities and was labelled as "Google on Steroids" by one participant. Some participants from the other levels were sceptical of how accurate the language translation of AI was and expressed the need to verify the outputs of translated text. As indicated by a participant, "the context could be changed and not noticed by non-native language speakers".

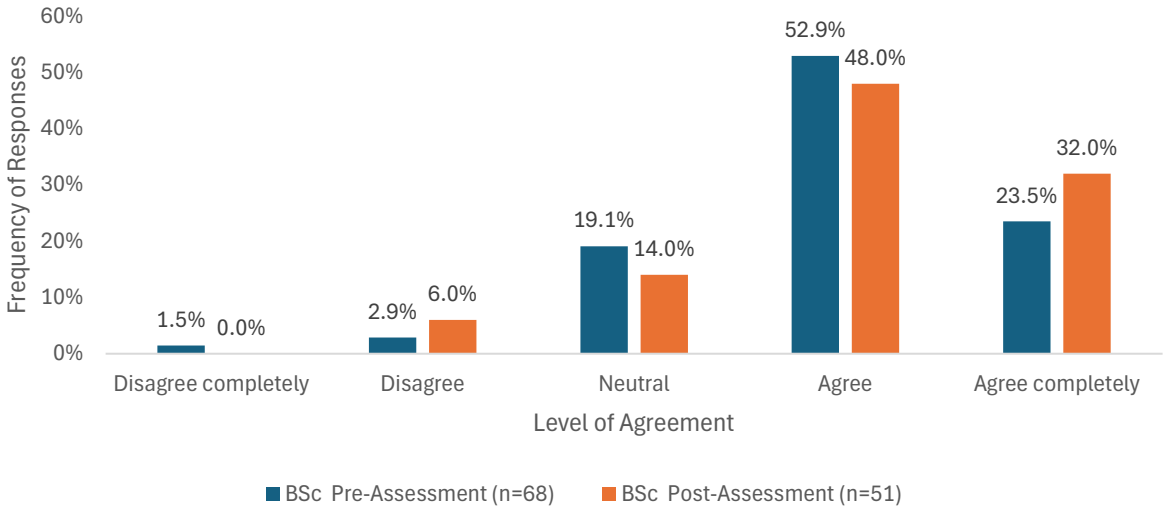
H_3: Students will be interested in acquiring digital competencies for their current/future jobs.

Participants were asked to indicate their level of agreement to the question "Do you believe that knowledge about the use of AI tools will also be useful for your (future) professional activities?".

Quantitative Findings. Using frequency distributions, the responses of participants from the BSc level before and after the intervention were evaluated. Figure 4 indicates an increase for the responses *Disagree* and *Agree Completely* (6.0% and 32.0% respectively) and a decrease in the responses *Disagree Completely*, *Neutral* and *Agree* (0, 14% and 48% respectively) after the seminar.

Figure 4

Knowledge Relevance for Professional Career



A Mann-Whitney U test was performed to evaluate whether these differences were of significance. Table 12 indicates that there was no significant difference between the responses of the BSc students before (n = 68, mean rank = 57.30) and after (n = 51, mean rank = 62.47) the intervention, Z = -0.88, p = .379.

Table 12

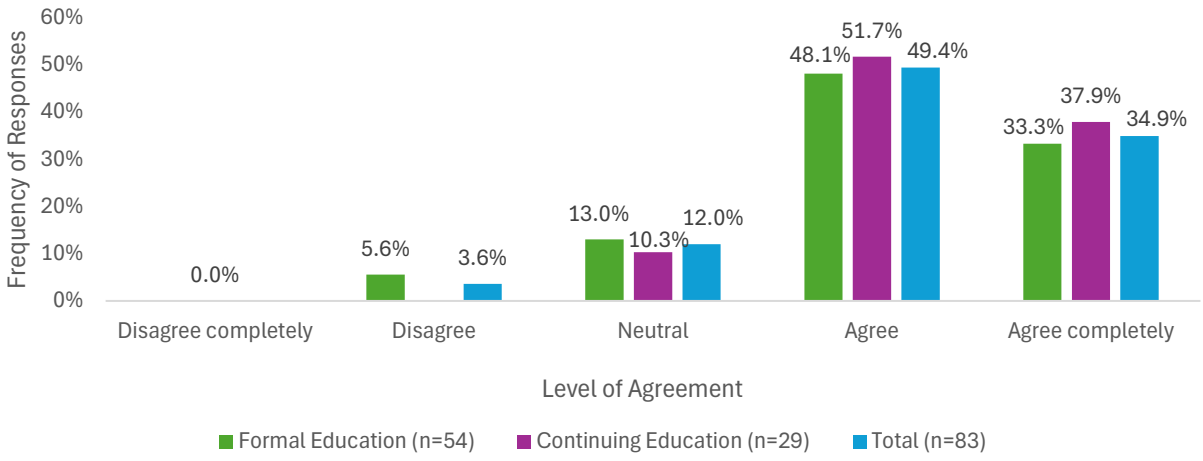
Knowledge Relevance for Professional Career

	Test	N	Mean Rank	U	Z	Sig.
Relevance for current/future job	Pre-assessment	68	57.30	1551.50	-0.88	.379
	Post-assessment	51	62.47	-	-	-

Frequency distributions were used to evaluate whether responses differed between participants in the formal education and the continuing education programs. Figure 5 indicates the frequencies for the responses *Neutral*, *Agree*, and *Agree Completely* differed slightly, with a notable difference for the response *Disagree*. There were no responses under *Disagree Completely* for both groups. A Mann-Whitney U test was performed to evaluate whether the difference in these responses were significant. Table 13 indicates an insignificance in differences between the responses of the formal education students (n = 54, mean rank = 40.58) and the continuing education students (n = 29, mean rank = 44.65), $Z = -0.80$, $p = .424$.

Figure 5

Knowledge Relevance for Professional Career



Note. One participant from the Formal Education programs did not provide a response.

Table 13

Knowledge Relevance for Professional Career

	Group	N	Mean Rank	U	Z	Sig.
Relevance for current/future job	Formal Education	54	40.58	706.50	-0.80	.424
	Continuing Education	29	44.64	-	-	-

Qualitative Findings. At the start of the introductory seminar, participants from the BSc level expressed the importance of context regarding AI-use in a professional setting. Some participants indicated an either positive or negative impact on the topic and others expressed neutrality. One participant stated "I think such tools are the future; their relevance and application possibilities will increase. Therefore, I assume that knowledge and the ability to use them correctly and beneficially can be helpful."

After the introductory seminar, many BSc participants indicated AI-integration was useful for fields and tasks related to human resources, programming, social media, and marketing. Some participants attributed the variation in the response *Disagree* to either the limited knowledge of how these tools could be integrated into the workplace, closed attitude of the students, fear of wrongful application, not seeing the added value, or not seeing further use cases after completion of the seminar assignment. Although a few participants mentioned currently working in areas where AI was not used, they mentioned it was important to learn how to use the tools in preparation for the future.

Participants from both the formal and continuing education programs provided varying responses on their outlook. The current impact of these tools was acknowledged, such as increased efficiency and creativity, support with problem-solving, task simplification, language translation, quicker customer-base management, and reduced work burden. In some cases, participants

actively used AI at the workplace as a support tool. One participant stated “Unfortunately, the workload at work is constantly increasing. AI tools have been used at work since the beginning of 2023. Without these, it becomes difficult to manage the work.” Another participant mentioned that AI-supported efficiency rather increased the assignment of tasks which increased workload.

There was a further acknowledgement of the future impact of AI at the workplace. Participants labelled the topic as unavoidable and mentioned its relevance would increase with the future development of AI. It was stated “In the future, it will certainly be increasingly used in the economy. I think it could be like office programs; one is better off learning how to use them, making it easier in the future.” One participant mentioned that there existed more value for generalists as compared to specialists (defined as subject matter experts).

A concern was raised about the of AI impact on jobs as a participant expressed, “there could be potential job loss as many tasks will be automated and AI will change the economy”. Another participant was concerned about data privacy and whether there was some access to personal data as the AI-generated solutions for work challenges was too closely related to information not provided by the user. Other participants expressed their disinterest in the subject, for example, “I don't want to work in a company that makes decisions based on AI tools. Or I don't want to have any knowledge about it.” Another participant stated, “I hope this will not play a major role, because not everything has to be done with the help of the Internet or AI.”

Further Findings

Analog to the hypotheses above, there were additional quantitative and qualitative findings thematically categorized based on the patterns identified within the content.

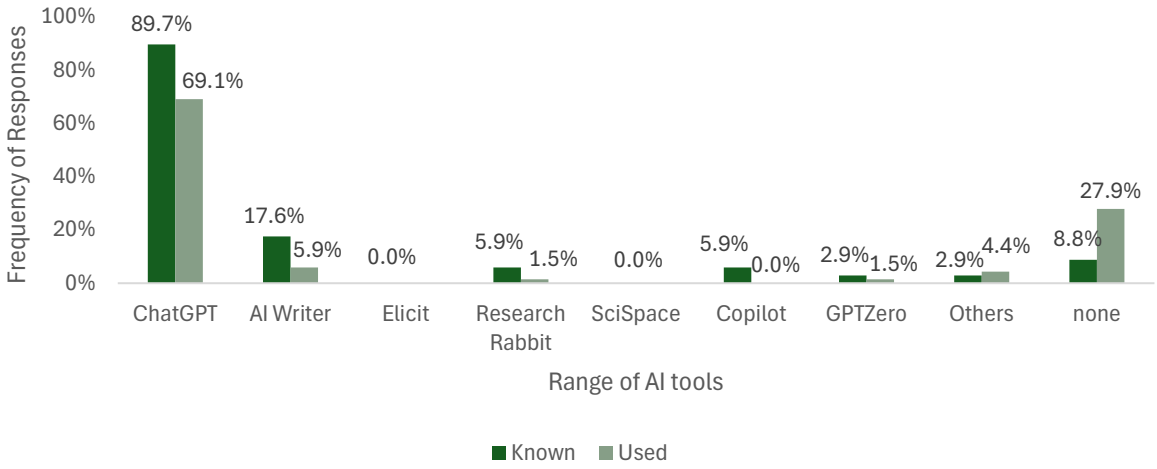
Theme 1: General use of AI Tools

Participants were asked various questions about their use of AI, including which tools were known and/or used, the frequency of use of selected tools, and rating of tool-usefulness.

Quantitative Findings. Frequency distributions were used to evaluate responses of participants from the BSc level to the question "Which of the following AI tools do you know and/or have you used?" at the beginning of the introductory seminar. Figure 6 indicates *ChatGPT* was the most popular AI tool as 89.7% of the participants knew about it and 69.1% of them had used it before. *AI Writer* was the second highly known tool (17.6%). The second highest response to the question on used tools was *None* (27.9%).

Figure 6

Known and Used AI Tools

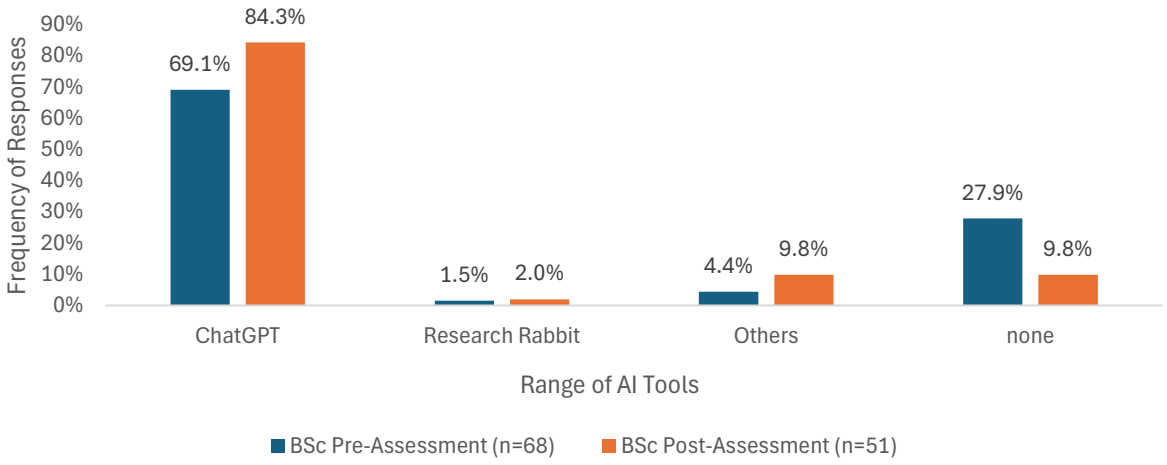


Note. Others included: Canva AI Image Creator, Claude.

Using frequency distributions, the responses of the same participants to the question "Which of the following AI tools have you used?" before and after the intervention[13] were evaluated. Figure 7 indicates the use of *ChatGPT* increased from 69.1% to 84.3% after the seminar. *Other tools* were used more after the seminar (9.8%) in comparison to before (4.4%). The response for *None* decreased from 27.9% to 9.8%.

Figure 7

Used AI Tools



Note. Others (pre-assessment) included: Canva AI Image Creator, Claude.

Others (post-assessment) included: Perplexity AI, Quill Bot, ChatPDF, AskyourPDF, and an unnamed online tool for grammar correction.

[13] It should be noted that the AI tools in scope were changed during the seminar, hence many AI tools were dropped from this evaluation.

A Mann-Whitney U Test was used to determine if the differences in responses were significant. Table 14 indicates there was a significant difference between the responses for *None* before (n = 68, mean rank = 64.63) and after (n = 51, mean rank = 53.83) the intervention, $Z = -2.43$, $p = .015$. All other differences were insignificant.

Table 14

Used AI Tools

AI Tool	Test	N	Mean Rank	U	Z	Sig.
ChatGPT	Pre-Assessment	68	44.46	1470.50	-1.90	.057
	Post-Assessment	51	23.52	-	-	-
Research Rabbit	Pre-Assessment	68	20.60	1725.50	-0.21	.838
	Post-Assessment	51	16.04	-	-	-
Others	Pre-Assessment	68	58.63	1640.50	-1.16	.247
	Post-Assessment	51	61.83	-	-	-
None	Pre-Assessment	68	64.63	1419.50	-2.43	.015*
	Post-Assessment	51	53.83	-	-	-

Note. * $p < .05$ (2-tailed)

Others included: Canva AI Image Creator, Claude, Perplexity AI, Quill Bot, ChatPDF, AskyourPDF, and an unnamed online tool for grammar correction.

Using frequency distributions, the responses of the participants to the question "How often did you use the following AI tools?" before and after the intervention were evaluated. The results for only ChatGPT are presented due to its popularity in the results above. Figure 8 indicates the responses to *Never*, *Once per month* and *Many times per month* reduced (2.3%, 20.9% and 4.7% respectively) while all other responses increased after the seminar. A Mann-Whitney U Test was used to determine if the differences were significant. Table 15 indicates the difference between the responses before (n = 47, mean rank = 51.96) and after (n = 43, mean rank = 38.44) the seminar was significant, $Z = -2.54$, $p = .011$.

Figure 8

Frequency of Use: ChatGPT

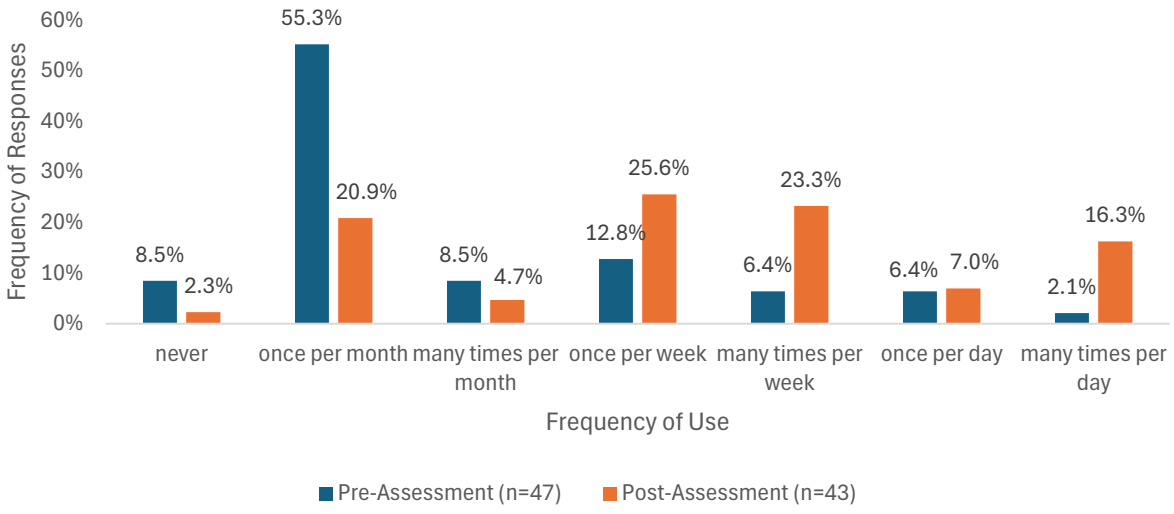


Table 15

Frequency of Use: ChatGPT

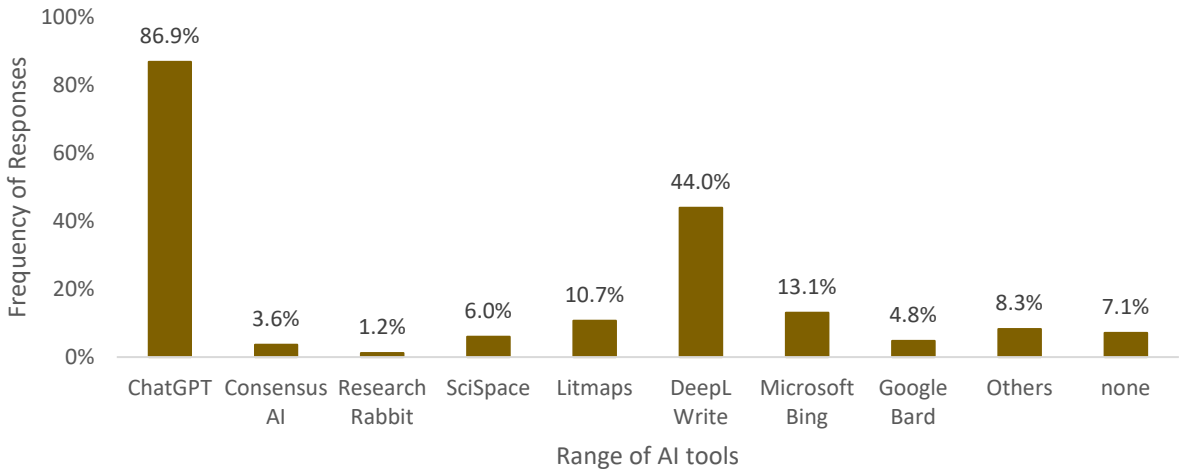
AI Tool	Test	N	Mean Rank	U	Z	Sig.
ChatGPT	Pre-Assessment	47	51.96	707.00	-2.54	.011*
	Post-Assessment	43	38.44	-	-	-

Note. * $p < .05$ (2-tailed)

The combined responses of participants across the 4 levels on which AI tools had been used were evaluated using frequency distributions. Figure 9 indicates *ChatGPT* was most popularly used by participants across the 4 levels (86.9%, n = 84), with DeepL Write being the second most popularly used AI tool (44.0%).

Figure 9

Used AI Tools



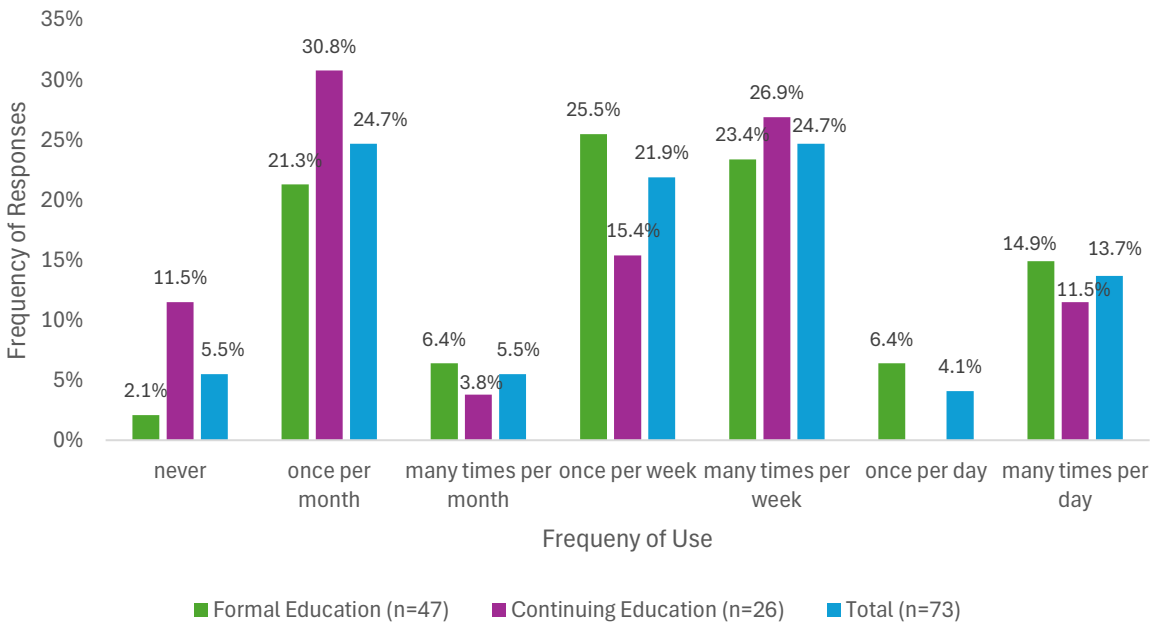
Note. Others included: Perplexity AI, GammaApp, Caption, You.com, Perplexity AI, Quill Bot, ChatPDF, AskyourPDF, and an unnamed online tool for grammar correction.

Frequency distributions were used to assess whether responses to the question "How often did you use the following AI tools?" differed between participants in the formal education programs and the continuing education programs. The results for *ChatGPT* and *DeepL Write* are presented based on their popularity from the results above.

Regarding ChatGPT, Figure 10 indicates that comparatively more participants in the continuing education programs responded to *Never*, *Once per month*, and *Many times per week* (11.5%, 30.8%, and 26.9% respectively). Comparatively more participants in the formal education programs responded to *Many times per month*, *Once per week*, *Once per day*, and *Many times per day* (6.4%, 25.5%, 6.4%, and 14.9% respectively).

Figure 10

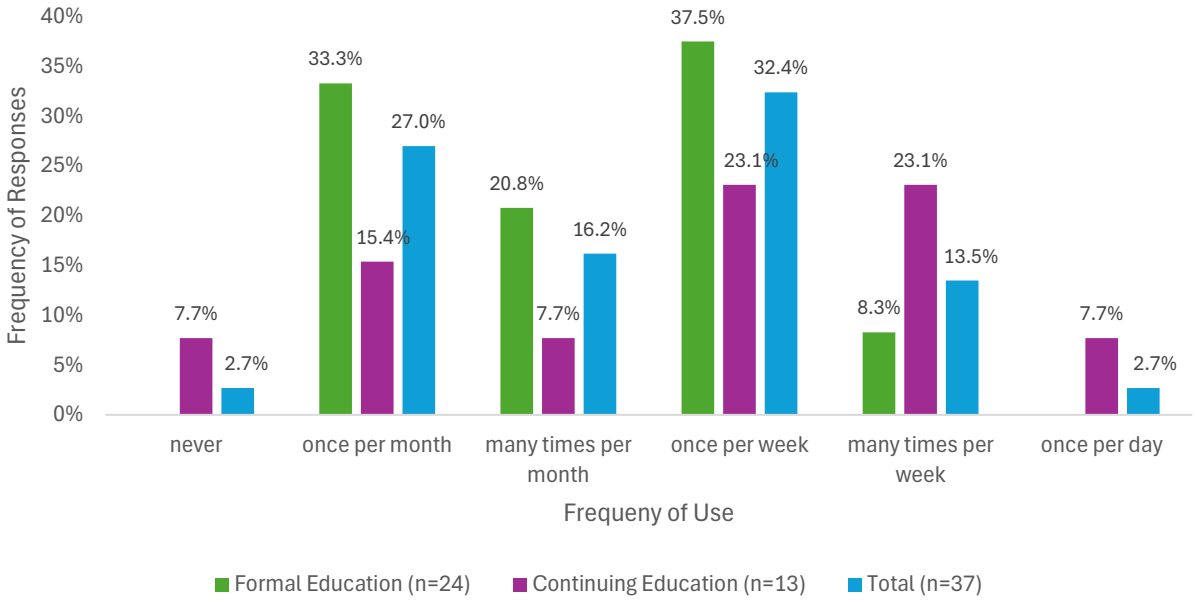
Frequency of Use: ChatGPT



Regarding DeepL Write, Figure 11 indicates that comparatively more participants in the continuing education programs responded to *Never*, *Many times per week*, and *Once per day* (7.7%, 23.1%, and 7.7% respectively). Comparatively more participants in the formal education programs responded to *Once per month*, *Many times per* month, and *Once per week* (33.3%, 20.8%, and 37.5% respectively).

