Determinants of Continuous Use Intention: An Empirical Study of ChatGPT among Students in German Higher Education

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Abstract

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Title: Determinants of Continuous Use Intention: An Empirical Study of ChatGPT among Students in German Higher Education

Keywords: ChatGPT, Technology Continuance, Higher Education, AI Literacy, Habit, Technology Acceptance

The rapid integration of generative AI like ChatGPT into German higher education has outpaced empirical understanding of its long-term use. Beyond initial adoption, a critical gap exists regarding factors driving students to sustainably embed these tools into academic workflows. This thesis addresses this gap by identifying and empirically analyzing the key determinants of students' Continuous Use Intention (CUI) of ChatGPT for academic purposes within this national context.

A quantitative, cross-sectional survey was conducted, and a series of linear regression analyses were performed to test an integrated model combining constructs from technology acceptance theories with AI-specific factors. The results revealed a hierarchy of factors predicting CUI.

Habit emerged as the most powerful determinant of CUI, followed by Perceived Usefulness and AI Literacy, all showing significant positive effects. Contrary to established models, Satisfaction and Trust in AI did not have a significant direct influence in the final model. However, Perceived Accuracy was a strong predictor of both, establishing it as a foundational prerequisite.

This research concludes that sustained use of ChatGPT by German students is primarily a function of routinized behavior, perceived value, and user competence. Findings suggest that traditional drivers like Satisfaction and Trust act as indirect, foundational "gateway" conditions rather than direct drivers in a mature usage context.

Resumo

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Título: Determinantes da Intenção de Uso Contínuo: Um Estudo Empírico do ChatGPT entre Estudantes no Ensino Superior Alemão

Palavras-chave: ChatGPT, Continuidade Tecnológica, Ensino Superior, Literacia em IA, Hábito, Aceitação Tecnológica

A rápida integração da inteligência artificial generativa, como o ChatGPT, no ensino superior alemão ultrapassou a compreensão empírica do uso. Além da adoção inicial, existe uma lacuna crítica na compreensão dos fatores que levam os estudantes a incorporar de forma sustentável essas ferramentas nos fluxos académicos. Esta dissertação aborda essa lacuna, identificando e analisando empiricamente os principais determinantes da Intenção de Uso Contínuo (IUC) do ChatGPT para fins académicos.

Foi realizada uma pesquisa quantitativa transversal, seguida de análises de regressão para testar um modelo integrado que combina conceitos das teorias de aceitação da tecnologia com fatores específicos da IA. Os resultados revelaram uma hierarquia de preditores da IUC. O hábito surgiu como o determinante mais forte, seguido pela utilidade percebida e pelo conhecimento sobre IA, todos com efeitos positivos significativos. Ao contrário dos modelos estabelecidos, a satisfação e a confiança na IA não tiveram uma influência direta significativa no modelo final. No entanto, a precisão percebida provou ser um indicador robusto de ambos, estabelecendo-se como requisito fundamental.

Conclui-se que o uso contínuo do ChatGPT por estudantes alemães é principalmente resultado da rotina, do valor percebido e da competência do utilizador. As descobertas sugerem que fatores tradicionais, como satisfação e confiança, funcionam mais como condições