Figure 11

Frequency of Use: DeepL Write



The participants were further asked to rate the usefulness of their selected AI tools. These responses were evaluated using frequency distributions. Figure 12 indicates that more than 50% of the participants in the continuing education programs rated the usefulness of ChatGPT as *neutral*, whereas more than 50% of the participants in the formal education programs rated the usefulness of ChatGPT as *high*. 11.5% of the participants in the continuing education programs rated its usefulness as *low* while 2.1% of those in the formal education programs gave the same rating. No participant in the continuing education program rated its usefulness as *very low* or *very high*. 54.8% of the combined participants found ChatGPT to be useful.

Figure 12

Rating the Usefulness of ChatGPT

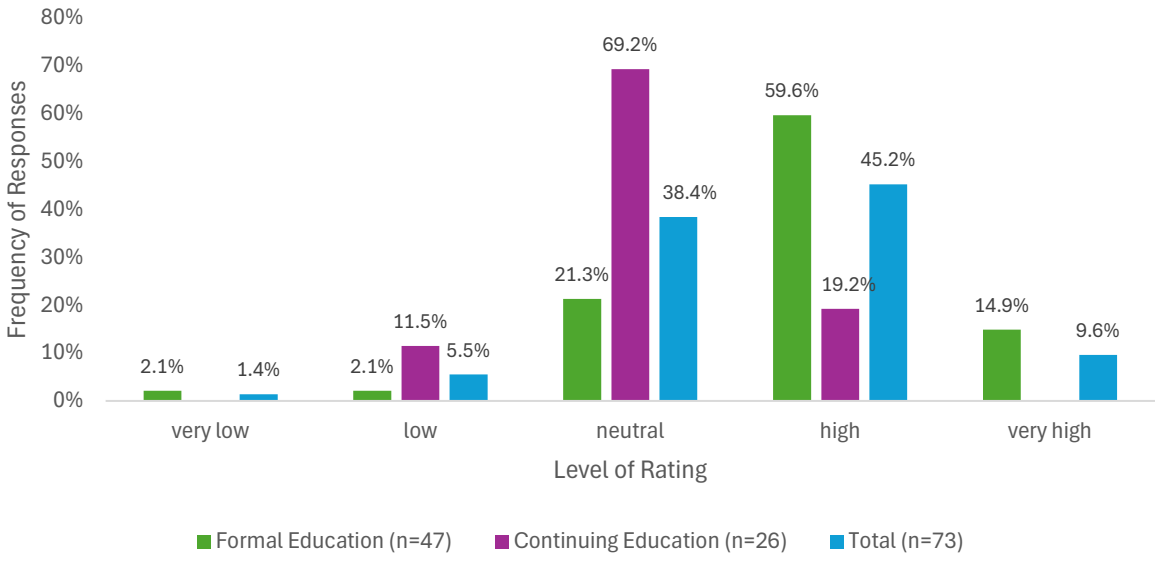


Figure 13 indicates that more than 50% of the participants in the continuing education programs rated the usefulness of DeepL Write as *neutral*, whereas exactly 50% of the participants in the formal education programs rated its usefulness as *high*. More participants in the continuing education programs rated its usefulness as *very high* (15.4%) as compared to those in the formal education programs (8.3%). 48.6% of the combined participants found DeepL Write to be useful. A Mann-Whitney U Test was performed to evaluate whether these differences were significant. Table 16 indicates the difference between the ratings of formal education students (n = 47, mean rank = 44.46) and the continuing education students (n = 26, mean rank = 23.52) for *ChatGPT* alone was significant, $Z = -4.38$, $p < .001$.

Figure 13

Rating the Usefulness of DeepL Write

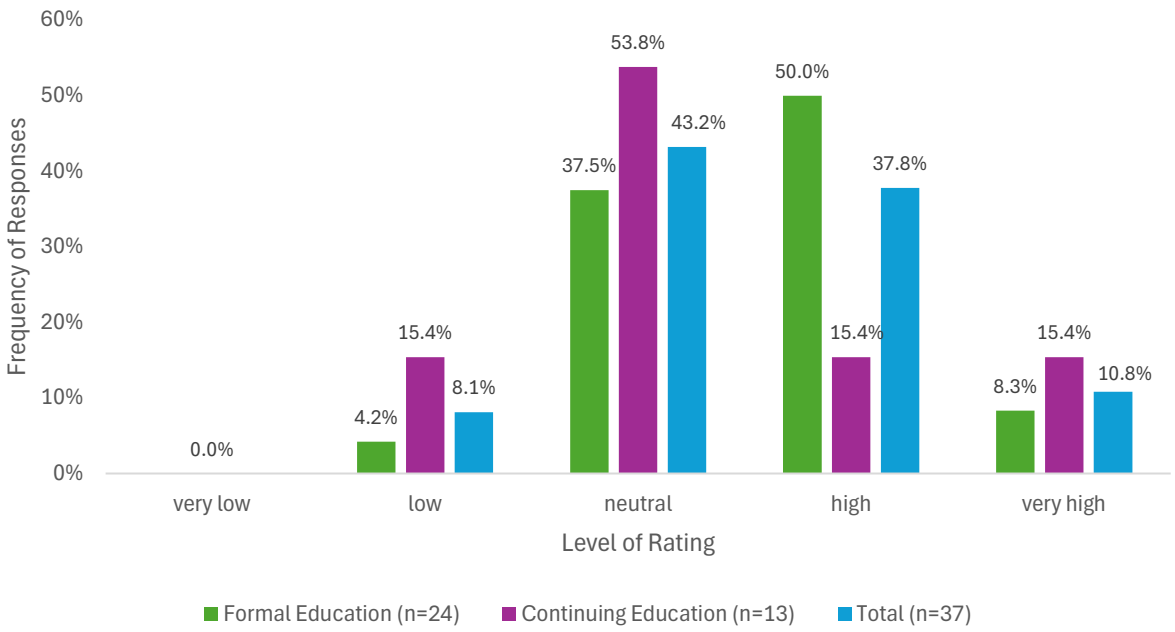


Table 16

Rating the Usefulness of ChatGPT and DeepL Write

AI Tool	Group	N	Mean Rank	U	Z	Sig.
ChatGPT	Formal Education	47	44.46	260.50	-4.38	<.001***
	Continuing Education	26	23.52	-	-	-
DeepL Write	Formal Education	24	20.60	117.50	-1.32	.279
	Continuing Education	13	16.04	-	-	-

Note. *** $p < .001$ (2-tailed)

Qualitative Findings. Participants at the BSc level attributed the reason for increased use of ChatGPT to not just its popularity, but also its user friendliness and benefits. This was confirmed by the participants at the MSc level. One participant was "discouraged from using other tools due to the need to create accounts for each one". Some participants in both formal education programs reported they saw great value with the paid version of ChatGPT, whereas other participants were satisfied with the free version. Being aware of its limitations, participants described their use as cautious.

Some participants from the continuing education programs indicated that their use of ChatGPT was mainly for basic tasks at the office such as responding to emails and summarizing text with an infrequent use for academic activities. A few were disappointed by its performance and felt that the tool was still not fully developed and that its potential was limited by the use-case. Others were impressed by the functionality of DeepL Write and preferred using that for their academic assignments over ChatGPT.

Theme 2: Effort Expectancy

This theme focused on students' perspective regarding how much effort was required when using AI. This included ease of use and time invested before and during use.

At the beginning of the introductory seminar participants from the BSc level shared differing opinions on the effort required to use AI based on either their prior experience or perceived expectations. Some participants expressed the user-friendliness of AI tools was a great benefit, while others reported they achieved goals by simply using keywords. An additional benefit was the accessibility of these tools. Due to the ease of use, participants reported increased efficiency and faster resolution of their daily tasks, as well as application in use-cases such product designing and problem-solving contexts. One participant stated, "Instead of wasting too much time with Google, you can expect a concrete answer to the question from AI." On the contrary, other participants were discouraged by the effort required to know and understand how to use AI tools. They pointed out their lack of technical knowledge and experience and were concerned about the risk of incorrect use.

These conflicting opinions were presented after the interventions across each level. For those of a positive view, the tools were labelled practical and comfortable to use. The effort required to gain access to vast range of knowledge, structure plans, translate languages, and support with other activities was considered minimal and efficient. One participant stated, "AI always has an answer and I found these simply through the use of keywords." The tools were used in conjunction with other programs such as Excel, coding software, and as plugins for web searches, as expressed by a participant "I was often able to solve coding problems through ChatGPT. You are not dependent on an expert's answer or must laboriously search for the solution in forums". In contrast, other participants indicated they had challenges with learning about and

navigating AI tools. They reported feeling overwhelmed by the time and effort required to test and explore the variety of tools. One participant expressed “With the start of my studies, many new topics are coming at me, and I currently don't have the time to learn about AI tools and figure out how to use them effectively” which was reiterated by another participant, “Depending on the situation, one might be overwhelmed by how to use these tools correctly or practically.” Furthermore, the effort as well as time required to filter and verify the outputs was considered discouraging, as stated by a participant “It was double work to proofread the edits from AI when I could have just done the work by myself.” A few expressed disappointment in the effort they invested in using AI, found it not as user-friendly as labelled by others, and believed they would have been more efficient if they had not tried using AI for their assignment. The complexity of AI was attributed as ‘challenges of new technology’ by a few participants.

A concern was raised by some participants that relatively older generation (indicated as 30+years of age) may not be able to keep up with the effort required, as expressed by this participant “One challenge is proper usage and that I can no longer keep up with the young ones due to my lack of IT knowledge.” For other participants, the need to create accounts for many AI tools prior to use felt overwhelming. Effort was required to determine which tools to log into and knowing when to use these tools.

Despite the challenges presented, some participants expressed the importance of learning how to use these tools, as expressed “AI is used everywhere, and I am convinced that we cannot and should not resist it. We need to learn how to handle it and use the tools where they make sense and add value.” Overall, these effort-related factors influenced both the increased and discontinued use of some of these AI tools.

Theme 3: Performance Expectancy

This theme focused on the students' perspective regarding how useful AI was in achieving goals. AI tools were evaluated in terms of how well they functioned and delivered results.

At the beginning of the introductory seminar participants from the BSc level shared differing opinions on the performance of AI tools based on their prior experience, actual and perceived benefits, actual and perceived challenges, and concerns regarding integration for their academic program. These were categorized under two broad subthemes.

Theme 3.1: Reasons for Use. In some cases, the AI tools provided participants support with daily tasks (such as writing of emails, finding recipes, and how-to instructions), language translation, content creation, and finding answers to specific topics. Numerous participants indicated that the outputs were accurate, the support was practical and efficient, and they were impressed by the vast access to knowledge AI tools had. Additionally, there was expressed positivity for the potential of AI in the academic setting. A few participants related this to learning, with one stating, "One can create a lesson plan, develop learning strategies, create definitions, and short summaries for learning, etc.", and another, "Sometimes one is overwhelmed by the complexity of certain topics. AI can help provide clarity and resolve any remaining uncertainties. Furthermore, AI can be a source of inspiration for topics."

Theme 3.2: Challenges and Concerns. Participants indicated limitations with the performance of AI tools such as the questionable integrity of information the tools delivered, incomprehensible and complex nature of some responses, perceived unsuitability for scientific writing, error-prone outputs, and the generation of false citations thus increasing the risk of plagiarism. Some of these factors influenced the non- and discontinued use of some of these AI tools.

After the interventions, the combined responses of participants across each level presented mixed perspectives on the performance of AI tools and were further categorized under subthemes.

Theme 3.3: Impact on Academic Activities and Learning. Many participants reported high performance of AI across a variety of tasks. One of these was text optimization, which included proof reading, grammar correction, summarization of long text passages, improving writing flow and overcoming writer's block, and enhancing the scientific language within text. A second area was support with research-related activities, which included literature research and review, defining research questions, refining the methodological approach, creation of interview guides, preparation of presentations, and support with data analyses and writing of reports. A BSc participant shared that AI offered great support in providing clear directions on and examples of what to do, how to do them, and the next steps to take, as they had no research experience.

A last area was generally associated with learning, which included the simplification, clarification, and visualization of concepts, linking theoretical models with practice, gaining inspiration and support with brainstorming, tracking learning progress, and unbiased assessment of ideas and arguments. As indicated by a participant, "I used it very frequently during the learning phase to have complicated texts explained more simply, to visualize concepts, or to test my knowledge". Some AI tools were labelled as a virtual guide and companion, with one participant stating, "AI is very helpful especially when someone does not live with academics. I can easily ask AI for support". Some reported using the AI tools for other academic modules, including qualitative social research, programming, social media research, and statistics. On the other hand, other participants were not convinced of the performance of AI in these areas, although they acknowledged other benefits, like this participant:

> AI tools are not suitable for every application area (e.g., generating texts in assignments or presentations, literature research, or acquiring knowledge, as they are prone to errors, and I

> do not learn anything). They are mainly suitable as support for efficiency in learning and structuring and creating assignments.

Theme 3.4: Impact on Productivity. The support provided by AI was labelled efficient, mostly accurate, practical, and timesaving. Some participants reported that this reduced workload and feelings of stress, provided clarity and reduced ambiguity on tasks and topics, enhanced creativity and the quality of their own work, supported problem-solving, and optimized informational search. AI tools were considered multifunctional, suitable for a vast range of activities and more efficient than Google. Participants reported that AI resolved tedious and repetitive tasks well enough to enable them focus on essential topics. A participant stated:

> Certain questions can be answered quickly and efficiently this way. The alternative, searching through documents, literature, etc., takes significantly longer. Literature research, in my opinion, can be significantly optimized. Statistical values, etc., can be easily interpreted. All in all: a time gain.

Some participants who initially did not want to use AI reported they were convinced by the performance, as stated by this participant, "I could do without both ChatGPT and Microsoft Bing, but it makes my life easier to use them." For even fewer participants, once the purpose of use was fulfilled, they stopped using AI.

Theme 3.5: Quality of Outputs. Although some participants were excited about the quick access to knowledge and the accuracy of outputs, others were mistrusting of the quality of outputs AI delivered and were thus sceptical of their performance. This included a high error rate, questionable validity of sources, "over-done" text, delivery of outdated information, loss or change of context in the responses, and complex and unclear outputs. A participant indicated, "Partially false answers are presented very plausibly and convincingly. As soon as the topic becomes complex, there are often false answers. This requires basic knowledge and scepticism."

There was expressed surprise that different answers were provided to the same question which indicated inconsistency in performance.

Further concerns for their own work were raised such as the reduced quality of one's work, the obvious tone of AI-generated responses, and the similarity of written assignments submitted by different students on the same topic. Other participants reported their cautious use of AI due to their scepticism of the outputs, as stated by one, "For rephrasing sentences, I did not adopt it 1:1, but it served as an inspiration on how to formulate a sentence better." Some participants reported having to readjust their expectations based on their experience whereas others had no expectations. A few expressed their general disappointment with AI tools whereas others were impressed. Overall, these performance-related factors not only influenced both the increased and discontinued use of some of these AI tools but also caused some participants to be more cautious with their use.

Theme 4: Facilitating Conditions

This topic focused on the participants' self-evaluation of digital competency, desired support and content for training as well as the format in which this should be presented.

After the interventions, participants across the 4 levels responded to the question "How confident are you that you can meaningfully use AI tools for your psychology program at the FHNW?".

Quantitative Findings. With the use of frequency distributions, responses of participants from both the formal education and continuing education programs were compared. Figure 14 indicates an equal proportion of participants from the formal education programs were *somehow sure* and *very sure* (41.8%). Comparatively less participants from the continuing education programs were *sure* (37.9%) and *very sure* (31.0%). 20.7% of participants from the continuing

education programs were *neutral* whereas 5.5% of participants from the formal education programs gave the same response. 78.6% of all participants indicated a positive level of confidence. A Mann-Whitney U test was performed to evaluate whether these differences in the responses were significant. Table 17 indicates the difference between responses of the formal education students (n = 55, mean rank = 44.80) and the continuing education students (n = 29, mean rank = 38.14) after the interventions was insignificant, $Z = -1.27$, $p = .204$.

Figure 14

Self-Confidence in Meaningful Use for School

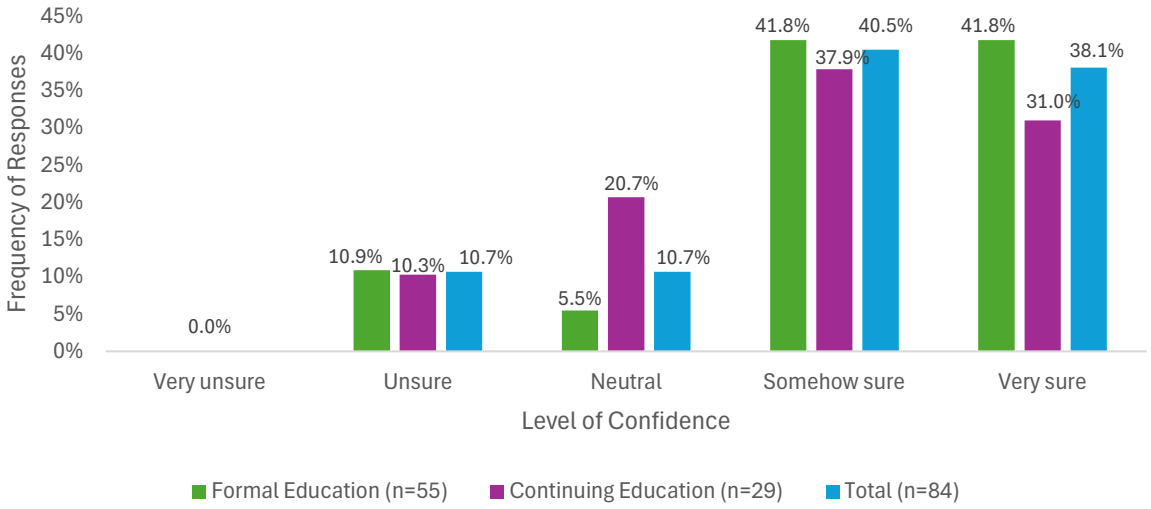


Table 17

Self-Confidence in Meaningful Use for School

	Group	N	Mean Rank	U	Z	Sig.
Confidence in Own Use	Formal Education	55	44.80	671.00	-1.27	.204
	Continuing Education	29	38.14	-	-	-

A frequency distribution was used to evaluate the responses of all participants to the question "To what extent do you agree with the following statement: 'I feel adequately trained to use AI tools in my psychology program/ continuing education at FHNW.'?" Figure 15 indicates 33.3% of all participants disagreed, with 29.8% being neutral and 25% of them agreeing. An equal percentage of participants in the continuing education programs agreed and disagreed (34.5%) with the statement. 32.7% of participants in the formal education programs disagreed with the statement, with 20% in agreement. Less participants in the continuing education programs were neutral (17.2%) in comparison to those in the formal education programs (36.4%). A Mann-Whitney U test was used to evaluate whether these differences were significant. Table 18 indicates there was no significant difference between the responses of the formal education students (n = 55, mean rank = 42.00) and the continuing education students (n = 29, mean rank = 43.45), Z = -2.70, p = .787.

Figure 15

Perceived Adequacy of AI-Training

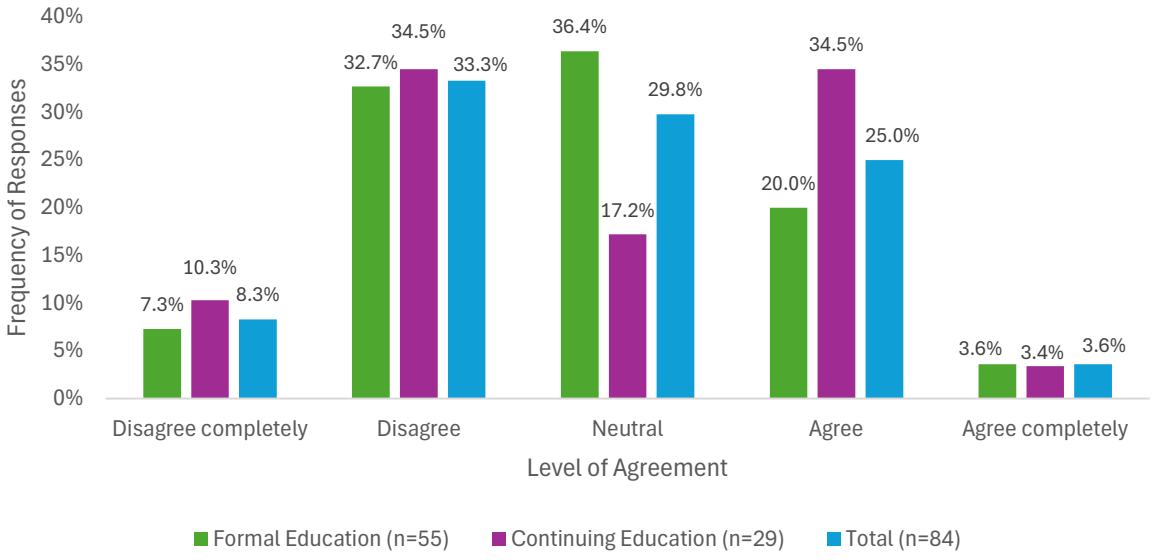


Table 18

Perceived Adequacy of AI-Training

Domain	Group	N	Mean Rank	U	Z	Sig.
Satisfaction with Training/AI-Inputs	Formal Education	55	42.00	770.00	-2.70	.787
	Continuing Education	29	43.45	-	-	-

Qualitative Findings. When asked during the interviews to rate their competence on a scale of 1 (very bad) to 5 (very good), approximately 57% of the participants gave a rating below 3. They attributed their low ratings to a variety of factors including having no time to explore, social comparisons (compared their own competence with that of peers, or that very few significant others in their social environs actively used AI), passive and irregular use of AI, disappointing outcomes, and being familiar with very few or only the popular AI tools. For those who gave a rating of 3 and above, reasons were attributed to their regular use of specific AI tools, satisfaction with the outcomes, and understanding how to collaborate with the tools.

A participant indicated, “Inexperience with AI tools can have a negative influence on user experience.” Some participants indicated that their initial inexperience with AI was a challenge as they were uncertain how to interact with AI. A few reported that the interventions helped address this. Some participants expressed that although they had a general awareness of the pros and cons of AI, they felt they needed to further build their knowledge on the subject matter. In comparison to younger colleagues, relatively older participants (indicated as 30+ years of age) felt not as competent and some of them stated that they felt they were lagging. Statements included, “I am not as technologically savvy like the younger peers” and “I am too used to traditional methods of

learning and do not have the capacity to relearn how to accomplish the same steps with AI". A concern was raised about the creation of a gap due to imbalanced digital competencies.

Many participants indicated the importance of practice to improve their competency and build their own confidence. Furthermore, it was suggested that the university should provide an overview on AI and new introductions to ensure that all students had a similar starting point. One participant suggested the possibility of the university providing licensed AI tools to ensure equal access for all students.

Participants were also asked about their desired content for AI-training. Before the intervention, participants from the BSc level indicated their desire for guidance to meaningfully use AI tools for their academic work. One participant specified, "I would like training on the pros and cons, what the dangers and benefits of AI are. How far can we go with AI, and how do I use AI to enhance my performance?" Another participant however stated that it could be potentially challenging for students to comply with the university's guidelines.

After the interventions, the combined responses of participants across the 4 levels on still-desired training content were further categorized under subthemes.

Theme 4.1: General Overview. As one of the major topics, many participants expressed a need for an overview of a variety of AI tools aside the most popular, the possibilities and limitations, how AI functioned (e.g. the algorithms behind AI), the impact AI-use may have on users, and how AI-use can be connected to psychological concepts. A participant indicated, "I need better understanding of how AI works, where the data used comes from, the different types of AI, and where they can be used effectively." Like many others, another stated "I only know ChatGPT or DeepL Write. Perhaps an introduction to other AI tools and which areas they are suitable for would be great." Referring to the introductory seminar, a BSc participant shared that

without having prior experience with academic writing and research, it was challenging to first understand the processes to follow before integrating AI to support with the assignment. They would have preferred a different structure for the seminar. Another participant expressed:

> The hype around these AI tools is currently very high in our society, and I was glad for an initial warning and for the example that even simple questions are not always answered correctly by them. Therefore, I think the benefit is great, but an introduction and a warning finger are also needed.

In addition to these, there was the expressed desire for periodic updates on the AI-related upgrades and new developments.

Theme 4.2: How to Use. Many participants were concerned about how to use AI for their academic tasks. A few believed this would help create a starting point for all. They expressed a desire for resources that provided further information on contextual use-cases of various AI tools, prompting techniques, how to use the tools more critically and efficiently, how to verify the outputs delivered, and how to cite the use of these tools. A participant specified, "What AI tools are relevant for studies? How can I use Litmaps even better? How can I better use DeepL Write and ChatGPT?" Some participants found it challenging to correctly generate and apply prompts, which increased the fear of wrongful use for some of them. A participant stated, "Depending on how one gives instructions, it's garbage in, garbage out." Other participants pointed out that they needed more practice sessions, as stated by one, "We need to basically learn by doing to find out for ourselves what works and what does not."

Theme 4.3: Format for Training. Responses from participants included the form in which they would like or have liked training on AI. This included interactive workshops including concrete examples/contextual application with subject matter experts, an info-block during the introductory day at the beginning of the academic program, discussions and continuous knowledge building during modules, practical sessions prior to the use of AI for assignments, and

video tutorials. A participant likened this to the university's tutorials on learning management systems such as Moodle, "If we are allowed to use the tools (without consequences), then I would like a brief introduction, like we had for Moodle or the examination program." It was suggested by another "Learning to use AI should be integrated into modules focused on methodical knowledge and approaches."

Some participants at the BSc level indicated that they would have preferred if the introductory seminar was on a consistent weekly basis [14]. While some indicated that having to work in a group enhanced their learning experience, others found the group setting difficult to navigate. There was also an indication that AI-training and sensitization would need to be curated for different groups of students, as the needs of students with more experience with AI may differ from students who may not have a natural affinity for new technology.

***Theme 4.4: Guidelines from FHNW*.** Participants indicated a strong desire for detailed information from both the university and lecturers to facilitate the integration of AI. These included tips from lecturers, specification of accepted AI tools, conditions for and acceptable degree of use, what support is available for AI-use, how to declare use, warnings on the consequences of use, and how to determine balanced use. As summarized by a participant, "Clear rules on when and how to use them, preferably in the form of a guide. Additionally, lists of secure AI tools. Ideally, AI tools developed and managed by FHNW." Concern was generally expressed by many participants that without these guidelines, misuse of the tools would be inevitable.

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[14] In some cases, the break in between each lesson was more than a week.

Theme 5: Social Influence

This theme focused on important reference points for the participants, which included other students, lecturers, work peers, and the university itself, and whether they had an influence on the perspectives of participants regarding AI-use.

At the start of the introductory seminar, one participant indicated their own AI-use was influenced by a YouTube video they watched. A different participant stated, “My concern is forced AI-usage due to external influences such as being constantly discussed”. This concern still presented itself after the seminar, as stated by another participant, “Some students may feel coerced to use AI because other students around them are using it”. Another participant indicated a related concern, “You are at a personal disadvantage whether in terms of time or quality of work if you consciously choose not to use AI”.

After the interventions, the combined responses from the 4 levels highlighted the university as a point of reference for acceptable use. One participant expressed “Clearer guidelines from FHNW are needed on what is allowed and what is not.” Participants were interested to receive further inputs from their lecturers to guide their own use behaviour. These inputs included tips and tricks, specification of use-cases and examples of contextual application during teaching.

A few participants pointed out that the society impacted the popularity of the topic. Even fewer attributed an initial hesitation to use AI to the generation the user belonged to. One participant indicated that their own use of AI was influenced by people within their circle. Many participants expressed feeling empowered by lecturers and the university to use the AI, which influenced their own excitement and openness to use AI for academic activities. Some participants

indicated their interest in not only how the university planned to integrate AI, but also how this would be communicated to both students and lecturers alike.

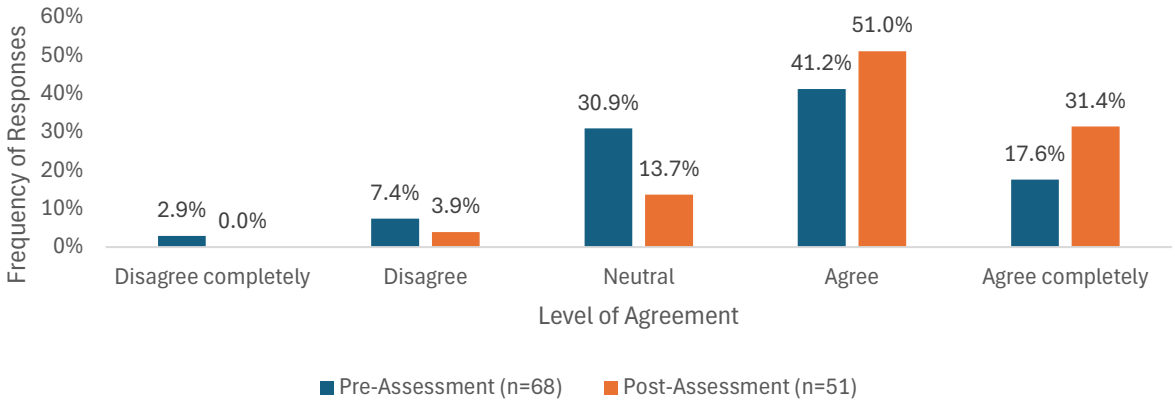
Theme 6: Acceptance of Integration and Change in Attitude

Participants were asked the question "To what extent do you agree with the following statement: 'The inclusion of AI tools in the psychology program/continuing education at FHNW is beneficial.'?" A few participants were later asked to also describe how their attitudes toward AI-integration changed after collaborating with AI tools.

Quantitative Findings. Using frequency distributions, the responses of the participants at the BSc level before and after the intervention were evaluated. Figure 16 indicates the frequencies for the responses *Agree* and *Agree Completely* (51.0% and 31.4% respectively) increased, whereas those for *Disagree completely*, *Disagree*, and *Neutral* (0%, 3.9% and 13.7% respectively) reduced.

Figure 16

Acceptance of AI-Integration



A Mann-Whitney U test was performed to evaluate whether these differences in the responses were significant. Table 19 indicates the difference between the responses of the BSc participants before (n = 68, mean rank = 52.92) and after (n = 51, mean rank = 69.44) the intervention was significant, Z = -2.76, p = .006.

Table 19

Acceptance of AI-Integration

	Test	N	Mean Rank	U	Z	Sig.
Acceptance of AI-Integration	Pre-Assessment	68	52.92	1252.50	-2.76	.006**
	Post-Assessment	51	69.44	-	-	-

Note. *** $p < .01$ (2-tailed)

A comparison between the responses of formal education and continuing education participants was conducted using frequency distributions. Figure 17 indicates the frequencies for the responses slightly differed, with comparatively higher responses to *Disagree* and *Agree* (3.6% and 50.9% respectively) for formal education students and comparatively lower responses for *Neutral* and *Agree Completely* (14.5% and 30.9% respectively) from the same group. Both groups did not respond to *Disagree Completely*. None of the continuing education participants disagreed with AI-integration. 80.9% of all participants either agreed or agreed completely to AI-integration. A Mann-Whitney U test was performed to evaluate whether these differences in the responses were significant. Table 20 indicates no significant difference between the responses of the formal education students (n = 55, mean rank = 42.22) and the continuing education students (n = 29, mean rank = 43.03) after the intervention, $Z = -0.16$, $p = .874$.

Figure 17

Acceptance of AI-Integration

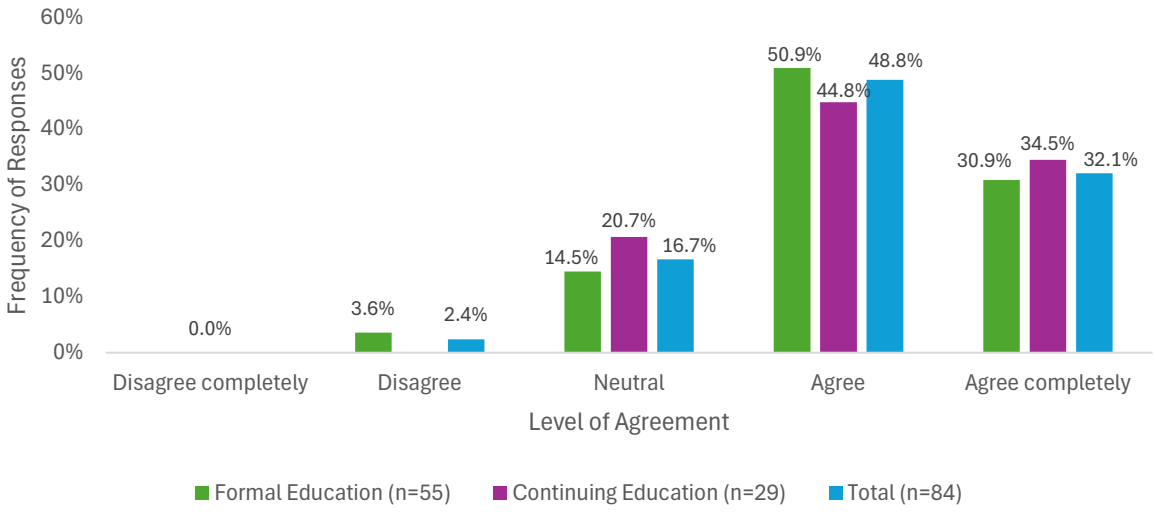


Table 20

Acceptance of AI-Integration

	Group	N	Mean Rank	U	Z	Sig.
Acceptance of AI-Integration	Formal Education	55	42.22	782.00	-0.16	.874
	Continuing Education	29	43.03	-	-	-

Qualitative Findings. Participants from the BSc level attributed the change in responses to the knowledge and experience gained during the seminar. Some indicated their own perspective shift towards a positive view after the seminar. It was reported that the increase in positive responses was due to the efficiency and relief the tools provided during group collaboration on the assignment. A participant who accepted AI-integration also stated, “Students should reflectively use these tools as psychology is not made up of AI tools”. On the other hand, a participant stated, “I don’t find AI useful during my studies” whereas another indicated “I prefer books or the internet itself”. One participant shared why they disagreed with AI-integration:

> AI only connects existing and partly outdated information through increasingly shaped processes and relies solely on digitally represented worlds. This is quite a lot, but, for example, the social and human connections, morality, ethics, shame, etc., are missing, and it ultimately limits to the physical boundaries of information technology.

A participant from another level shared, “There is a risk of the devaluation of education due to over-academization when too many students are graduating because their performance was enhanced by AI.” Many participants from the continuing education programs expressed excitement about the results and one participant pointed out, “By not agreeing completely to the statement, the respondents showed some level of hesitation”. There was some surprise expressed by some of the participants that none of the continuing education participants disagreed with the statement.

Numerous participants across the 4 levels expressed their perspectives on the relevance of AI-integration for the field of psychology. A few participants stated their inexperience with clinical psychology prevented them from determining whether there was value to be added from AI-integration. Others perceived some form of benefit for psychology and mentioned AI could support text- and research-related activities, quickly access clinical psychology databanks, and make the workflow efficient. Some participants highlighted specific contexts in which AI could add value and these included interdisciplinary collaboration, UX design, marketing, social media management, human-machine interaction, and personnel/health management. Others expressed that there was no real value to be added to the field of psychology, with a participant indicating "AI does not know the important literature in psychology and therefore cannot answer many things in depth" and another doubted the applicability of the AI as stated, "AI tools have limited knowledge to relevant psychological literature which affects their outputs".

Some participants from the formal education programs indicated their attitudes towards AI-use changed over the course of the semester. Several participants reported their hesitance at the beginning of the semester to accept AI-use due to concerns about its impact on learning. However, due to the intervention, they currently saw AI as a support tool and used it more often than before. For other participants, there was no reported change in their attitude towards AI as they approached it with cautiousness and continued in this way. One participant upon reflection reported that they could have used AI tools more during the semester. They acknowledged that although they were critical of AI, it had a positive impact on their productivity, and they had become an active-but-conscious user. Another participant reported swinging between a positive and negative outlook regarding AI and conferred with lecturers in situations of uncertainty.

Although some participants found this topic a difficult one, there was a general acknowledgement that it was unavoidable and would have greater influence in the future.

Theme 7: Further Concerns

Participants across the 4 levels expressed the actual or perceived challenges and concerns regarding the integration of AI. For concerns that did not fit any of the other thematic topics above, they were further categorized under subthemes below.

Theme 7.1: Assessment of Performance. Students raised differing concerns about how AI-integration impacted performance-assessments. One of the biggest concerns was how self-effort and AI-assistance would be differentiated, and how this assistance should be declared. One participant stated:

> One challenge will be transparency about what was generated with the help of AI and what is original thought. You become lazy and no longer engage properly with the material (because it is more convenient and time-efficient to use AI). Critical thinking is neglected.

On the other hand, a few participants were concerned that "personal effort would no longer be rewarded" and "certain academic tasks would become too easy". Another participant stated, "A challenge will be that the strengths and achievements of students are not measured by their use of AI (or how well they use AI)."

Another concern was the potential difference between the performance of students who used AI for assignments and those who chose not to. A participant stated, "An unfairness or imbalance could occur depending on a student's access to or knowledge about a specific AI tool." Another concern was, "All students will need to be confident in dealing with AI and the expectations of the university regarding the quality and performance of assignments would increase due to the integration of AI."

There was a suggestion from one participant, “The assessment of performance would need to be changed with less focus on repetitive academic writing and more focus on oral exams, presentations, or other verbal assessments.” They however acknowledged that this would be challenging for lecturers to readjust.

Theme 7.2: Impact on Users. Numerous participants were concerned about the negative impact the use of AI could have on students. This included a negative impact on critical thinking, overdependence on AI, not acquiring knowledge for oneself thereby making learning and skill-development superficial, reduced discussions during group work, and the risk of careless use. AI was labelled as “impersonal, requiring no initiative”. A participant stated, “Using AI could lead to a loss of self-discipline and respect for the subject matter”. The question “What would students do if AI was no longer available?” was asked by a few participants.

One participant mentioned it was easy to get lost in the topic of AI. Another compared AI to horoscopes and explained that students would not be critical of the outputs because they would believe the responses were tailored for them although the information was general. Other participants reported being conflicted as they were aware of both the benefits and risks of using AI tools for their academic work. One participant shared:

> The focus on how to research or how to formulate something could be lost. My concern is that if you become too proficient with these programs, you lose your own way of thinking. You forget how to think for yourself and how to question things. On the other hand, AI can be a good support for your own thought processes. That's why I remain personally sceptical of AI tools but do not want to reject or ban them.

Another participant detailed the impact on the learning process:

> The reading, researching, evaluating, and summarizing of knowledge, the formulating, shaping, and writing down of thoughts are essential steps for me for learning growth and the formation of new insights. If this is taken over by and through algorithms, part of the process is missing. The critical engagement with content becomes less relevant, as the results of artificial intelligence are already seen as insights, but without the process.

> However, I also see it as a tool that can certainly be used as a supplement, at least as part of simpler information procurement.

A few participants suggested that reflective and critical thinking were important skills to develop to ensure appropriate use of AI. Others indicated that they felt better independently completing tasks without AI.

Theme 7.3: Other Concerns. At the start of the introductory seminar, a participant from the BSc level stated:

> I am interested in everything new, but I suspect that the algorithms influence the results. This is generally the case on the internet, but when I "google," I at least see the contexts and can, in my opinion, have more influence. I have no concerns; instead, I look forward to the experiment and find it innovative that it is explicitly tried out as part of the lessons.

After the interventions, participants across the 4 levels expressed a variety of other concerns and perceived challenges including concerns about data privacy as they could not determine how data was being collected or used, whether AI was reading emails based on the generated responses, and feeling challenged by what is unknown.

Theme 8: Perceived Impact of AI-Integration

This topic focused on 10 academic domains (skills, behaviour, or consequences of behaviour) and the type of impact the integration of AI could have on them. Participants across the 4 levels answered the question “In which areas do you expect positive or negative impacts on the psychology program/continuing education program due to the use of AI tools?”.

Quantitative Findings. With the use of frequency distributions, the responses of BSc participants before the intervention were evaluated. Figure 18 indicates the kind of impact the participants perceived for each domain. The combined perception of negative and very negative impact was comparatively higher for *Laziness* (67.7%), *Plagiarism* (69.1%), *Self-efficacy* (50%), and *Critical Thinking* (55.9%). The combined perception of positive and very positive impact was

comparatively higher for *Engagement* (39.7%), *Motivation* (51.5%), *Performance* (48.5%) and *Problem Solving* (66.2%). The perception of a neutral impact was comparatively higher for *Teamwork* (42.6%) and *Exam Anxiety/Nerves* (69.1%)

Figure 18

Perceived Impact of AI-Use on Academic Domains – BSc Pre-assessment

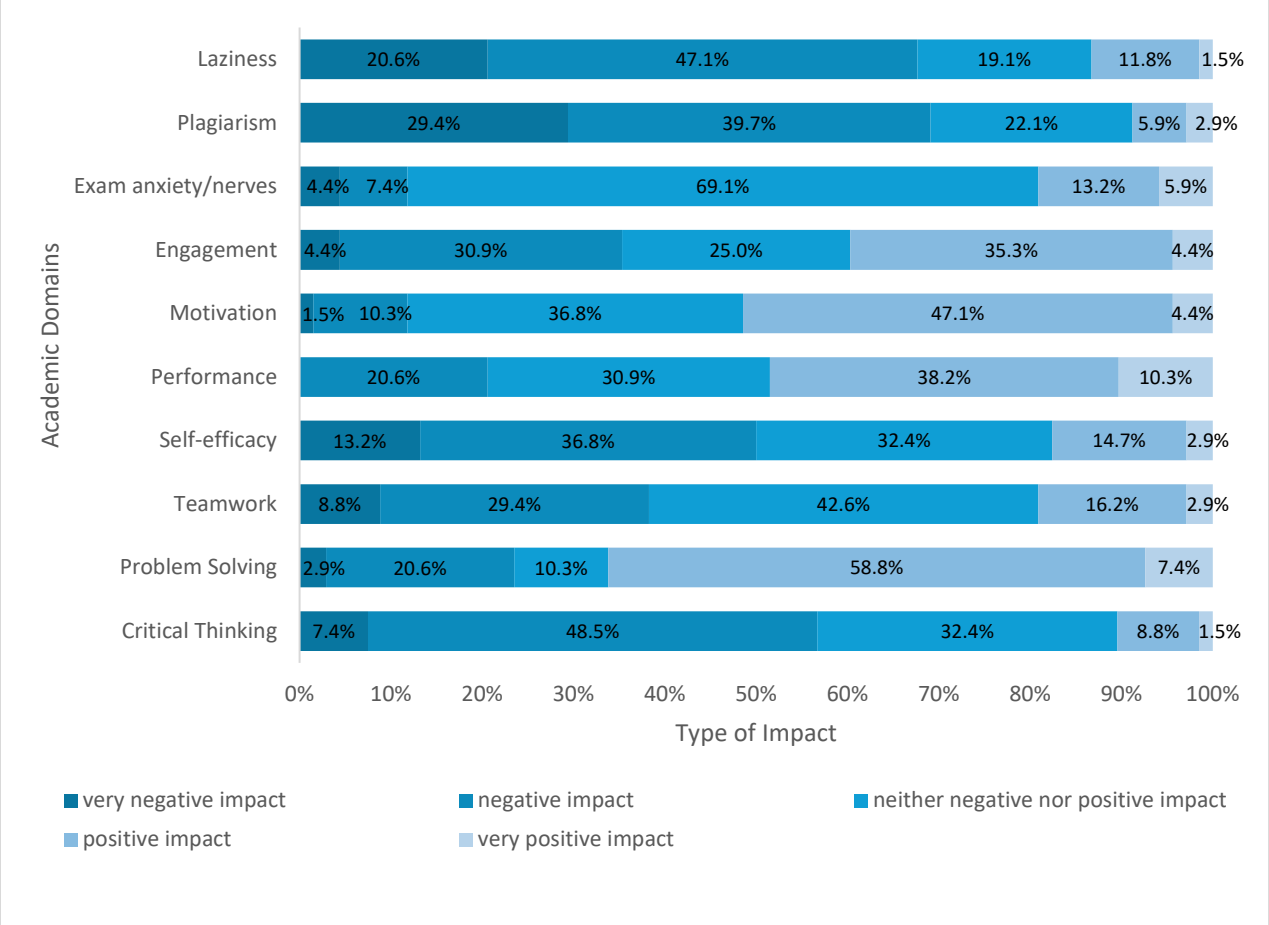
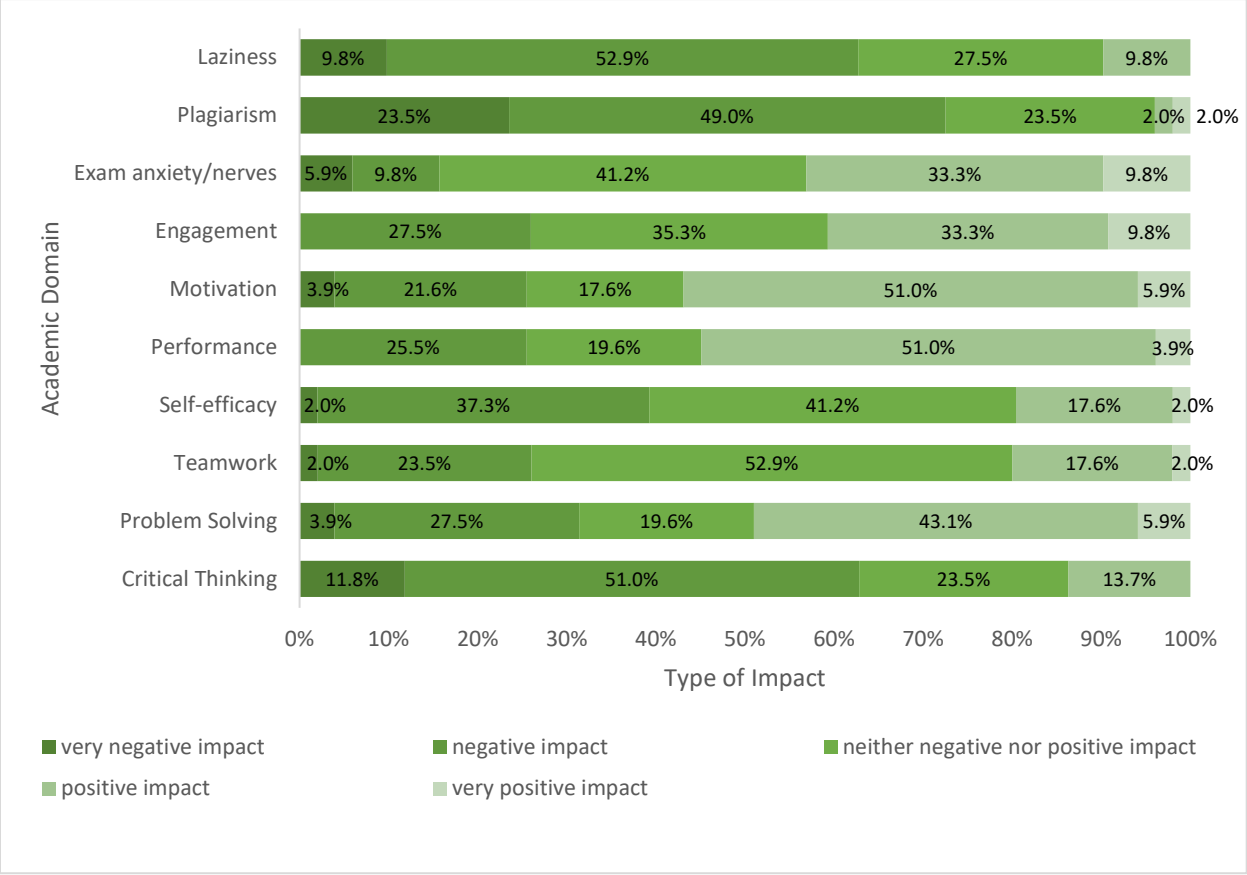


Figure 19 indicates the kind of impact participants at the same level perceived for each domain after the intervention. These were evaluated using frequency distributions. The combined perception of negative and very negative impact was comparatively higher for *Laziness* (62.7%), *Plagiarism* (72.5%), and *Critical Thinking* (62.8%). The combined perception of positive and very positive impact was comparatively higher for *Exam Anxiety/Nerves* (43.1%), *Engagement* (43.1%), *Motivation* (56.9%), *Performance* (54.9%) and *Problem Solving* (49.0%). The perception of a neutral impact was comparatively higher for *Teamwork* (52.9%) and *Self-efficacy* (41.2%).

Figure 19

Perceived Impact of AI-Use on Academic Domains – BSc Post-assessment



Using frequency distributions, these responses before and after the intervention were compared per domain. Figure 20 indicates that the perceived very negative, negative and positive impacts on *Critical Thinking* increased after the seminar (11.8%, 51%, and 13.7% respectively). Responses for neither negative nor positive impact and very positive impact reduced from 32.4% to 23.5% and 1.5% to null respectively after the seminar. Generally, the combined negative responses increased from 55.9% to 62.8% after the seminar.

Figure 20

Perceived Impact of AI-Use on Critical Thinking

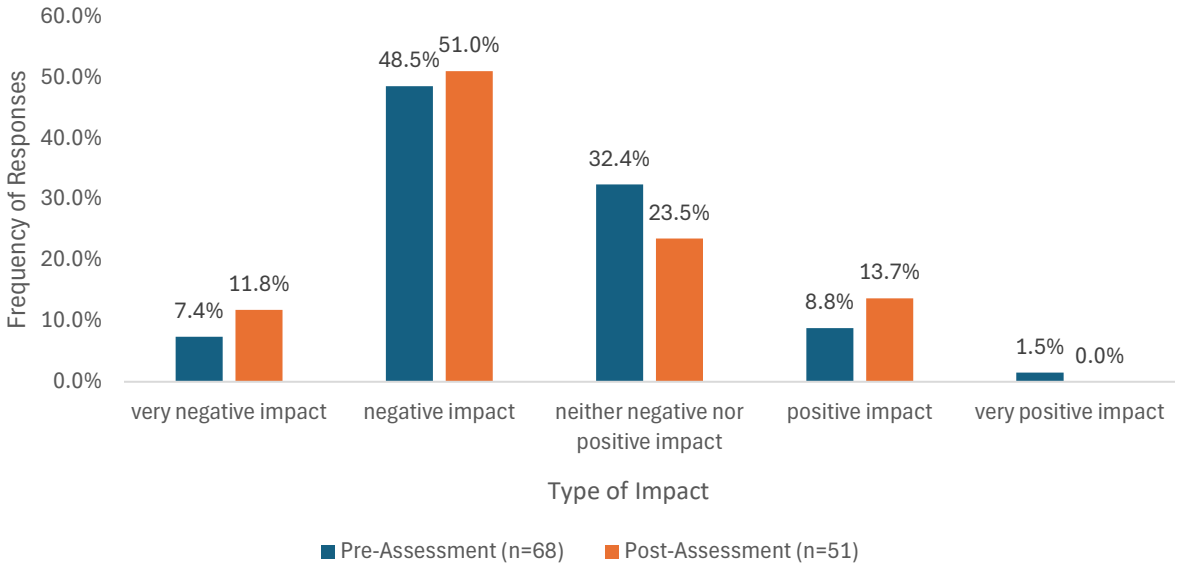


Figure 21 indicates the perceived positive impact on *Problem Solving* reduced from 58.8% to 43.1% after the seminar. There was an increase in responses for both neutrality (19.6%) and perceived negative impact (27.5%) after the seminar. There were slight differences for very negative impact and very positive impact. Generally, the combined positive responses reduced from 66.2% to 49% after the seminar. These responses were nevertheless higher than the combined negative responses, which increased from 23.5% to 31.5% after the seminar.

Figure 21

Perceived Impact of AI-Use on Problem Solving

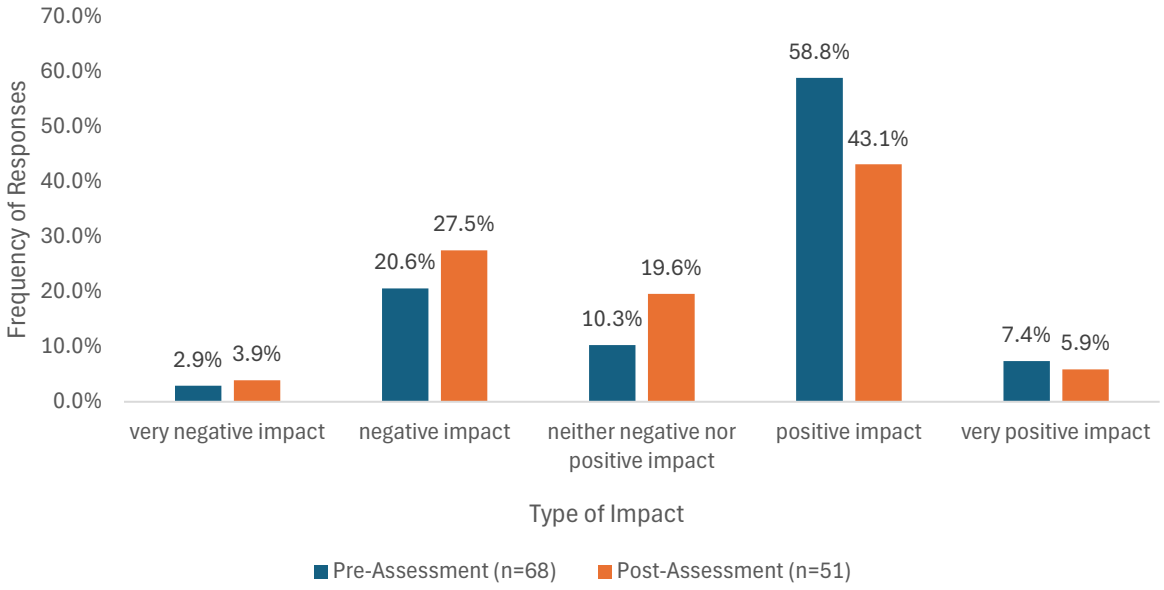


Figure 22 indicates an increase in neither negative nor positive impact on *Teamwork* from 42.6% to 52.9% after the seminar. Responses for very negative impact decreased from 8.8% to 2% and there were slight differences in the responses for negative impact, positive impact, and very positive impact after the seminar. Generally, the combined negative responses reduced from 38.2% to 25.5% after the seminar. These responses remained lower than neutral responses.

Figure 22

Perceived Impact of AI-Use on Teamwork

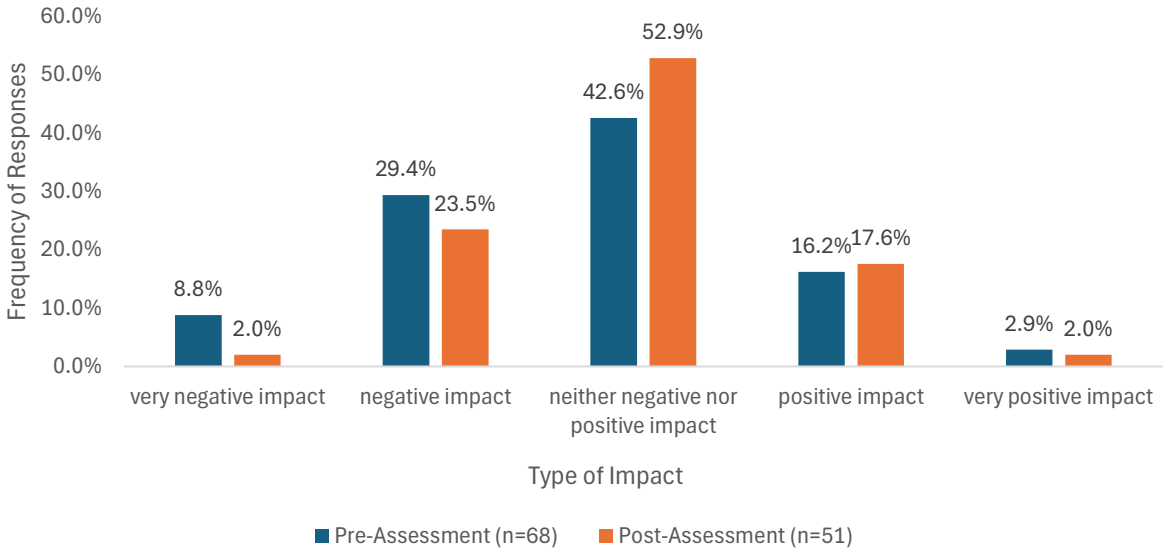


Figure 23 indicates the perceived very negative impact on *Self-efficacy* reduced after the seminar (2%), whereas the perceived positive impact and neutrality increased (17.6% and 41.2% respectively). There were slight differences for negative impact and very positive impact. Generally, the combined negative responses reduced from 50% to 39.3% after the seminar. This reduction was surpassed by the increased neutral responses (41.2%) after the seminar.

Figure 23

Perceived Impact of AI-Use on Self-Efficacy

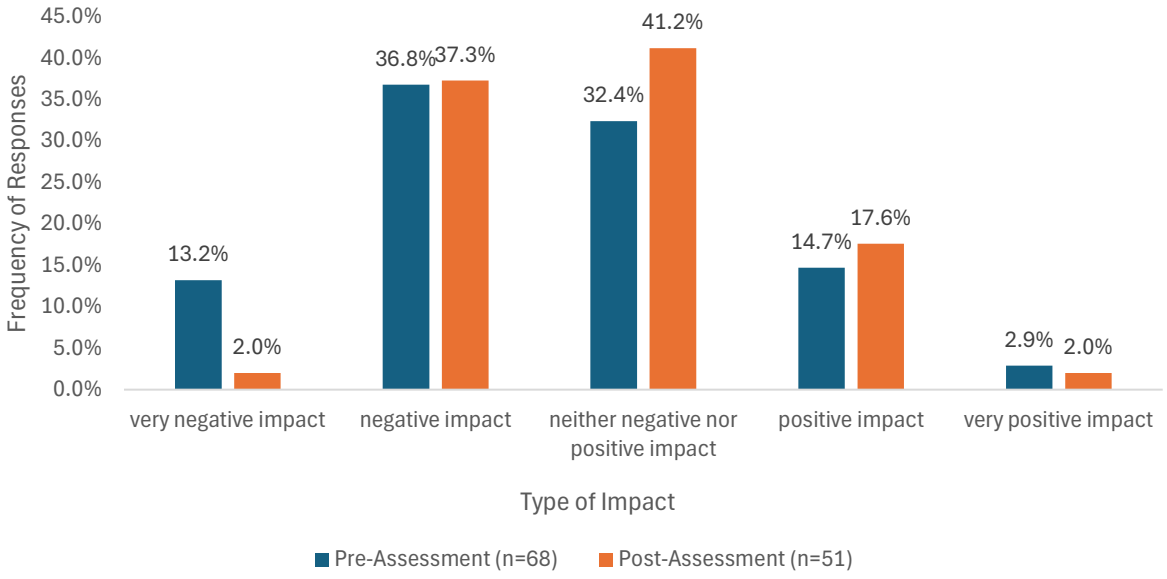


Figure 24 indicates the perceived positive impact and negative impact on *Performance* increased after the seminar (51% and 25.5% respectively). There was a decrease in responses for neutrality (19.6%) and very positive impact (3.9%). Generally, the combined positive responses increased from 48.5% to 54.9% after the seminar. These responses were still higher than the combined negative responses, which increased from 20.6% to 25.5% after the seminar.

Figure 24

Perceived Impact of AI-Use on Performance

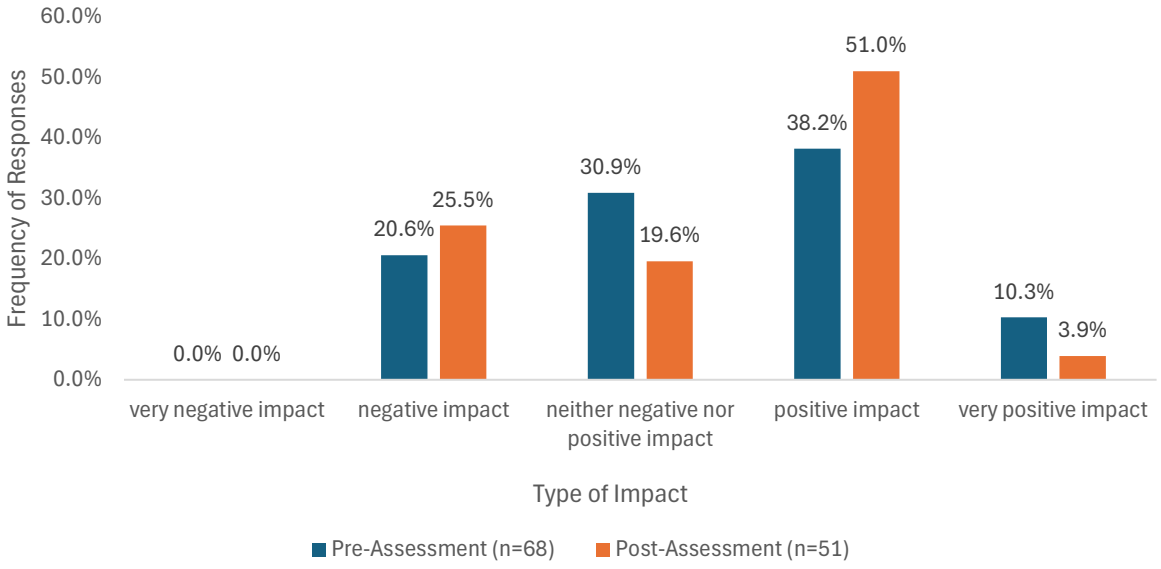


Figure 25 indicates for *Motivation* a reduction in responses for neutrality after the seminar from 36.8% to 17.6%. The responses for very negative impact, negative impact, positive impact and very positive impact increased after the seminar (3.9%, 21.6%, 51%, and 5.9% respectively). Generally, the combined positive responses increased from 51.5% to 56.9% after the seminar. These responses were still higher than the combined negative responses, which increased from 11.8% to 25.5% after the seminar.

Figure 25

Perceived Impact of AI-Use on Motivation

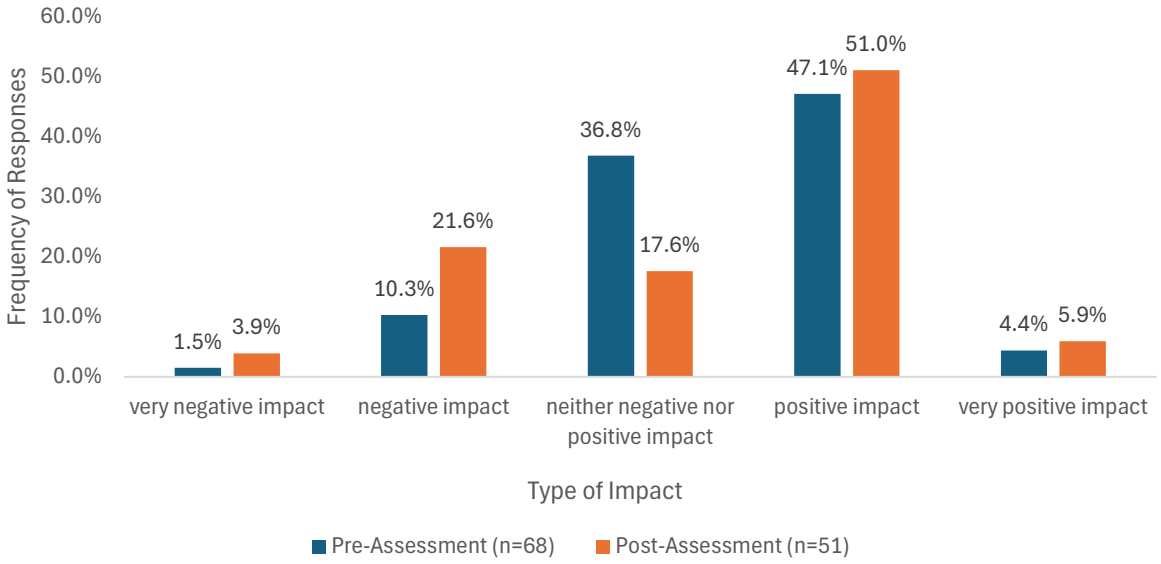


Figure 26 indicates an increase in the responses very positive impact and neither negative nor positive impact on *Engagement* after the seminar (9.8% and 35.3% respectively). Responses for very negative impact, negative impact, and positive impact reduced (0, 27.5% and 33.3% respectively). Generally, the combined positive responses increased from 39.7% to 43.1% after the seminar. These responses were still higher than the neutral responses, which increased from 25% to 35.3% after the seminar.

Figure 26

Perceived Impact of AI-Use on Engagement

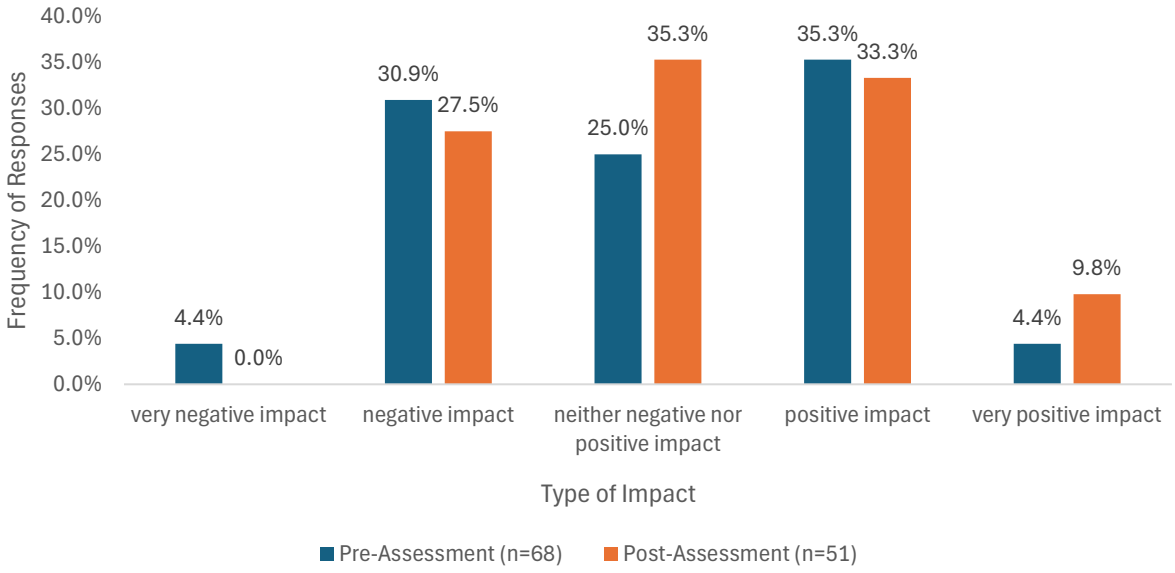


Figure 27 indicates the responses for neither negative nor positive impact on *Exam Anxiety/Nerves* reduced from 69.1% to 41.2% after the seminar. Generally, the combined positive responses increased from 19.1% to 43.1% after the seminar. The combined negative responses slightly increased from 11.8% to 15.7% after the seminar. The responses mostly shifted from neutrality to positivity after the seminar.

Figure 27

Perceived Impact of AI-Use on Exam Anxiety/Nerves

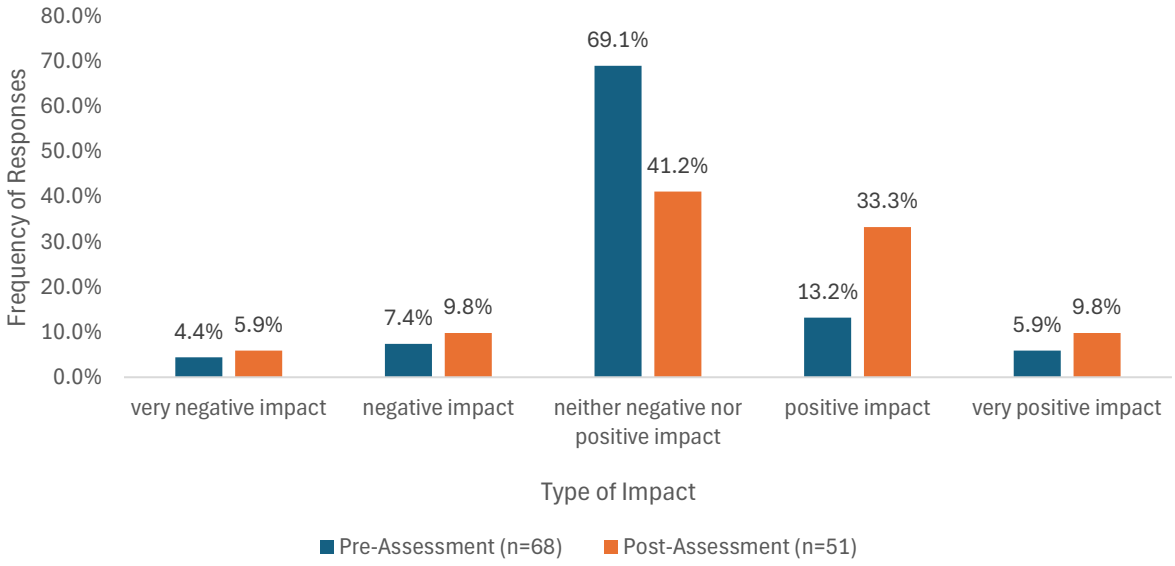


Figure 28 indicates the responses for negative impact on *Plagiarism* reduced after the seminar (49%). There was a decrease in responses for positive impact from 5.9% to 2% and for very negative impact from 29.4% to 23.5% after the seminar. Generally, the combined negative responses increased from 69.1% to 72.5% after the seminar while the combined positive responses reduced from 8.8% to 4%.

Figure 28

Perceived Impact of AI-Use on Plagiarism

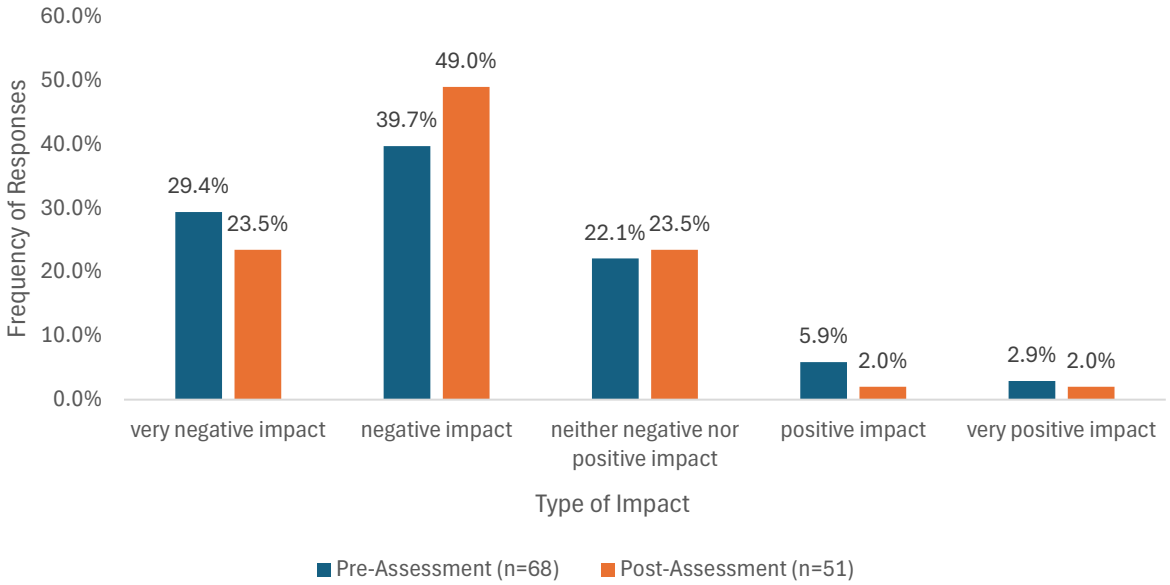
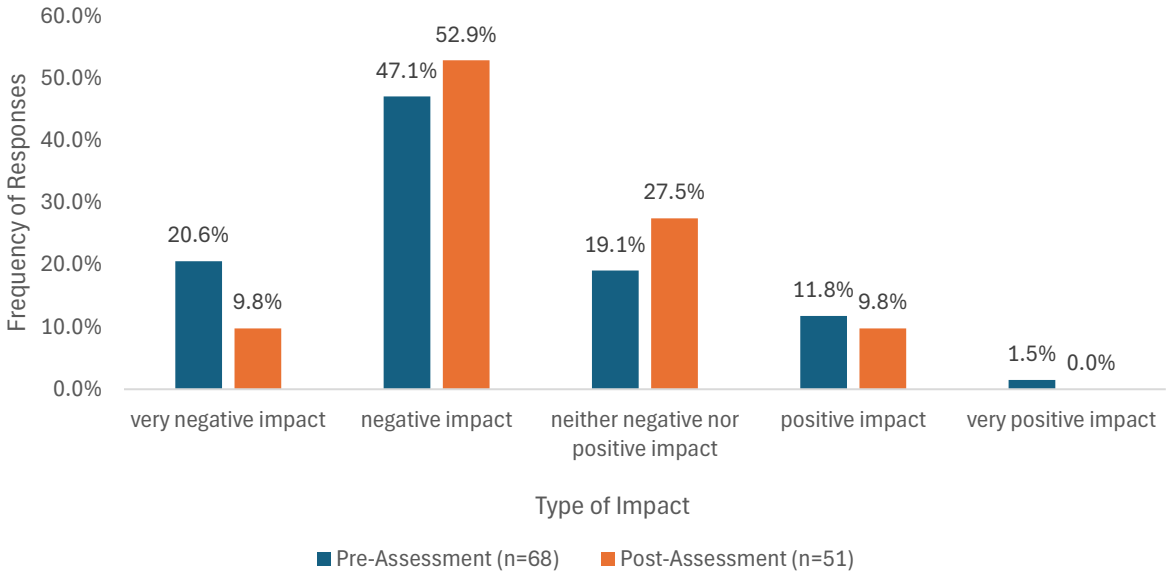


Figure 29 indicates the responses for negative impact and neither negative nor positive impact on *Laziness* increased after the seminar (52.9% and 27.5%). There was a decrease in the responses for very negative impact from 20.6% to 9.8%. Generally, the combined negative responses reduced from 67.7% to 62.7% after the seminar. These responses were still higher than the other responses. The combined positive responses reduced from 13.3% to 9.8% after the seminar.

Figure 29

Perceived Impact of AI-Use on Laziness



A Mann-Whitney U test was used to evaluate whether the differences between the responses of BSc participants before and after the intervention were significant. Table 21 indicates no significance for any of the domains.

Table 21

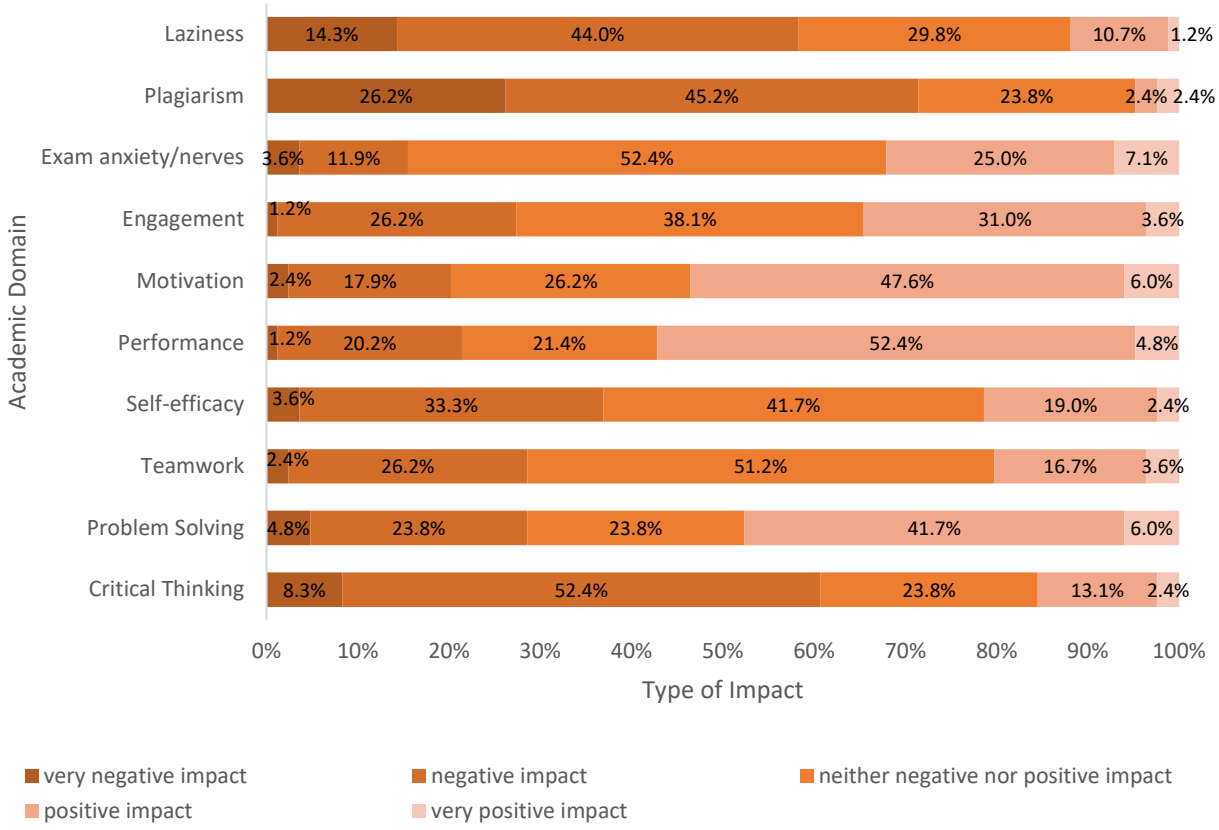
Perceived Impact of AI-Use

Domain	Test	N	Mean Rank	U	Z	Sig.
Critical Thinking	Pre-Assessment	68	61.18	1654.00	-0.47	.642
	Post-Assessment	51	58.43	-	-	-
Problem-solving	Pre-Assessment	68	63.95	1465.50	-1.57	.116
	Post-Assessment	51	54.74	-	-	-
Teamwork	Pre-Assessment	68	56.57	1501.00	-1.34	.180
	Post-Assessment	51	64.57	-	-	-
Self-efficacy	Pre-Assessment	68	56.47	1494.00	-1.36	.174
	Post-Assessment	51	64.71	-	-	-
Performance	Pre-Assessment	68	60.31	1713.00	-0.12	.905
	Post-Assessment	51	59.59	-	-	-
Motivation	Pre-Assessment	68	60.38	1708.50	-0.15	.882
	Post-Assessment	51	59.50	-	-	-
Engagement	Pre-Assessment	68	58.91	1660.00	-0.42	.677
	Post-Assessment	51	61.45	-	-	-
Exam nerves/anxiety	Pre-Assessment	68	55.57	1433.00	-1.81	.071
	Post-Assessment	51	65.90	-	-	-
Plagiarism	Pre-Assessment	68	59.88	1725.50	-0.05	.961
	Post-Assessment	51	60.17	-	-	-
Laziness	Pre-Assessment	68	57.63	1573.00	-0.93	.352
	Post-Assessment	51	63.16	-	-	-

Using frequency distributions, the combined responses of participants across the 4 levels were evaluated. Figure 30 indicates there were more negative responses for the domains *Laziness* (58.3%), *Plagiarism* (71.4%), and *Critical Thinking* (60.7%). Comparatively, there were more positive responses for the domains *Motivation* (53.6%), *Performance* (57.2%), and *Problem Solving* (47.7%). Neutrality was mostly indicated for *Exam anxiety/nerves* (52.4%), *Engagement* (38.1%), *Self-efficacy* (41.7%), and *Teamwork* (51.2%).

Figure 30

Perceived Impact of AI-Use



Qualitative Findings. During the interviews, participants were shown the quantitative results of the respective academic levels and asked to provide their own perspectives on what could have influenced the quantitative responses.

Most of the participants from the formal education programs attributed the negative impact on the domain *Laziness* to the possible transfer of responsibility to AI. It was further indicated that the use of AI could reduce the desire to perform certain tasks. It was explained that by being over-efficient, tasks would become easier, and less time would be required, which meant students may put in less effort and become lazy. Contrary to this, another participant of a positive viewpoint indicated based on their own experience, collaborating with AI enabled quicker progress, which increased their own motivation to keep working on their tasks and reduced the tendency to be lazy. Another participant suggested that the impact, whether negative or positive, was dependent on the individual.

For the domain *Plagiarism*, participants from the formal education programs explained that many students were aware of one critical limitation of AI, which was the absence of citations and sources. The negative impact was attributed to the copy-paste attitude of some students which increased their risk of plagiarising. Furthermore, some students expressed their own fear of unknowingly plagiarising content due to the use of AI. One participant stated that there existed low trust and high insecurity regarding this topic. Participants from the continuing education programs suggested that the problem was not with AI tools themselves, but how students cited information provided by AI, regardless of where the text was copied from.

Participants from the formal education programs held differing viewpoints on the domain *Exam anxiety/nerves*. Whereas some were neutral and could not see any impact, others indicated that students would transfer the responsibility of learning to AI, making them feel less prepared

and increasing exam nerves. Hence the negative impact. However other participants, based on their own experience, indicated that AI offered great support during their preparations for examinations, hence the positive impact. One participant expressed that the possibility of using AI during examinations could offer a greater positive impact than use for preparations.

For the domain *Engagement*, participants from the formal education programs held varied opinions about the outcomes. The results were considered representative of the experiences of some groups as team members had differing viewpoints on AI and how it could be used. One point of view indicated there was positive impact in promoting participation as students could find and share solutions instead of staying quiet or leaving the work for others to do. Those who held a negative viewpoint attributed this to the reduced effort of students due to their dependence on AI. Other participants indicated their neutrality on the topic was due to reduced scepticism but were not yet fully convinced of the positive impact.

Most participants from the formal education programs agreed with the positive impact on the domain *Motivation*. This was attributed to the good responses, support with stressful tasks, and efficiency AI provided thereby enabling students to complete assignments especially during time constraints. AI was considered a tool like SPSS and MAXQDA. A few others indicated a negative impact on their motivation as they felt AI outperformed them in certain skills such as writing. It was further suggested that the outcomes were generally dependent on individual experience. Participants from the continuing education programs saw no direct impact on *Motivation* and were generally neutral. It was considered that the negative impact could be more pronounced when expectations of AI were unmet.

Some participants from the formal education programs saw AI as a supportive tool to enhance *Performance*. A few of them indicated that they were not as sceptical as before due to the

intervention. One of them believed their final grade for their assignment was only so good because they had the support of AI. On the other hand, a few participants attributed their neutrality to the awareness of that although AI offered great support, once taken away, they would have to deal with tasks completely by themselves. Participants from the continuing education programs indicated a need to define performance when discussing this topic. In terms of end results, this was determined to be dependent on the individual themselves and participants acknowledged potential risks to this. However, when defining performance in terms of working on a task, it was considered that AI could positively impact one's efficiency and thus improve performance.

Regarding *Self-efficacy,* some participants from the BSc level attributed the negative responses to the transfer of responsibility to AI, which in turn would increase laziness. Others saw a neutral impact as they believed the impact was dependent on how each student perceived and used AI.

Participants from the formal education programs had differing perspectives on the results for the domain *Teamwork*. For those who saw a negative impact, this was attributed to the risk of reduced collaboration with group members due to reliance on AI. Moreover, a concern was raised on how individual use may impact the team in situations where use was not declared, or the quality of work was impacted, thereby resulting in a lower group score. Nevertheless, those of a more neutral viewpoint believed there was ultimately no direct impact on teamwork itself as team members used AI for their own separate tasks. On a further note, those with a positive viewpoint attributed this to the increased efficiency of each member's work leading to increased contributions during discussions, the finding of structure, relief of workload, and the saving of time, rehashing an indirect impact on teamwork.

For the domain *Problem Solving*, participants from the formal education programs had both positive and negative perspectives. From those holding a negative viewpoint, it was argued that responsibility was transferred from the students to AI, thereby limiting one's ability to train their brain to solve problems and increasing laziness. Additionally, a few were disappointed in their experience collaborating with AI. Those holding a positive viewpoint argued that AI could provide alternative solutions which could expand the perspectives of students. AI was labelled as a path to a goal and not a means to an end, but this was said to be dependent on the morals and attitudes of the student. For those who were neutral, this was attributed as a slight shift from scepticism. Participants from the continuing education programs also expressed the opportunity to develop initial ideas and gain multiple perspectives as a positive factor. Others contested that with the current state of tools, they could not offer as much support.

For the domain *Critical Thinking*, participants from the formal education programs mostly agreed with the negative impact. The assumptions included the negative press of AI, using a copy-paste approach, and the risk of reduced questioning of information AI delivered. The concern raised was that many students will take AI-responses at face value. On the other hand, the positive impact was attributed to the quicker insights AI provided on a topic which could make critical thinking relatively easier due to having a better overview and structure of information. One participant expressed their neutral viewpoint as they believed that critical thinking was solely dependent on the user and AI bore no influence on this.

Overall, the combined findings from the 3 hypotheses and further findings provided comprehensive insights on the multifaceted factors that not only impacted AI-integration, but how this integration was perceived to impact the students themselves. While the quantitative data showed some trends, the qualitative data offered deeper insights into not just these trends, but the

experiences and perceptions of students and how these have been influenced by the respective interventions, answering the research question.

Sub-Research Question

The sub-focus of this thesis was to answer the question "What are the perspectives of lecturers regarding the integration of AI tools?". The quantitative and qualitative data points are presented based on themes from the survey. All quantitative results were evaluated using frequency distributions.

Theme 1: General Use of AI

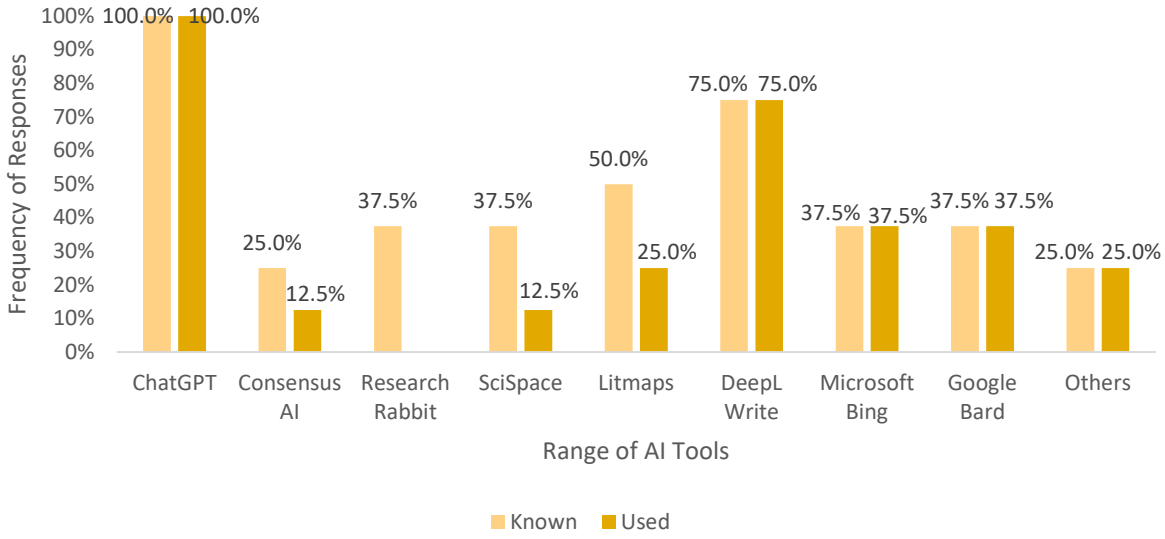
This theme focused on the lecturers' use of the selected range of AI tools. This included known and used tools, frequency of use, and reasons for use/discontinued use.

Quantitative findings

Figure 31 indicates all AI tools in the selected range were known by the participants (n = 8), with *ChatGPT* being the most popularly known as well as used tool. *Research Rabbit* was the only tool not used by any of the participants.

Figure 31

Known and Used AI Tools

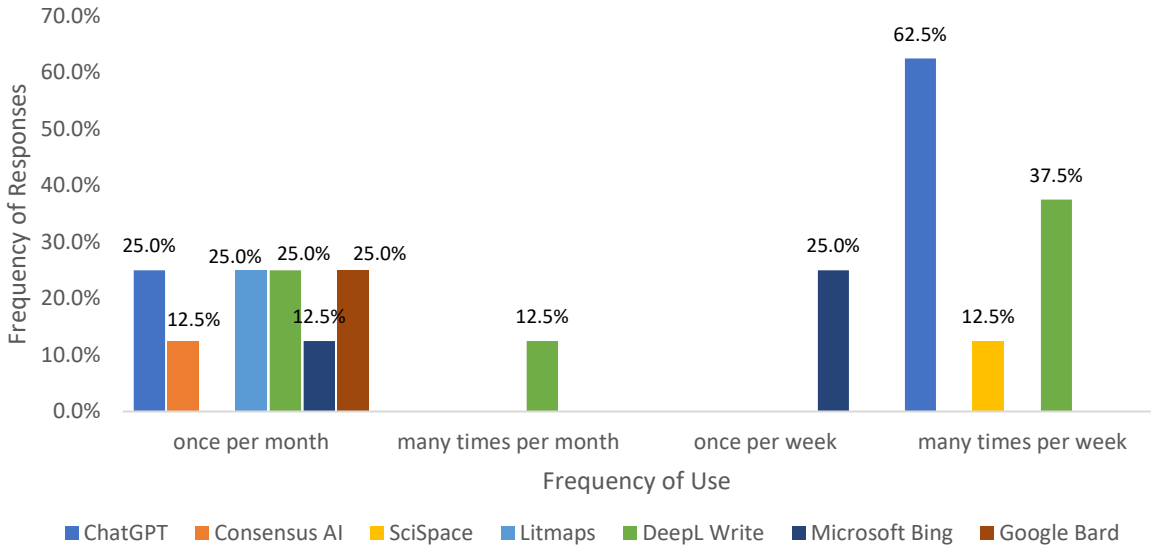


Note. Others included Perplexity AI.

Figure 32 indicates *ChatGPT, SciSpace*, and *DeepL Write* were used many times per week (62.5%, 12.5% and 37.5% respectively) by some participants. Aside *SciSpace*, all other tools were used once a month by some participants. There were no responses for *never*, *once per day*, and *many times per day*, thus not presented in the figure.

Figure 32

Frequency of Use: Various AI Tools



Qualitative findings

All participants had used at least one of the AI tools. When asked what the tool(s) were used for, responses included text-related support (such as creation/optimization of text, grammar correction, paraphrasing, etc), literature research, brainstorming and information search, support with providing feedback, language translation, creation of pictures, and "whatever possible". A few lecturers mentioned they only tested some of the AI tools. 3 participants indicated that they discontinued use of Google Bard, Microsoft Bing and/or ChatGPT. Reasons included, "Google Bard and MS Bing are still somewhat rough and unreliable" and "ChatGPT is included in Microsoft Co-Pilot/Bing."

Theme 2: Perspectives regarding students' use of AI

This theme focused on the lecturers' perceived benefits and concerns of AI integration for students.

Quantitative findings

Participants were asked the question "How reasonable do you consider it for students to use AI for academic tasks?". Figure 33 indicates that most of them considered it *very reasonable* (62.5%). There were no responses for *not reasonable at all*, *not reasonable*, and *neutral*.

Figure 33

Students Using AI Tools for Academic Tasks

Participants were asked how important AI-knowledge was for the professional careers of students. Figure 34 indicates most of the participants responded *very relevant* (75%). There were no responses for *completely irrelevant*, *irrelevant*, and *neutral*.

Figure 34

Knowledge Relevance for Students' Careers

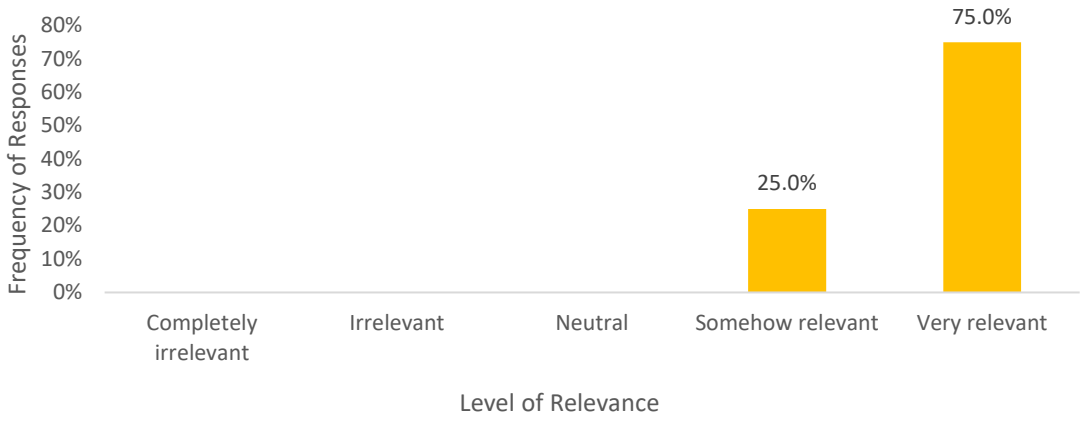
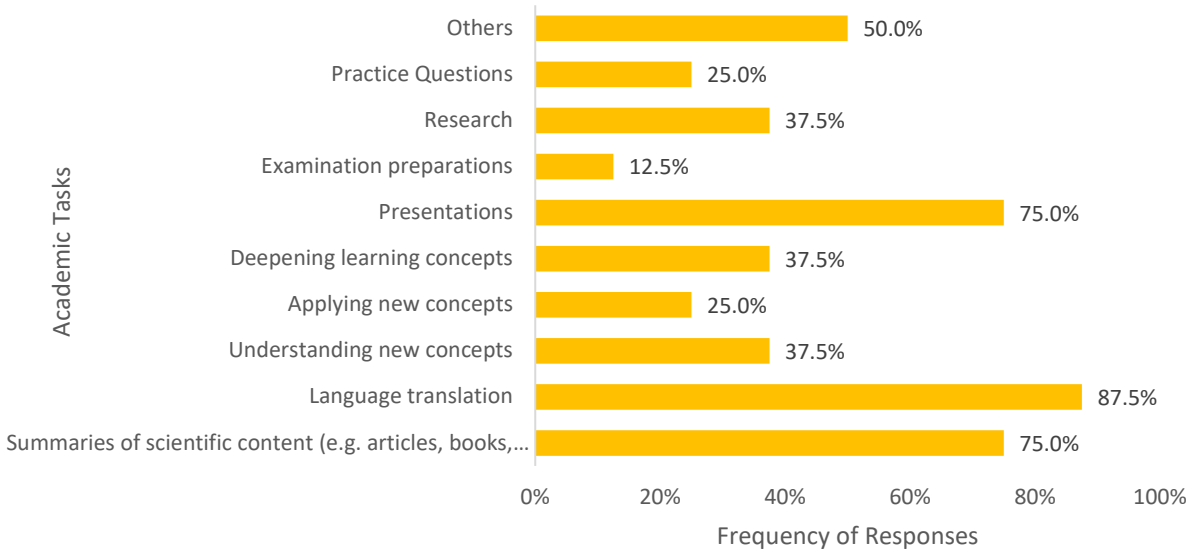


Figure 35 indicates the responses of participants to the question "In which academic-related tasks do you see the possibility of support from AI tools?" More than 50% of the participants saw possibilities for AI-support for *Summaries of scientific content* (75.0%), *Language translation* (87.5%), and *Presentations* (75.0%). 50% of participants indicated other activities with which AI could support students.

Figure 35

Possible AI-Support for Academic Activities

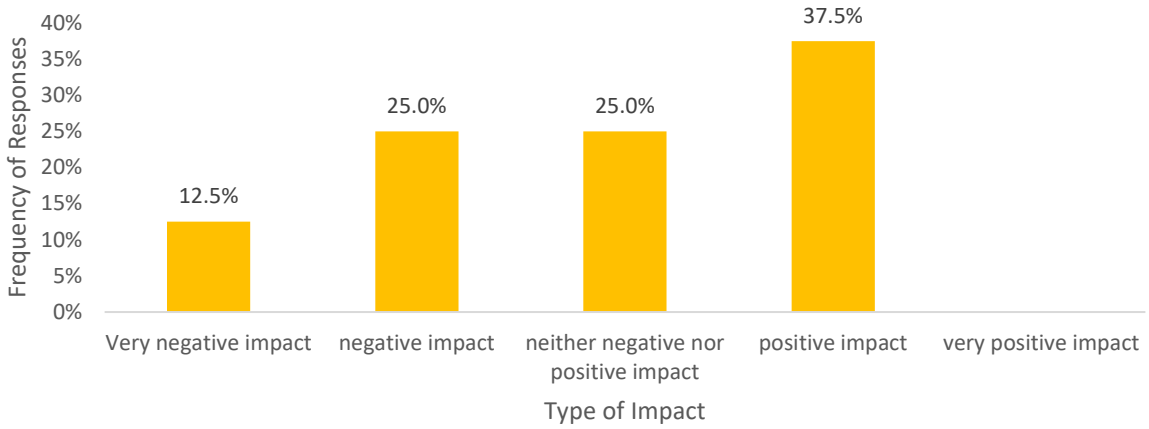


Note. Others include Picture creation, Writing/optimization of text, Literature research, Writing of R/Python-codes and help with troubleshooting, Learning to use reflectively, Awareness training.

Figure 36 indicates the responses to the question “How would you rate the impact of AI on students’ learning outcomes?” 37.5% of the participants rated this as positive while 25.0% of them rated this as negative and 12.5% as very negative. 25% of the responses were neutral. None indicated a very positive impact.

Figure 36

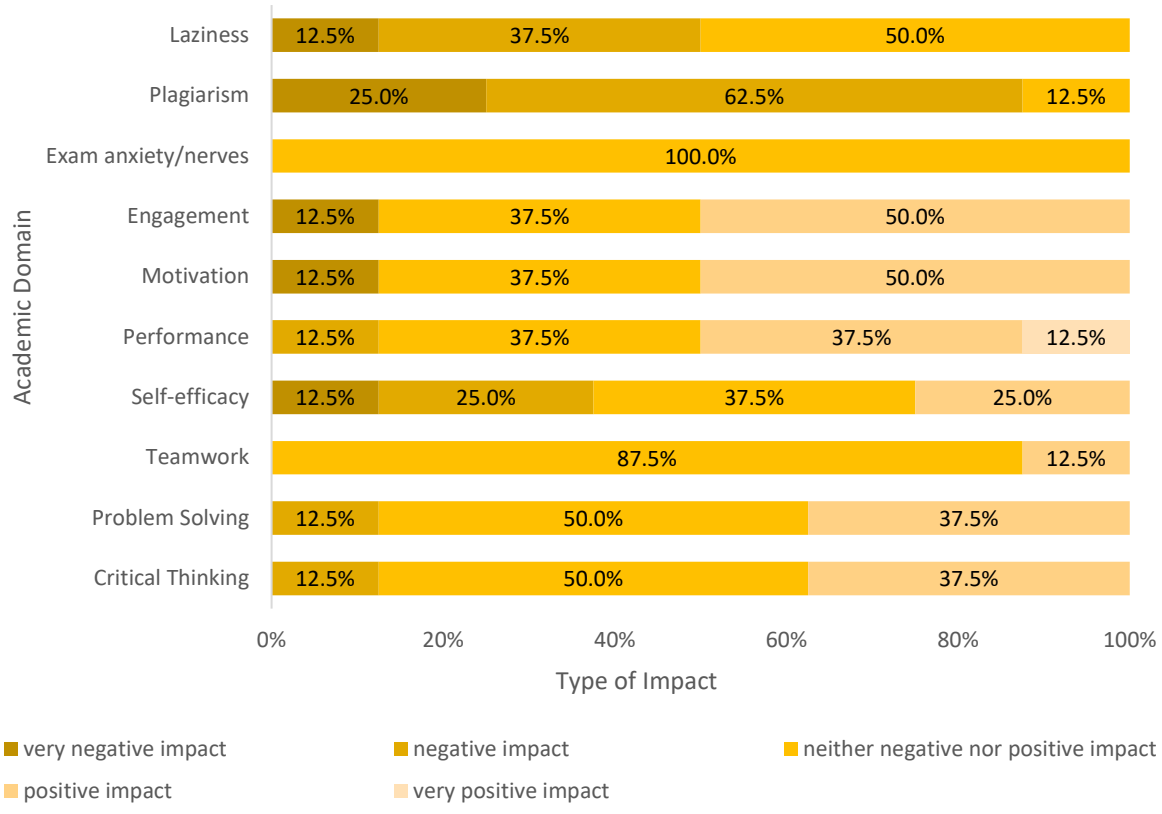
Perceived Impact of AI-Use on Students’ Learning Outcomes



When asked about the expected impact on a selected range of academic domains, there were varied responses from participants. Figure 37 indicates a very positive impact was seen for *Performance* alone (12.5%). No positive impact was seen for *Exam anxiety/nerves, Plagiarism* and *Laziness*. There was some level of neutrality for all domains. No negative impact was seen for *Teamwork* and *Exam anxiety/ nerves*. A very negative impact was seen for *Self-efficacy* (12.5%), *Motivation* (12.5%), *Engagement* (12.5%), *Plagiarism* (25.0%) and *Laziness* (12.5%). The highest combined negative responses were indicated for *Plagiarism* (87.5%).

Figure 37

Perceived Impact of AI-Use on Academic Domains



Qualitative findings

The responses of participants were categorized under various topics as presented below.

Theme 2.1: Perceived Benefits of AI-integration. Approximately 57% of the responses to this topic referred to text-related support as a major benefit. Other benefits included support with language, literature research, and creation of pictures and presentation slides. It was suggested that the tools could enhance learning in various ways, such as with brainstorming, pre-lesson preparation, and the generation of practice questions. A participant stated, “The tools are coming anyway. Therefore, students should learn to use them effectively and correctly. Additionally, they can take on tasks that are not part of the core competencies of their studies.” It was furthermore mentioned “Like all tools, these can provide support. We need to learn how to empower students to use the tools effectively.” Another participant suggested that “Ethical and competent handling is a skill that must be taught.”

Theme 2.2: Concerns about AI-Integration. 85.7% of the responses included concerns about students’ unreflective use of AI tools. One participant expressed:

> Demotivation of students, as AI can do many things better -- why should I study at all? The battle of human laziness against the joy of learning. Similar to an e-bike: one could also ride without electrical assistance, but it's much nicer with it. So, people gladly let the motor run along.

Some concerns were centred on contextual use as well as fact-checking, for example “It requires a high level of expertise to distinguish between meaningful and non-meaningful uses.” A participant indicated that AI-use could have either a positive or negative impact, stating “The tools can be used to promote or prevent own thinking. The former is good, the latter is not.” Other concerns were raised about the impact of AI on ethical and academic integrity. These included the risk of plagiarism, the challenge of differentiating between a student’s own effort and what was AI-generated and how to assess performance. One participant expressed, “AI performance could be

sold as one's own performance; personal performance will no longer be recognizable; certain performance records will no longer be assessable." Another participant expressed a similar concern that "Students will quickly produce content without acquiring in-depth knowledge and understanding."

Theme 2.3: Ethical Guidelines. When asked what kind of ethical guidelines should be provided for students regarding their use of AI for assignments, 50% of the participants indicated a need for students to not only responsibly use AI, but also know how to declare this use. One participant indicated that they were unaware of existing guidelines.

Theme 2.4: AI-relevant Skills. The responses of 62.5% of the participants to the question "Which AI-relevant skills do you think are particularly important for education and training?" were summed up as *User Responsibility*. This encompassed points such as critical reflection of use (emphasized in 60% of the responses), using AI in a goal-oriented way to further develop oneself, and having a basic understanding of AI functionality. A participant stated, "Accurate mental models are essential for effective use." Another participant indicated that "Getting to know the strengths and weaknesses of AI tools while learning and practicing critical and responsible use of AI tools is important".

Theme 3: Usefulness of AI for Lecturers

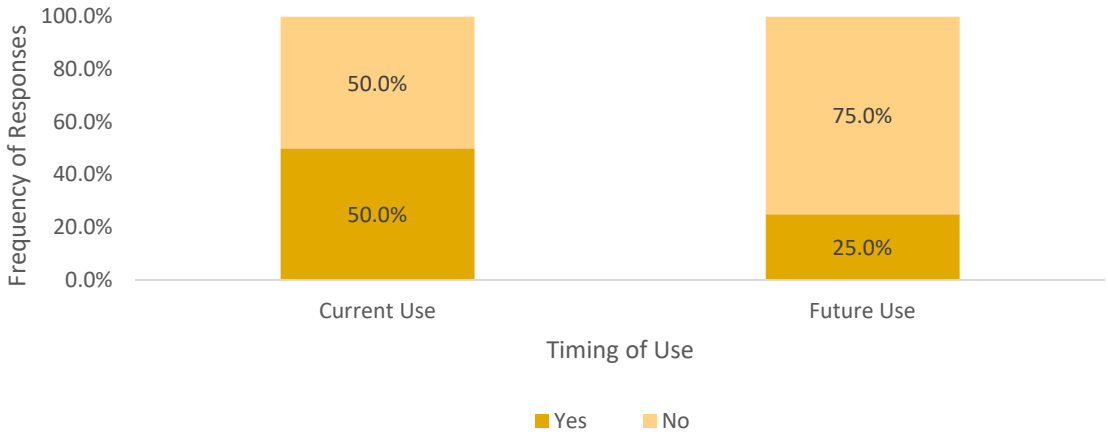
This theme focused on the perceived benefits for the lecturers and the support they needed regarding the integration of AI in the academic setting.

Quantitative findings

Figure 38 indicates an equal proportion of participants either used or did not use AI tools for the planning and/or structuring of their courses at present. 25% of those who did not use AI tools planned to eventually use them as support for this task.

Figure 38

AI-Support for Planning and/or Structuring Courses



Qualitative findings

When asked how AI tools supported and/or could support with the planning and/or structuring of courses, responses included the creation and optimization of text, simplifying explanations, researching topics and finding literature, generating examination questions, optimizing feedback, and generating ideas and use-cases. It was indicated by a participant that AI tools also provided support when using other data-analysis programs such Jamovi and Python during teaching and learning sessions. Another indicated they barely used AI tools hence had no perceived support for teaching and learning.

50% of the participants responded to a final question asking for specific information or training needs to support AI-integration. Whereas one participant expressed there were enough resources available, others mentioned a desire for an overview of the types of tools, their strengths

and limitations, and how to handle them. Further desires for practice sessions to learn responsible use as well as know the challenges of thoughtless use of AI were expressed.

In a nutshell, the findings from the survey provide various insights into the perspectives of lecturers regarding the integration of AI in the academic setting. The combined quantitative and qualitative outcomes revealed multi-faceted viewpoints on the motivations and barriers to AI-integration and factors that need to be considered to better support not just the lecturers themselves, but their students as well.

CHAPTER 5: DISCUSSION

This thesis focused on exploring the perspectives of both psychology students and lecturers regarding the integration of various AI tools in the academic setting. Students across the 4 academic levels shared not only their opinions regarding this integration, but also how their experience collaborating with AI tools for academic/scientific writing shaped their current viewpoints and influenced their attitudes. These were explored using a mixed methods approach in which surveys with open- and closed-ended questions and interviews were utilized. These outcomes and their connection to existing literature are discussed in this chapter.

Interpretation of Findings

H_1: BSc students will feel more confident about their digital competency after the introductory seminar.

The BSc students indicated a greater perceived confidence in their ability to meaningfully use AI tools at the end of the introductory seminar, results that were statistically significant. They attributed their increased perception of digital competence to the experience gained from the seminar. The opportunity to experiment with different AI tools in groups may have helped some students better explore and navigate these tools, increasing their digital literacy. According to Bitzenbauer (2023), digital literacy was one of the most important factors for AI-integration and this could best be developed through practical integration. By using a think-pair-share approach, students in his study supported one another with using AI for their tasks (Bitzenbauer, 2023).

This hypothesis bore a thematic relationship with the findings categorized under ***Facilitating Conditions*** (which references both digital literacy and the availability of external resources to support AI-use); thus, these will be discussed here as well to create continuity.

Comparatively more CAS and MAS students were neutral about their perceived competence whereas more BSc and MSc students felt very sure. Although the differences in responses were not significant, when asked during the interviews to estimate their perceived competence out of 5, the CAS-MAS group mostly gave lower ratings (below 3) whereas the BSc-MSc group mostly gave higher ratings (3 and above). Whereas some students gave a low rating because of their perceived lack of knowledge of many AI tools, others gave a higher rating because of their perceived expertise with specific AI tools. One lecturer indicated that meaningful use of AI required some level of expertise. These findings were consistent with studies that highlighted the importance of digital literacy which included knowing how to correctly apply AI (Elkhodr et al., 2023; Firat, 2023b; Southworth et al., 2023). Some students were concerned about digital inequities and believed training on AI would create a similar starting point for all. Comparatively older students felt they were not as tech-savvy as the younger students and were rather used to the traditional methods of learning. To address these, Elkhodr et al. (2023) and Firat (2023b) indicated that training and other resources should be curated for different academic levels based on their academic needs and level of digital literacy.

An equal proportion of CAS and MAS students felt they were either adequately or inadequately trained to use AI tools for academic activities. Majority of students from the BSc-MSc group felt inadequately prepared. The differences between responses of both groups were statistically insignificant but students provided reasons for their responses. Bitzenbauer (2023) and Shoufan (2023) after testing AI-integration pointed out the importance of having enough knowledge for AI-use, including prompting techniques, which required training and exploration. Students in this thesis desired further insights on the technical functioning of AI tools (i.e. the algorithms behind them), an overview of a wider range of AI tools, more examples of use-cases,

further guidance on prompting techniques, more practice sessions, and further guidance from the university as well as lecturers regarding the dynamics of use behaviour. Some lecturers indicated their own desire for an overview of the types of tools, their strengths and limitations, and how to handle them. A few students described ideal formats for being trained and informed on AI which included modules focused on AI, workshops, tutorials, guidelines, and so on. Only a few students felt the resources provided in the respective settings were enough and thus, needed no further support. For many students, meaningful use of AI was important to learn, and they wanted clearer guidelines on the boundaries of use including declaration of use. These findings are consistent with other studies whereby importance for ethical guidelines and a definition of acceptable degree of use was expressed (Dwivedi et al., 2023; Elkhodr et al., 2023). Furthermore, students and lecturers alike reported that critical thinking skills were necessary for AI-use, reiterating the findings of other studies (Fuchs, 2023; Tlili et al., 2023).

H_2: Students will prefer interactions with people for academic work related to "Understanding New Concepts" and "Presentations".

BSc students' preference for human support for understanding new concepts decreased after the introductory seminar whereas that for presentations increased, differences that were statistically insignificant. At least 50% of the students across the 4 levels preferred human support for both understanding new concepts and presentations, with a higher preference for understanding new concepts. Many students across the 4 levels expressed surprised over the results for presentations as they believed this could be done better by AI, but the results for understanding new concepts were accepted. Most lecturers indicated that AI could support presentations but there were less responses for understanding new concepts. Sullivan et al. (2023) indicated that activities such as presentations could not be mimicked by AI, potentially explaining

the increase in preference for human-support at the BSc level. While AI was said to have a positive impact on deepening learning, the understanding of new concepts required initial inputs from lecturers to establish a knowledgebase before students could seek further learning support from AI (Shoufan, 2023; Tajik & Tajik, 2023).

Elkhodr et al. (2023) suggested a differentiation of tasks for which students would prefer human- over AI-support. Evaluating the other academic activities, lecturers saw AI-support for summarization of scientific content, language translation, and writing and optimization of text, and suggested more human-support for research, applying new concepts, deepening learning, and exam preparations. It was shown that AI offered more support with customizing learning and tracking goals, enhancing language skills, and customizing practice assessments (Cotton et al., 2023; Southworth et al., 2023), activities for which students in this thesis surprisingly preferred human-support. Some students believed AI could support these tasks quite well while others were a bit sceptical due to the need to verify the outputs and complexity of the content being worked with.

Taking all results into consideration, there was a general preference for human-support for many academic activities. Bitzenbauer (2023) indicated that learning was a social process and could not be replaced by the efficiency of AI. Other studies supported this finding and suggested a complementary human-AI approach be used for teaching and learning (Dai et al., 2023; Elkhodr et al., 2023; Shoufan, 2023).

H_3: Students will be interested in acquiring digital competencies for their current/future jobs.

Although most students at the BSc level saw a relevance for acquiring digital competencies for their professional careers after the introductory seminar, there was also an

increase in disagreement, although not statistically significant. Qualitative findings revealed that students became more aware of the benefits AI presented for certain professional settings, but not all, which influenced increased agreement and disagreement. Furthermore, a few students indicated a preference to work without AI. On the other hand, most students at the CAS and MAS levels indicated an importance of knowledge transfer from education to work as many already actively utilized some of the AI tools in the office. Although the difference in responses between the BSc-MSc group and CAS-MAS group was insignificant, it is assumed that the level of professional experience impacted these perspectives. Moreover, all lecturers indicated that the knowledge of AI was relevant for students' careers. Shoufan (2023) found that students perceived a moderately negative impact of AI on jobs as there was concern about AI-replacement. These perceptions were however dependent on the field of work (Dwivedi et al., 2023). Nevertheless findings from other studies indicated that AI digital literacy was necessary for future workforce needs (Rudolph et al., 2023; Southworth et al., 2023). Aligning with these findings, some students in this thesis indicated awareness of a greater future impact of AI at the workplace and wanted to be prepared for this.

General Use of AI

ChatGPT remained the most popularly used AI tool amongst students across the 4 levels and the lecturers. DeepL write was the second most popularly used AI tool. The non-use of AI tools amongst BSc students significantly reduced after the introductory seminar and is attributed to AI-use during the seminar. Another interesting but statistically insignificant find was after the seminar, more AI tools not listed in the presented range had been used. This could have been influenced by the group collaboration during the seminar through which students may have shared their own AI discoveries. The frequency of use of ChatGPT increased from a monthly to weekly

and daily basis, which was statistically significant. Students who took part in the interviews attributed this to the seminar. Whether this use behaviour was the same outside the seminar setting cannot be confirmed for all students, however many interviewees expressed continued use of ChatGPT for other courses and assignments.

The usefulness of both ChatGPT and DeepL Write was rated high by most BSc and MSc students, whereas most of the CAS and MAS students rated this as neutral, with this difference in responses from both groups flagged as statistically significant. Comparing DeepL Write to ChatGPT, more BSc and MSc students felt neutrally about it, while more CAS and MAS students rated its usefulness much higher than ChatGPT. This finding was however statistically insignificant. Most of the BSc and MSc students attributed their use of ChatGPT to its popularity amongst their peers and in the media and expressed general satisfaction with the tool despite its limitations. On the other hand, more CAS and MAS students expressed their disappointment with ChatGPT and a relatively stronger satisfaction with DeepL Write. Reasons for use and discontinued use are discussed under the next themes, *Effort Expectancy* and *Performance Expectancy*.

Effort Expectancy

Most students perceived the effort required to use AI tools as minimal as these were easy, user-friendly, straightforward, and versatile. Furthermore, the effort required to use AI was linked to the increased productivity and efficiency it offered, such as quick access to a vast amount of information and the use of keywords or questions to simplify concepts, enhance learning and resolve problems. These findings are confirmed by numerous studies which also acknowledged the importance of supported exploration to reduce effort required for use (Dongmo et al., 2023; Menon & Shilpa, 2023; Romero Rodríguez et al., 2023; Yilmaz et al., 2023).

On the contrary, other students felt overwhelmed as much effort, including time, was required to not just learn how to use AI tools, but also explore the variety of options and cross-validate the outputs delivered by the tools. These challenges led to the discontinued use of some AI tools for some students. While findings from Tlili et al. (2023) indicated poor digital literacy typically negatively impacted the perceived effort required, students in this thesis did not attribute the perceived effort to poor literacy, but the effort required to further develop literacy.

These conflicting perspectives across the 4 academic levels after their experience collaborating with AI tools are not presented in most studies, especially as the studies were not based on actual integration and focused on a smaller scope of students (Dongmo et al., 2023; Romero Rodríguez et al., 2023; Strzelecki, 2023; Yilmaz et al., 2023). The variance in findings discussed under the first hypothesis above (facilitating conditions) are assumed be connected to the findings presented here. This assumption is supported by Venkatesh et al. (2003) who reported that EE was mediated by facilitating conditions. One observation, however, is that although facilitating conditions mediated EE, effort was equally required to build that digital competency for AI use, indicating a theoretical gap that does not acknowledge a possible reciprocal relationship between both factors.

Performance Expectancy

Many students were impressed by the quality of outputs generated by AI and the support it provided in enhancing their own productivity. The AI tools consistently provided good answers to questions asked and simplified complex learning content. They also assisted the efficiency of students' workflow, especially for repetitive, redundant, or effort/time-consuming tasks, such as optimizing text, searching for literature, summarizing of text, and language translation. Lecturers reported direct benefits for teaching and learning, which included researching topics and finding

literature, generating examination questions, optimizing feedback, support with other data analysis tools, generating ideas for use-cases, and simplifying explanations. Some of them believed that the use of AI would help students focus better on core competencies of tasks as well. These findings are confirmed by numerous studies in which the same outcomes were listed (Dwivedi et al., 2023; Fauzi et al., 2023; Firat, 2023b, 2023a; Halaweh, 2023; Kalla & Smith, 2023, 2023; Rudolph et al., 2023; Strzelecki, 2023; Tajik & Tajik, 2023).

In contrast, other students were either sceptical or disappointed by the quality of outputs and felt AI performed poorly for some tasks and thus were unsuitable for them. Examples included the changed context of some text translated from one language to another and the different responses provided to the same question. Another challenge was the similar and obvious tone of outputs, which raised concerns of whether this was ideal for student use as it could impact their performance on written assignments. A few students in this thesis reported discontinued use of some of the AI tools due to these reasons. Other students indicated that they did not stop using AI tools but were more careful when they did. Some lecturers discontinued their use of some AI tools due to their level of development and comparative functionality. These findings are aligned with those presented by Tlili et al. (2023), who determined that these challenges negatively impacted PE and subsequently impacted use behaviour. In their study, Chatterjee & Bhattacharjee (2020) reported that PE had no significant impact on the attitudes of users, although this thesis suggests otherwise (to be discussed under *Acceptance and Change in Attitudes*).

One interesting observation was the connection between PE and Facilitating Conditions, in that, outputs were dependent on the prompting techniques applied by students. Theoretically, this observation has not been highlighted.

Social Influence

For many students, important reference points included people within their academic, professional, and personal environments namely: other students, lecturers, work colleagues, and the university itself. Based on the reports of the students, there seemed to be both direct and indirect social influences on their intention to use AI. For example, an indirect influence was expressed as the possibility of being at a disadvantage performance-wise if one did not use AI tools while other students used AI. A direct influence was expressed as feeling pressured to use AI because it was a hot topic or being used by colleagues. The latter influence was confirmed by Shoufan (2023). Some students were excited that lecturers were encouraging AI-use, which motivated their own use behaviour and wanted further support and guidance from both lecturers and the university. While many studies indicated stronger resistance from lecturers (Dongmo et al., 2023; Firat, 2023a; Halaweh, 2023; Kalla & Smith, 2023), lecturers in this thesis believed students in empowering students to use AI as the knowledge was relevant for both the current times and future. The findings from this thesis align with studies that suggested the encouraged AI-use be met with support from the educational institution as well (Elkhodr et al., 2023; Firat, 2023b; Shanto et al., 2023). This indicates a possible thematic connection between this factor and *Facilitating Conditions*.

Acceptance of AI-Integration and Change in Attitude

There was a statistically significant increase in acceptance of AI-integration amongst BSc students. Self-reports attributed the shift in responses to the positive experiences and knowledge gained during the seminar, with a few acknowledging the influence of lecturer-encouragement on their own acceptance to integrate AI (an indication of social influence). Although a statistically insignificant difference, none of the CAS and MAS students disagreed with AI-integration even

though a few BSc and MSc students did. Across the 4 academic levels, this acceptance was connected to the benefits collaboration with AI tools provided (such as text optimization, research support) and could provide (such as quick access to psychological databanks) (an indication of performance expectancy). This acceptance was also transferred to the perceived relevance of AI tools for the field of psychology. Many of the students saw potential for adding value, while a few found AI irrelevant for psychology, including during their studies. Some students reported an attitudinal change as they became less sceptical and more open-minded, increasing their use behaviour. Others declared there was no influence on their attitudes towards AI and they remained as positive or as critical as before the semester. In essence, both cases were associated with their experience during the semester.

All lecturers found student-use of AI tools reasonable, and many lecturers were either already using AI or planned to use AI to support the planning and/or structuring of their courses due to the benefits the tools offered (listed under *Performance Expectancy*). Studies have shown there was greater acceptance for AI-integration amongst lecturers who benefitted from AI-support for their tasks and saw opportunities for enhancing the teaching and learning experiences (Bitzenbauer, 2023; Cotton et al., 2023; Dai et al., 2023; Tajik & Tajik, 2023). Whether an attitudinal change of lecturers towards AI-use was impacted by experience can only be assumed.

As reported by Chatterjee & Bhattacharjee (2020) and Strzelecki (2023), acceptance of AI-integration was influenced by experience, effort expectancy, performance expectancy and facilitating conditions. Dwivedi et al. (2023) and Shoufan (2023) reported some level of social impact on acceptance. Furthermore, Chatterjee & Bhattacharjee (2020) reported positive attitudes towards AI influenced the acceptance of AI-integration, but this factor had been excluded from most studies. In their study, Dwivedi et al. (2023) reported the need to include and explore attitude

as a factor that mediates AI-integration. Theoretically, the perceived relevance of AI for the field of study was not considered, possibly because focus was typically on task-support and productivity independent of what was being studied.

Concerns about Integration

The differing concerns expressed by students and lecturers generally looked at what AI-integration meant for the assessment of performance, the kind of impact AI-use would have on both students and learning outcomes, and data privacy. There were questions from students on whether performance records would shift from written to verbal tests, with one student in agreement with this shift despite the recognition of challenges this could pose for lecturers. Various studies recommended a change in format for performance assessment (Cotton et al., 2023; Dwivedi et al., 2023; Rudolph et al., 2023; Sullivan et al., 2023). However Shanto et al. (2023) suggested the need to understand how to balance traditional assessment methods and AI-integration without losing the essence of knowledge, skill, and attitudinal development as desired learning outcomes. Furthermore, Neumann et al. (2023) indicated that educational institutions would face numerous costs if assessments were to be changed.

The risk of academic devaluation was raised by a student and others were concerned about academic inequity created by use vs non-use of AI. This concern for academic devaluation due to the oversimplification of necessary challenges was highlighted by Cotton et al. (2023) as well. Moreover, they as well as Tlili et al. (2023) highlighted that AI could both bridge academic inequities and create them thus the topic of fairness needs to be addressed.

With regards to learning and impact on users, there was concern expressed by both students and lecturers that use would be unreflective, important skills would be lost, and that learning would be superficial. In addition to these, the risk of plagiarism and differentiating a

student's performance from AI were presented as challenges. Other studies have also expressed concern about the negative impact of AI-use on academic integrity (Cotton et al., 2023; Tlili et al., 2023). Concerns with data privacy raised by students in this thesis were indicated in various studies (Firat, 2023a; Kalla & Smith, 2023; Shoufan, 2023). Most lecturers believed the most important skill for students to develop was user responsibility for the purpose of efficient integration of AI in the academic setting. Studies have suggested that this could be best facilitated by lecturers as well as institutional training and guidance (Elkhodr et al., 2023; Firat, 2023b; Fuchs, 2023).

Possible Effects of Integration

There was a total of 10 domains for which lecturers and students had to indicate the kind of impact AI-integration would have on them. At the BSc level, there was some increase in the perceived positive impact of AI-integration on Critical Thinking, Self-efficacy, Performance, Motivation, and Exam Anxiety/Nerves. Likewise, there was some increase in the perceived (very) negative impact on Critical Thinking, Problem Solving, Performance, Motivation, Exam Anxiety/Nerves, and Plagiarism. The differences in responses were statistically insignificant.

For students across the 4 levels, comparatively higher negative impact was perceived for Laziness, Plagiarism, and Critical thinking, whereas for lecturers, this perception was for Self-efficacy, Plagiarism and Laziness, with the highest negatively impacted domain being Plagiarism. Amongst students, comparatively higher positive impact was perceived for Motivation, Performance, and Problem solving, whereas for lecturers, this perception was for these domains in addition to Engagement and Critical Thinking, with the highest positively impacted domain being Performance. Students expressed neutrality for Exam anxiety/nerves, Engagement, Self-efficacy,

and Teamwork. An equal proportion of lecturers rated the impact of using AI on learning outcomes as either positive or (very) negative.

These conflicting perspectives are representative of an academic dilemma. According to some studies, AI-use was reported to negatively impact critical thinking, problem solving, performance and general learning outcomes (Fuchs, 2023; Rudolph et al., 2023; Sullivan et al., 2023). Other studies have reported that AI-use would trigger the development of critical thinking skills, engagement, collaboration, motivation, and problem solving, thereby positively influencing the learning outcomes (Bitzenbauer, 2023; Dongmo et al., 2023; Fauzi et al., 2023; Neumann et al., 2023; Qadir, 2022; Tajik & Tajik, 2023).

A variety of reasons were provided across the 4 levels for the results. One common theme across the domains was the emphasis on an internal locus of control, i.e. the kind of impact was dependent on the attitude and approach of the individual themselves. Furthermore, the collective explanations for the (very) negative responses were summed up as the risk of students transferring responsibility from self to the AI tools. The collective explanations for the (very) positive responses highlighted the benefits collaborating with AI provided, such as increased efficiency, support with learning, amongst others. Unfortunately, very few studies have looked at the impact of AI-integration on these domains. Amani et al. (2023) suggested that the impact of AI-use on each of these domains listed above should be evaluated on a longitudinal basis.

Practical Implications

Based on the findings of this thesis, training is important for students at all levels to promote digital literacy. Suggestions from students included info-blocks, video tutorials, and workshops. There was a preference for interactive sessions in which live testing and discussions could be held. The format of this training could be further explored with the wider population to

understand what would be most favourable and better meet the needs of students at the different academic levels. Secondly, the content of the training sessions should provide not just an overview of AI, the variety of tools, and limitations and benefits, but also prompting techniques and contextual use cases for the variety of AI tools relevant for the academic program. Moreover, guidelines for use need to be provided as a reference manual. This should include the university-accepted AI tools, how to declare use, and the acceptable degree of use. Policy updates need to be well communicated to ensure both student- and lecturer-awareness. It is important that students have support to overcome initial apprehensions and maximize the potential of AI as well as ensure digital equity.

Pertaining lecturers, an alignment should be established to ensure that regulations for use are not fundamentally contradictory. Should differences exist in the acceptable degree of use per lecturer and/or module, it should be communicated to the students. It would benefit lecturers to have curated training sessions with hands-on practice, knowledge of use-cases, and understanding of implications of AI-use for the field of psychology to better support their students.

Whether the assessment of performance needs to be changed could create more challenges for both lecturers and students and need to be critically evaluated. It is important to remember that academic writing skills are still necessary, making oral assessments inadequate in this regard. Withal, there is a need to define an acceptable degree of AI-use to reduce performance inequities, especially when students choose not to incorporate AI-support. Transparency is required to alleviate concerns of such students.

Theoretical Implications

Theoretically, the UTAUT model provides empirical evidence on factors that influence the acceptance of AI-integration in the academic setting. However, this evidence does not

conceptualize why and how these factors influence perspective shifts, nor does it provide feedback on the exact needs and concerns of users to facilitate integration. The approach of this thesis highlights the importance of uncovering the nuanced perspectives and experiences of users to better understand changing attitudes and behaviours. There is also a need to consider the moderating influence of experience and concerns on behaviour or attitudinal change over time.

On the topic of generation-based differences, although not a core focus of this thesis, the qualitative findings revealed that on one hand, there were some concerns about digital literacy and a generational divide, and the reciprocal interaction between being used to traditional learning methods and having to adjust to AI-integration. On the other hand, relatively older students who had more work experience saw a greater knowledge transfer from the academic to professional setting compared to younger "new" students. These differing voices could be indicative of the need to understand how academic experience and generational differences could impact attitudinal change towards AI-integration and how AI-integration may need to be conceptualized.

A last point to consider is the role of human support. The findings reveal that although students generally accept AI-integration, their preferences for AI-support depends on the academic activity. Lecturers also pointed out which activities could be well supported by AI. Theoretical frameworks may need to consider how acceptance and preferences are connected as these could both potentially impact use behaviour.

Limitations

Although there were different AI tools presented, most students generally based their responses on ChatGPT and DeepL Write with only a few referencing other AI tools. The author did not further investigate the experiences with the other tools in the list. This makes it to determine whether the perspectives shared are for all AI tools or just the popular ones.

An intercoder reliability was not established for the coding of the qualitative data points, increasing the possible impact of potential biases during the thematic content analysis. However, the use of data triangulation supported the reliability of the analysis to an extent (Shoufan, 2023). Furthermore, the surveys were not validated prior to use as the goal was to uncover first insights on the topic under investigation.

Although the mixed methods approach has many strengths, it was a complex design that required critical evaluation to determine how to attribute weight to the data strands. With prioritization of the qualitative data, less emphasis was placed on the statistical analysis of some results and the qualitative inputs dominated the findings. The qualitative codes were also not quantified. Furthermore, there was no determination of relationships between variables despite the indication of thematic overlaps.

By not following the traditional quantitative approach of the UTAUT model, some factors were not equally represented. Additionally, the causality of the perspective shifts was based on the self-report of the students and not on statistically significant findings for some cases.

Recommendations for Future Research

Future studies could focus on further exploring the specific experiences students have with the variety of AI tools listed in this thesis. This way, a new approach to (re)introduce some of these tools could be based on the feedback from the students and would assist the reduction of reliance on ChatGPT, especially for tasks that could be better supported by other AI tools.

In addition to this, more focus could be placed on the quantification of qualitative data points such as code frequencies or weight attribution to determine whether differences in qualitative responses are significant, such as the pre-post assessment of topics like concerns at the BSc level. Furthermore, future studies could consider using a paired sample approach to measure

and map the perspectives of the same participants before and after receiving an intervention. This would reduce variability in the data and establish a statistical relationship that could better explain causality. In addition to this, correlational links between the themes could be explored as there was some evidence of overlaps between some of the topics.

As a final suggestion, longitudinal studies could be conducted to observe changes in perspectives and use behaviour over time as well as assess the long-term impact of AI-integration on learning and attitudes.

Conclusion

This thesis focused on exploring the perspectives of both psychology students and lecturers on the integration of AI in the academic setting. This was motivated by the lack of research done on the practical implementations within the discipline of psychology and was guided to an extent by the UTAUT framework. The main factors of the UTAUT model each seemed to play a role in influencing and shaping these perspectives and this thesis was able to uncover why and how. While there were mixed opinions about the factors *Effort Expectancy* and *Performance Expectancy*, this thesis was able to determine the roles the factors *Facilitating Conditions* and *Social Influence* played in the use behaviour and general acceptance of AI-integration.

There were both quantitative and qualitative indications of perspectives shifts amongst some students across the various levels. For those at the BSc level, a few of these were statistically significant such as the perceived increase in digital competence. Many students across the 4 levels exhibited an increased acceptance of AI-integration as well as increased use behaviour which were attributed to the collaboration with AI tools for their assignments. Although they felt more confident about their AI-skills, students acknowledged that there was still more to learn and

would prefer more support with this from their lecturers and the university. Lecturers were very positive about AI-integration and indicated no resistance on the subject.

Despite the introduction of a range of AI tools, ChatGPT and DeepL Write remained the most popularly used tools, also amongst lecturers. Various reasons were given for the use or discontinued use of AI tools, with most participants indicating a need for critical approach towards usage. Furthermore, there was a greater preference for human support for many academic activities, especially those deeply connected with the initial phase of the learning process. The desire for human support was also extended to learning how to meaningfully use AI in the academic setting. Lecturers equally saw opportunities for AI-support with some academic activities and were positive about student use. Albeit there was some hesitance about AI-adoption for their own tasks including structing their courses. Although students seemed to be comparatively more sceptical about AI-integration, both groups of stakeholders indicated an importance for knowledge transfer to the professional setting.

Concerns raised by both groups would also need to be addressed as these could impact not only AI-integration, but satisfaction with the university's approach. Both groups additionally expressed their perceptions on the kind of impact AI-integration could have on different aspects of the academic program and the results revealed that students are aware of some challenges this could pose. Nevertheless, there was expressed desire for further training on the subject to ensure efficient and ethical use of AI tools for academic work. In essence, higher education institutions should consider including both students and lecturers in the decisions and design of AI-integration to ensure the needs of both groups are met and concerns are addressed. Strategies could be tested, but feedback from students across different academic levels are critical to shape the direction and effectiveness of integration.

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Appendix A: Surveys

Survey 1: BSc Pre-assessment

Demografie

1. Bitte geben Sie Ihr Alter ein.
2. Bitte wählen Sie Ihr Geschlecht aus.
    i. Weiblich
    ii. Männlich
    iii. Divers
3. In welchem Studiengang sind Sie?
    i. Bachelor AOP Vollzeit
    ii. Bachelor AOP Teilzeit
    iii. Bachelor AOP Flexzeit
    iv. Bachelor WP Vollzeit
    v. Bachelor WP Teilzeit
    vi. Bachelor WP Flexzeit
    vii. Master AOP Vollzeit
    viii. Master AOP Teilzeit
    ix. Master WP Vollzeit
    x. Master WP Teilzeit
4. In welchem Semester studieren Sie?
5. In welcher Gruppe sind Sie?
    i. A
    ii. B
    iii. C
    iv. D
    v. E

Erfahrung mit KI-Tools

6. Welche der folgenden KI-Tools kennen Sie und welche haben Sie verwendet?

   a. Welche KI-Tools kennen Sie: *ChatGPT, AI Writer, Elicit, Research Rabbit, SciSpace, Copilot, GPTZero, Sonstiges, Keines*
   b. Welche KI-Tools haben Sie schon verwendet: *ChatGPT, AI Writer, Elicit, Research Rabbit, SciSpace, Copilot, GPTZero, Sonstiges, Keines*
7. Gibt es ein anderes KI-Tool, das Sie kennen/verwendet haben?

Falls ein Tool benutzt wurde:

8. Wofür haben Sie die KI-Tools verwendet? *(je nach ausgewählten Tools)*
9. Wie oft verwenden Sie die KI-Tools? *(je nach ausgewählten Tools)*
   i. Nie
   ii. Einmal pro Tag
   iii. Mehrmals pro Tag
   iv. Einmal pro Woche
   v. Mehrmals pro Woche
   vi. Einmal pro Monat
   vii. Mehrmals pro Monat
10. Wenn Sie eines der oben genannten KI-Tools nicht mehr verwenden, geben Sie bitte an, welches es ist, und begründen Sie dies.

Falls ein Tool nie benutzt wurde:

11. Bitte begründen Sie, warum Sie keine KI-Tools verwenden.

Perspektiven

12. Wie sicher sind Sie, dass Sie KI-Tools für das Psychologiestudium an der FHNW sinnvoll nutzen können?
   a. Überhaupt nicht sicher
   b. Nicht sicher
   c. Neutral
   d. Etwas sicher
   e. Sehr sicher
13. Bitte erläutern Sie, für was Sie KI-Tools im Psychologiestudium sinnvoll einsetzen könnten.

14. Inwieweit stimmen Sie diesem Satz zu: „Die Einbeziehung von KI-Tools in das Psychologiestudium an der FHNW ist sinnvoll.“
    a. Stimme überhaupt nicht zu
    b. Stimme nicht zu
    c. Neutral
    d. Stimme zu
    e. Stimme völlig zu
15. Welche Bedenken haben Sie bei der Nutzung von KI-Tools im Psychologiestudium an der FHNW?
16. Welche Vorteile erwarten Sie durch die Nutzung von KI-Tools im Psychologiestudium?
17. Welche Herausforderungen erwarten Sie durch die Nutzung von KI-Tools im Psychologiestudium?

Aufgaben und Präferenzen

18. Für welche studiumsbezogenen Aufgaben bevorzugen Sie die Unterstützung durch einen Menschen anstatt durch KI-Tools?
    i. Zusammenfassungen von wissenschaftlichen Arbeiten (z.B. Artikel, Fachbücher, usw.)
    ii. Sprachliche Übersetzung
    iii. Verstehen neuer Konzepte
    iv. Anwenden neuer Konzepte
    v. Vertiefung von Lerninhalten
    vi. Präsentationen
    vii. Vorbereitung auf Prüfungen
    viii. Sonstiges (bitte angeben)
19. In welchen Bereichen erwarten Sie positive bzw. negative Auswirkungen für das Psychologiestudium durch den Einsatz von KI-Tools?
    a. *Sehr negative Auswirkung*
    b. *Negative Auswirkung*
    c. *Weder negative noch positive Auswirkung*
    d. *Positive Auswirkung*

e. *Sehr positive Auswirkung*
    i. Kritisches Denken
    ii. Problemlösung
    iii. Teamarbeit
    iv. Selbstwirksamkeit
    v. Leistung
    vi. Motivation
    vii. Engagement
    viii. Prüfungsangst
    ix. Plagiarismus
    x. Faulheit

Berufliche Einfluss

20. Glauben Sie, dass das Wissen über den Einsatz von KI-Tools auch für Ihre (zukünftigen) beruflichen Tätigkeiten nützlich sein wird?
    a. Stimme überhaupt nicht zu
    b. Stimme nicht zu
    c. Neutral
    d. Stimme zu
    e. Stimme völlig zu
21. Bitte begründen Sie Ihre Antwort.

Trainingswünsch

22. Welche Informationen oder Schulungen zum Thema KI würden Sie sich wünschen?

Survey 2: BSc Post-assessment

Demografie

1. Bitte geben Sie Ihr Alter ein.
2. Bitte wählen Sie Ihr Geschlecht aus.
    i. Weiblich
    ii. Männlich

iii. Divers

3. In welchem Studiengang sind Sie?
    i. Bachelor AOP Vollzeit
    ii. Bachelor AOP Teilzeit
    iii. Bachelor AOP Flexzeit
    iv. Bachelor WP Vollzeit
    v. Bachelor WP Teilzeit
    vi. Bachelor WP Flexzeit
4. In welchem Semester studieren Sie?
5. In welcher Proseminargruppe sind Sie?
    i. A
    ii. B
    iii. C
    iv. D
    v. E

Erfahrung mit KI-Tools

6. Welche der folgenden KI-Tools haben Sie verwendet?

    ChatGPT, Consensus AI, Research Rabbit, SciSpace, Litmaps, DeepL Writer, Microsoft Bing, Google Bard Sonstiges, Keines

7. Gibt es ein anderes KI-Tool, das Sie verwendet haben?

Falls ein Tool benutzt wurde:

8. Wofür haben Sie die KI-Tools verwendet? *(je nach ausgewählten Tools)*
9. Wie oft verwenden Sie die KI-Tools? *(je nach ausgewählten Tools)*
    i. Nie
    ii. Einmal pro Tag
    iii. Mehrmals pro Tag
    iv. Einmal pro Woche
    v. Mehrmals pro Woche
    vi. Einmal pro Monat
    vii. Mehrmals pro Monat

10. Wenn Sie eines der oben genannten KI-Tools nicht mehr verwenden, geben Sie bitte an, welches es ist, und begründen Sie dies.
11. Wie bewerten Sie den Nutzen der folgenden KI-Tools für Ihr Studium?
    i. Sehr gering
    ii. Gering
    iii. Neutral
    iv. Hoch
    v. Sehr hoch

Falls kein Tool benutzt wurde:

12. Bitte begründen Sie, warum Sie keine KI-Tools verwenden.

Perspektiven

13. Wie sicher sind Sie, dass Sie KI-Tools für das Psychologiestudium an der FHNW sinnvoll nutzen können?
    f. Überhaupt nicht sicher
    g. Nicht sicher
    h. Neutral
    i. Etwas sicher
    j. Sehr sicher
14. Bitte erläutern Sie, für was Sie KI-Tools im Psychologiestudium sinnvoll einsetzen könnten.
15. Inwieweit stimmen Sie diesem Satz zu: „Die Einbeziehung von KI-Tools in das Psychologiestudium an der FHNW ist sinnvoll.“
    f. Stimme überhaupt nicht zu
    g. Stimme nicht zu
    h. Neutral
    i. Stimme zu
    j. Stimme völlig zu
16. Welche Bedenken haben Sie bei der Nutzung von KI-Tools im Psychologiestudium an der FHNW?
17. Welche Vorteile erwarten Sie durch die Nutzung von KI-Tools im Psychologiestudium?

18. Welche Herausforderungen erwarten Sie durch die Nutzung von KI-Tools im Psychologiestudium?

Aufgaben und Präferenzen

19. Für welche studiumsbezogenen Aufgaben bevorzugen Sie die Unterstützung durch einen Menschen anstatt durch KI-Tools?
    i. Zusammenfassungen von wissenschaftlichen Arbeiten (z.B. Artikel, Fachbücher, usw.)
    ii. Sprachliche Übersetzung
    iii. Verstehen neuer Konzepte
    iv. Anwenden neuer Konzepte
    v. Vertiefung von Lerninhalten
    vi. Präsentationen
    vii. Vorbereitung auf Prüfungen
    viii. Sonstiges (bitte angeben)
20. In welchen Bereichen erwarten Sie positive bzw. negative Auswirkungen für das Psychologiestudium durch den Einsatz von KI-Tools?
    a. *Sehr negative Auswirkung*
    b. *Negative Auswirkung*
    c. *Weder negative noch positive Auswirkung*
    d. *Positive Auswirkung*
    e. *Sehr positive Auswirkung*
        i. Kritisches Denken
        ii. Problemlösung
        iii. Teamarbeit
        iv. Selbstwirksamkeit
        v. Leistung
        vi. Motivation
        vii. Engagement
        viii. Prüfungsangst
        ix. Plagiarismus

x. Faulheit

Berufliche Einfluss

21. Glauben Sie, dass das Wissen über den Einsatz von KI-Tools auch für Ihre (zukünftigen) beruflichen Tätigkeiten nützlich sein wird?
    f. Stimme überhaupt nicht zu
    g. Stimme nicht zu
    h. Neutral
    i. Stimme zu
    j. Stimme völlig zu
22. Bitte begründen Sie Ihre Antwort.

Trainingswünsch

23. Inwieweit stimmen Sie diesem Satz zu: „Ich fühle mich ausreichend geschult, um KI-Tools in meinem Psychologiestudium an der FHNW einzusetzen."
    i. stimme überhaupt nicht zu
    ii. stimme nicht zu
    iii. neutral
    iv. stimme zu
    v. stimme völlig zu
24. Bitte teilen Sie uns mit, welche spezifischen Informationen oder Schulungen Sie im Zusammenhang mit der Anwendung von KI-Tools wünschen.

Teilnahme an Interviews

Im Rahmen meiner Masterarbeit plane ich, mit ausgewählten Studierenden ein etwa 30-minütiges Interview durchzuführen, um die Erkenntnisse aus der Umfrage zu vertiefen und mehr über Ihre Erfahrungen mit Künstlicher Intelligenz (KI) zu erfahren. Ich würde mich sehr freuen, wenn Sie bereit wären, an diesem Interview teilzunehmen. Bitte teilen Sie mir Ihre E-Mail-Adresse direkt unten mit oder kontaktieren Sie mich unter nicole.lartey@students.fhnw.ch

Survey 3: MSc Students

Demografie

1. Bitte geben Sie Ihr Alter ein.
2. Bitte wählen Sie Ihr Geschlecht aus.
    i. Weiblich
    ii. Männlich
    iii. Divers
3. In welchem Studiengang sind Sie?
    i. Master AOP Vollzeit
    ii. Master AOP Teilzeit
    iii. Master WP Vollzeit
    iv. Master WP Teilzeit
4. In welchem Semester studieren Sie?

Erfahrung mit KI-Tools

5. Welche der folgenden KI-Tools haben Sie verwendet?

    ChatGPT, Consensus AI, Research Rabbit, SciSpace, Litmaps, DeepL Writer, Microsoft Bing, Google Bard Sonstiges, Keines
6. Gibt es ein anderes KI-Tool, das Sie verwendet haben?

Falls ein Tool benutzt wurde:

7. Wofür haben Sie die KI-Tools verwendet? *(je nach ausgewählten Tools)*
8. Wie oft verwenden Sie die KI-Tools? *(je nach ausgewählten Tools)*
    i. Nie
    ii. Einmal pro Tag
    iii. Mehrmals pro Tag
    iv. Einmal pro Woche
    v. Mehrmals pro Woche
    vi. Einmal pro Monat
    vii. Mehrmals pro Monat
9. Wenn Sie eines der oben genannten KI-Tools nicht mehr verwenden, geben Sie bitte an, welches es ist, und begründen Sie dies.

10. Wie bewerten Sie den Nutzen der folgenden KI-Tools für Ihr Studium? *(je nach ausgewählten Tools)*
    i. Sehr gering
    ii. Gering
    iii. Neutral
    iv. Hoch
    v. Sehr hoch

Falls ein Tool nie benutzt wurde:

11. Bitte begründen Sie, warum Sie keine KI-Tools verwenden.

Perspektiven

12. Wie sicher sind Sie, dass Sie KI-Tools für das Psychologiestudium an der FHNW sinnvoll nutzen können?
    k. Überhaupt nicht sicher
    l. Nicht sicher
    m. Neutral
    n. Etwas sicher
    o. Sehr sicher
13. Bitte erläutern Sie, für was Sie KI-Tools im Psychologiestudium sinnvoll einsetzen könnten.
14. Inwieweit stimmen Sie diesem Satz zu: „Die Einbeziehung von KI-Tools in das Psychologiestudium an der FHNW ist sinnvoll."
    i. Stimme überhaupt nicht zu
    ii. Stimme nicht zu
    iii. Neutral
    iv. Stimme zu
    v. Stimme völlig zu
15. Welche Bedenken haben Sie bei der Nutzung von KI-Tools im Psychologiestudium an der FHNW?
16. Welche Vorteile erwarten Sie durch die Nutzung von KI-Tools im Psychologiestudium?

17. Welche Herausforderungen erwarten Sie durch die Nutzung von KI-Tools im Psychologiestudium?

Aufgaben und Präferenzen

18. Für welche studiumsbezogenen Aufgaben bevorzugen Sie die Unterstützung durch einen Menschen anstatt durch KI-Tools?
    i. Zusammenfassungen von wissenschaftlichen Arbeiten (z.B. Artikel, Fachbücher, usw.)
    ii. Sprachliche Übersetzung
    iii. Verstehen neuer Konzepte
    iv. Anwenden neuer Konzepte
    v. Vertiefung von Lerninhalten
    vi. Präsentationen
    vii. Vorbereitung auf Prüfungen
    viii. Sonstiges (bitte angeben)
19. In welchen Bereichen erwarten Sie positive bzw. negative Auswirkungen für das Psychologiestudium durch den Einsatz von KI-Tools?
    a. *Sehr negative Auswirkung*
    b. *Negative Auswirkung*
    c. *Weder negative noch positive Auswirkung*
    d. *Positive Auswirkung*
    e. *Sehr positive Auswirkung*
        i. Kritisches Denken
        ii. Problemlösung
        iii. Teamarbeit
        iv. Selbstwirksamkeit
        v. Leistung
        vi. Motivation
        vii. Engagement
        viii. Prüfungsangst
        ix. Plagiarismus

x. Faulheit

Berufliche Einfluss

20. Glauben Sie, dass das Wissen über den Einsatz von KI-Tools auch für Ihre (zukünftigen) beruflichen Tätigkeiten nützlich sein wird?
    k. Stimme überhaupt nicht zu
    l. Stimme nicht zu
    m. Neutral
    n. Stimme zu
    o. Stimme völlig zu
21. Bitte begründen Sie Ihre Antwort.

Trainingswünsch

22. Inwieweit stimmen Sie diesem Satz zu: „Ich fühle mich ausreichend geschult, um KI-Tools in meinem Psychologiestudium an der FHNW einzusetzen."
    i. stimme überhaupt nicht zu
    ii. stimme nicht zu
    iii. neutral
    iv. stimme zu
    v. stimme völlig zu

23. Bitte teilen Sie uns mit, welche spezifischen Informationen oder Schulungen Sie im Zusammenhang mit der Anwendung von KI-Tools wünschen.

Teilnahme an Interviews

Im Rahmen meiner Masterarbeit plane ich, mit ausgewählten Studierenden ein etwa 30-minütiges Interview durchzuführen, um die Erkenntnisse aus der Umfrage zu vertiefen und mehr über Ihre Erfahrungen mit Künstlicher Intelligenz (KI) zu erfahren. Ich würde mich sehr freuen, wenn Sie bereit wären, an diesem Interview teilzunehmen. Bitte teilen Sie mir Ihre E-Mail-Adresse direkt unten mit oder kontaktieren Sie mich unter nicole.lartey@students.fhnw.ch

Survey 4: MAS/CAS Students

Demografie

1. Bitte geben Sie Ihr Alter ein.
2. Bitte wählen Sie Ihr Geschlecht aus.
    i. Weiblich
    ii. Männlich
    iii. Divers

Erfahrung mit KI-Tools

3. Welche der folgenden KI-Tools haben Sie verwendet?

    ChatGPT, Consensus AI, Research Rabbit, SciSpace, Litmaps, DeepL Writer, Microsoft Bing, Google Bard, Sonstiges, Keines

4. Gibt es ein anderes KI-Tool, das Sie verwendet haben?

Falls ein Tool benutzt wurde:

5. Wofür haben Sie die KI-Tools verwendet? *(je nach ausgewählten Tools)*
6. Wie oft verwenden Sie die KI-Tools? *(je nach ausgewählten Tools)*
    i. Nie
    ii. Einmal pro Tag
    iii. Mehrmals pro Tag
    iv. Einmal pro Woche
    v. Mehrmals pro Woche
    vi. Einmal pro Monat
    vii. Mehrmals pro Monat
7. Wenn Sie eines der oben genannten KI-Tools nicht mehr verwenden, geben Sie bitte an, welches es ist, und begründen Sie dies.
8. Wie bewerten Sie den Nutzen der folgenden KI-Tools für Ihre Weiterbildung? *(je nach ausgewählten Tools)*
    i. Sehr gering
    ii. Gering
    iii. Neutral
    iv. Hoch

v. Sehr hoch

Falls kein Tool benutzt wurde:

9. Bitte begründen Sie, warum Sie keine KI-Tools verwenden.

Perspektiven

10. Wie sicher sind Sie, dass Sie KI-Tools in der Weiterbildung an der FHNW sinnvoll nutzen können?
    i. Überhaupt nicht sicher
    ii. Nicht sicher
    iii. Neutral
    iv. Etwas sicher
    v. Sehr sicher
11. Bitte erläutern Sie, für was Sie KI-Tools in der Weiterbildung sinnvoll einsetzen könnten.
12. Inwieweit stimmen Sie diesem Satz zu: „Die Einbeziehung von KI-Tools in der Weiterbildung an der FHNW ist sinnvoll."
    i. Stimme überhaupt nicht zu
    ii. Stimme nicht zu
    iii. Neutral
    iv. Stimme zu
    v. Stimme völlig zu
13. Welche Bedenken haben Sie bei der Nutzung von KI-Tools in der Weiterbildung an der FHNW?
14. Welche Vorteile erwarten Sie durch die Nutzung von KI-Tools in der Weiterbildung?
15. Welche Herausforderungen erwarten Sie durch die Nutzung von KI-Tools in der Weiterbildung?

Aufgaben und Präferenzen

16. Für welche weiterbildungsbezogenen Aufgaben bevorzugen Sie die Unterstützung durch einen Menschen anstatt durch KI-Tools?
    a. Zusammenfassungen von wissenschaftlichen Arbeiten (z.B. Artikel, Fachbücher, usw.)
    b. Sprachliche Übersetzung

c. Verstehen neuer Konzepte
d. Anwenden neuer Konzepte
e. Vertiefung von Lerninhalten
f. Präsentationen
g. Vorbereitung auf Prüfungen
h. Sonstiges (bitte angeben)

17. In welchen Bereichen erwarten Sie positive bzw. negative Auswirkungen für die Weiterbildung durch den Einsatz von KI-Tools?
    i. *Sehr negative Auswirkung*
    ii. *Negative Auswirkung*
    iii. *Weder negative noch positive Auswirkung*
    iv. *Positive Auswirkung*
    v. *Sehr positive Auswirkung*

a. Kritisches Denken
b. Problemlösung
c. Teamarbeit
d. Selbstwirksamkeit
e. Leistung
f. Motivation
g. Engagement
h. Prüfungsangst
i. Plagiarismus
j. Faulheit

Beruflicher Einfluss

18. Glauben Sie, dass das Wissen über den Einsatz von KI-Tools auch für Ihre beruflichen Tätigkeiten nützlich sein wird?
    i. Stimme überhaupt nicht zu
    ii. Stimme nicht zu
    iii. Neutral
    iv. Stimme zu

v. Stimme völlig zu

19. Bitte begründen Sie Ihre Antwort.

Trainingswünsch

20. Inwieweit stimmen Sie diesem Satz zu: „Ich fühle mich ausreichend geschult, um KI-Tools in der Weiterbildung an der FHNW einzusetzen."
    i. Stimme überhaupt nicht zu
    ii. Stimme nicht zu
    iii. Neutral
    iv. Stimme zu
    v. Stimme völlig zu
21. Bitte teilen Sie uns mit, welche spezifischen Informationen oder Schulungen Sie im Zusammenhang mit der Anwendung von KI-Tools wünschen.

Teilnahme an Interviews

Im Rahmen meiner Masterarbeit plane ich, mit ausgewählten Studierenden ein etwa 30-minütiges Interview durchzuführen, um die Erkenntnisse aus der Umfrage zu vertiefen und mehr über Ihre Erfahrungen mit Künstlicher Intelligenz (KI) zu erfahren. Ich würde mich sehr freuen, wenn Sie bereit wären, an diesem Interview teilzunehmen. Bitte teilen Sie mir Ihre E-Mail-Adresse direkt unten mit oder kontaktieren Sie mich unter nicole.lartey@students.fhnw.ch

Survey 5: Lecturers

Demografie

1. Bitte geben Sie Ihr Alter ein.
2. Bitte wählen Sie Ihr Geschlecht aus.
    a. Weiblich
    b. Männlich
    c. Divers
3. In welchem Studiengang unterrichten Sie?
    a. Bachelor AOP
    b. Bachelor WP

c. Master AOP
d. Master WP
e. MAS
f. CAS

Erfahrungen

4. Welche der folgenden KI-Tools kennen Sie und welche haben Sie verwendet?
    a. Welche KI-Tools kennen Sie? *ChatGPT, Consensus AI, Research Rabbit, SciSpace, Litmaps, DeepL Write, Microsoft Bing, Google Bard, Sonstiges, Keines*
    b. Welche KI-Tools haben Sie schon verwendet? *ChatGPT, Consensus AI, Research Rabbit, SciSpace, Litmaps, DeepL Write, Microsoft Bing, Google Bard, Sonstiges, Keines*
5. Gibt es ein anderes KI-Tool, das Sie kennen/verwendet haben? *(je nach ausgewählten Tools)*
    a. Bekannt
    b. Verwendet

Falls ein Tool benutzt wurde:

6. Wofür haben Sie die KI-Tools verwendet? *(je nach ausgewählten Tools)*
7. Wie oft verwenden Sie die KI-Tools? *(je nach ausgewählten Tools)*
    i. Einmal pro Tag
    ii. Mehrmals pro Tag
    iii. Einmal pro Woche
    iv. Mehrmals pro Woche
    v. Einmal pro Monat
    vi. Mehrmals pro Monat
    vii. Einmal alle paar Monate
    viii. Nie
8. Wenn Sie eines der oben genannten KI-Tools nicht mehr verwenden, geben Sie bitte an, welches es ist, und begründen Sie dies.

Falls kein Tool benutzt wurde:

9. Bitte begründen Sie, warum Sie keine KI-Tools verwenden.

Perspektiven – Nutzen durch Studierenden

10. Wie sinnvoll erachten Sie es, dass Studierende KI für studiumsbezogene Aufgaben anwenden?
    i. Überhaupt nicht sinnvoll
    ii. Nicht sinnvoll
    iii. Neutral
    iv. Sinnvoll
    v. Sehr sinnvoll
11. In welchen studiumsbezogenen Aufgaben sehen Sie die Möglichkeit einer Unterstützung durch KI-Tools?
    a. Zusammenfassungen von wissenschaftlichen Arbeiten (z.B. Artikel, Fachbücher, usw.)
    b. Sprachliche Übersetzung
    c. Verstehen neuer Konzepte
    d. Anwenden neuer Konzepte
    e. Vertiefung von Lerninhalten
    f. Präsentationen
    g. Vorbereitung auf Prüfungen
    h. Forschung
    i. Fragen zum üben
    j. Sonstiges (bitte angeben)
12. Welche Bedenken haben Sie bei der Nutzung von KI-Tools im Psychologiestudium bzw. in der Weiterbildung an der FHNW?
13. Welche Vorteile erwarten Sie durch die Nutzung von KI-Tools im Psychologiestudium bzw. in der Weiterbildung an der FHNW?
14. In welchen Bereichen erwarten Sie positive bzw. negative Auswirkungen für das Psychologiestudium bzw. die Weiterbildung durch die Einbeziehung von KI-Tools?
    i. Sehr negative Auswirkung
    ii. Negative Auswirkung
    iii. Weder negative noch positive Auswirkung
    iv. Positive Auswirkung

v. Sehr positive Auswirkung

a. Kritisches Denken
b. Problemlösung
c. Teamarbeit
d. Selbstwirksamkeit
e. Leistung
f. Motivation
g. Engagement
h. Prüfungsangst
i. Plagiarismus
j. Faulheit

15. Welche ethischen Richtlinien sollten den Studierenden zur Verfügung gestellt werden, wenn sie KI-Tools für ihre Leistungsnachweise nutzen?
16. Wie relevant ist es für Studierende, KI-Kenntnisse zu erwerben, um in ihrer beruflichen Laufbahn erfolgreich zu sein?
    i. Überhaupt nicht relevant
    ii. Nicht relevant
    iii. Neutral
    iv. Etwas relevant
    v. Sehr relevant

Perspektiven – Dozierendenbezogene

17. Wie tragen KI-Tools dazu bei, Ihre Lehr- und Arbeitsaufgaben zu unterstützen? (beruflichen Anforderung)
18. Unterstützen KI-Tools Sie bei der Planung bzw. Gestaltung von Lehrveranstaltungen? (Planung & Gestaltung)
    i. Ja
    ii. Nein

Wenn Ja

19. Welche KI-Tools nutzen Sie bereits für die Gestaltung Ihrer Lehrveranstaltungen?
20. Wie nutzen Sie KI-Tools bereits für die Gestaltung Ihrer Lehrveranstaltungen?

Wenn Nein

21. Planen Sie in Zukunft KI-Tools für Gestaltung von Lehrveranstaltungen zu nutzen?
    i. Ja
    ii. Nein

Wenn Ja

22. Welche KI-Tools planen Sie in Zukunft für die Gestaltung von Lehrveranstaltungen zu nutzen?
23. Wie planen Sie in Zukunft KI-Tools für Gestaltung von Lehrveranstaltungen zu nutzen?

Weitere Perspektiven

24. Welche KI-bezogenen Kompetenzen sind Ihrer Meinung nach für die Aus- und Weiterbildung besonders wichtig?
25. Welche konkreten Informationen oder Schulungen wünschen Sie sich bezüglich der Integration von KI-Tools in das Psychologiestudium bzw. die Weiterbildung an der FHNW?
26. Wie schätzen Sie den Einfluss von KI-Tools auf die Lernergebnisse der Studierenden ein?
    i. Sehr negativer Einfluss
    ii. Negativer Einfluss
    iii. Weder negativer noch positiver Einfluss
    iv. Positiver Einfluss
    v. Sehr positiver Einfluss
27. Haben Sie weitere Anmerkungen zum Nutzen von KI-Tools im Psychologiestudium bzw. in der Weiterbildung an der FHNW?

Appendix B: Interview Guide

Einverständniserklärung

Forschungsstudie zum Thema «Die Integration von KI-Tools in das Psychologiestudium/ die Weiterbildung an der FHNW».

- Ich verstehe, dass ich unabhängig von meiner aktuellen Teilnahme frei zurücktreten oder die Beantwortung einer Frage ohne Konsequenzen verweigern kann.
- Ich verstehe, dass ich innerhalb einer Frist von 2 Wochen nach dem Interview die Zustimmung zur Verwendung meiner Daten widerrufen kann, in diesem Fall wird das Material sofort gelöscht.
- Ich verstehe den Zweck und die Art der Studie und meine Fragen wurden angemessen beantwortet.
- Ich bin damit einverstanden, dass mein Interview aufgezeichnet wird. Ich verstehe, dass diese für die Dauer der Studie aufbewahrt werden und die Teammitglieder Zugriff darauf haben, die dann nach Abschluss der Studie archiviert und anschliessend gelöscht werden, sobald die maximale Speicherdauer von 2 Jahren nach dem Interview abgelaufen ist.
- Ich verstehe, dass mein Interview transkribiert wird und stimme der Verwendung bestimmter Zitate im Studienbericht zu, sofern alle identifizierenden Informationen entfernt werden. Dieses Transkript wird dann gelöscht, sobald die maximale Speicherdauer von 2 Jahren nach dem Interview abgelaufen ist.
- Ich verstehe, dass alle Informationen, die ich für diese Studie zur Verfügung stelle, streng vertraulich behandelt werden und ich anonym bleiben werde. Dies geschieht durch Namensänderungen und die Verschleierung von Details, die meine Identität oder die Identität von Personen, über die ich spreche, preisgeben könnten.
- Ich verstehe, dass ich berechtigt bin, jederzeit während der Studie auf die von mir bereitgestellten Informationen zuzugreifen.
- Ich verstehe, dass es mir freisteht, mich an die Forschenden zu wenden, um weitere Klärungen und Informationen zu erhalten.
- Ich verstehe, dass meine Daten nicht an Datenbanken Dritter verkauft werden.

Unterschrift der Teilnehmenden *(Kann auch digital sein)*	Unterschrift der Interviewerin
Ort/Datum	Ort/Datum

Für weitere Informationen oder Hinweise auf Fehlverhalten bei der Befragung wenden Sie sich bitte an:
Dr. Stefan Michel
Hochschule für Angewandte Psychologie (APS)
Institut Mensch in komplexen Systemen (MikS)
Fachhochschule Nordwestschweiz (FHNW)
E-Mail: stefan.michel@fhnw.ch

Leitfaden

«Die Integration von KI-Tools in das Psychologiestudium/die Weiterbildung»

Zeitplan*: 02.2024 – 04.2024
Anzahl der Interviews:** 15
Dauer des Interviews: 30 Minuten

Datum: _____
Niveau des Studiums: _____
Alter der TN: _____
Geschlecht der TN: _____

*** Allgemein**
**** insgesamt mit allen Stufen**

Informationen zu diesem Interviewleitfaden:

Alle Texte eingerückt und farbig *blau* dienen der Klärung für die Interviewerin.

EINLEITUNG

Der Zweck dieses Abschnitts ist es, eine Beziehung zu den TN aufzubauen und ihr den Einstieg in den Interviewprozess zu erleichtern.

Nochmals vielen Dank für Ihre Bereitschaft, an dieser Studie teilzunehmen. Mein Name ist Nicole Lartey und ich schreibe meine Masterarbeit zum Thema «Die Integration von KI-Tools in das Psychologiestudium/die Weiterbildung an der FHNW».

Könnten Sie sich bitte kurz vorstellen?

Vielen Dank dafür. Nur ein paar Dinge, die wir erwähnen sollten, bevor wir beginnen. Dieses Gespräch wird voraussichtlich ca. 30 Minuten dauern und wir werden verschiedene Fragen

durchgehen. Es steht Ihnen frei, sich so auszudrücken, wie Sie sich am wohlsten fühlst, und ich bin hier, um von Ihnen zu lernen. Es gibt keine richtigen oder falschen Antworten auf die Fragen und es wird keine Bewertung vorgenommen. Mir ist es wichtig, dass Sie Ihre Erkenntnisse teilen. Ihre Meinungen und Erfahrungen sind für meine Masterarbeit sehr wichtig.

Wie in der Einverständniserklärung erwähnt, wird dieses Interview aufgezeichnet, daher können Sie, wenn Sie möchten, Ihre Kamera ausschalten, damit nur Ihre Stimme gehört wird. Ihre Daten werden jedoch anonym behandelt und alle Vorgänge sind vertraulich. Sind Sie mit den Punkten, die auf diesem Blatt aufgeführt sind, immer noch einverstanden?

Haben Sie Fragen, bevor es losgeht? Fühlen Sie sich frei, Fragen zu stellen, die sich während des Gesprächs ergeben.

Ich beginne nun mit der Audioaufnahme.

ANLAUF

Diese allgemeine Fragerunde hilft der TN, sich auf das Gespräch vorzubereiten, damit sie sich nicht überfallen fühlen. Es werden erste Einblicke in die Meinungen der TN zu KI-Tools aufgedeckt.

- Was denken Sie aktuell über KI-Tools?
- Wie gut kennen Sie deren Vor- und Nachteile?
- Welche Aspekte von KI finden Sie besonders interessante? warum?
- Welche Aspekte von KI finden Sie besonders herausfordernd? warum?

HAUPTSEKTION

Erfahrungen während der Semester

In diesem Abschnitt sollen wir einen Einblick in die Erfahrungen erhalten, die die TN während des Semesters gesammelt haben und wie sich die Werkstatt bzw. den Kurs darauf ausgewirkt hat.

- Wie hat sich Ihre Einstellung gegenüber KI-Tools im Laufe des Semesters verändert?
- Können Sie den Einsatz von KI-Tools für Ihre Werkstattarbeit/MAS Thesis/Leistungsnachweis im CAS beschreiben?
- Vor welchen Herausforderungen standen Sie beim Erlernen des Umgangs mit diesen Tools?
- Welche Erwartungen hatten Sie? Wie wurden diese erfüllt?
- Wie haben Sie diese KI-Tools während des Semesters noch für andere Leistungsnachweise benutzt?

Vergleich quantitativer Datenpunkte

In diesem Abschnitt werden bestimmte Datenergebnisse aus dem Survey in Form von Grafiken dargestellt, um die Meinungen der Teilnehmenden darüber zu untersuchen.

Zu zeigende Grafiken:

- *Wie sicher sind Sie, dass Sie KI-Tools für das Psychologiestudium/die Weiterbildung an der FHNW sinnvoll nutzen können?*
- *Inwieweit stimmen Sie diesem Satz zu: "Die Einbeziehung von KI-Tools in das Psychologiestudium/die Weiterbildung an der FHNW ist sinnvoll."*
- *Für welche studienbezogenen Aufgaben bevorzugen Sie die Unterstützung durch einen Menschen anstatt durch KI-Tools?*
- *In welchen Bereichen erwarten Sie positive bzw. negative Auswirkungen für das Psychologiestudium/die Weiterbildung durch den Einsatz von KI-Tools?*

Wahrgenommene Auswirkungen

In diesem Abschnitt sollen Erkenntnisse darüber gewonnen werden, wie sich die TN auf den Rest ihres Masterstudiums/ihrer Weiterbildung an der FHNW auswirken werden.

- Wie würden Sie Ihre derzeitige Kompetenz in Bezug auf die Verwendung dieser Tools für Ihre studienbezogenen Leistungsnachweisen/Ihre Weiterbildung beschreiben? *(Auf einer Skala von 1 – ganz schlecht bis 5 – ganz gut, wie würden Sie das einschätzen/beurteilen?)*
- Wie werden Sie Ihrer Meinung nach während Ihres Studiums/Ihrer Weiterbildung von der Integration von KI-Tools profitieren?
- Welche Bedenken gibt es bei dieser Integration?
- Wie sehen Sie die zukünftige Nutzung dieser KI-Tools?
- Wie würden Sie auf den folgenden Sätzen reagieren:

> *«Der Einsatz von KI in das Psychologiestudium/die Weiterbildung ist nicht sinnvoll, weil Studierenden dadurch nicht lernen. Sie sollten das Wissen lieber selber erarbeiten, anstatt sich auf die Angaben eines Roboters zu verlassen.»*
>
> *«Es wird eine Herausforderung, mit den KI-Tools mitzuhalten. Ausserdem könnten sich Studierenden gezwungen fühlen, KI-Tools zu verwenden, und es*

würde meiner Meinung nach nicht richtig sein, jemanden zur Nutzung zu zwingen, selbst wenn offiziell erklärt würde, dass es nicht erforderlich ist. »

Relevanz für die Psychologie

In diesem Abschnitt sollen Erkenntnisse über die wahrgenommene Relevanz von KI-Tools für das Studium/die Weiterbildung und den Beruf des:r Psycholog:innen gewonnen werden.

- Wie beurteilen Sie die Relevanz dieser KI-Tools für Ihr Studienfach? Warum?
- Wie stehen Sie einer Integration von KI-Tools in Ihre beruflichen Anforderungen gegenüber? *(Welche Auswirkungen würden sich Ihrer Meinung nach ergeben)*
- Wie würden Sie auf den folgenden Sätzen reagieren:

  «Ich denke nicht, dass künstliche Intelligenz auf psychologischer Ebene aktuell ein Mehrwert darstellen könnte. Ich denke, dass die Psychologie eine solche komplexe Materie ist, die der Mensch beherrschen sollte und nicht eine künstliche Intelligenz.»

Vorschläge für die Zukunft

In diesem Abschnitt sollen Erkenntnisse darüber gewonnen werden, welche weiteren Bedürfnisse die TN in Bezug auf die Integration von KI-Tools in ihr Studium/ihre Weiterbildung haben.

- Welche weitere Unterstützung benötigen Sie für die Integration dieser KI-Tools in Ihr Studium/ Ihre Weiterbildung?
- Welche neuen Fähigkeiten und Kenntnisse sollten Studierende entwickeln, um KI effektiv in ihrem Studium/ihrer Weiterbildung einzusetzen?
- Welche Lehrformate wären aus Ihrer Sicht dazu geeignet?
- Welche Entwicklungen im Bereich KI könnten in Zukunft das Psychologiestudium/die Weiterbildung in Psychologie beeinflussen?
- *Wie würden Sie auf dem folgenden Satz reagieren:*

  «Die Bedienung und Einsetzung von KI-Tools wird kommen und sicher in den nächsten Jahren noch verfeinert. Es ist sinnvoll, ob man dafür oder dagegen ist, nun ausgeschlossen, dass man damit umgehen kann. Es kann im späteren Berufsleben Dinge übernehmen»

SCHLIESSEN

- Welche Fragen beschäftigen Sie noch in Bezug auf die Integration von KI-Tools?
- Gibt es etwas, das Sie gerne sagen würden, wozu Sie die Gelegenheit nicht hatten?

Wir sind jetzt am Ende dieses Interviews angekommen. Was sind Ihre letzten Eindrücke? Gibt es noch weitere Fragen von Ihrer Seite?
Vielen Dank für Ihre Teilnahme und Ihre Offenheit. Dies war ein sehr interessantes und informatives Gespräch. Ich werde nun die Aufzeichnung beenden. Sie können sich gerne an uns wenden, wenn Sie noch Fragen oder Bedenken haben. Ich danke Ihnen noch einmal für Ihre Zeit und wünsche Ihnen einen schönen Rest des Tages.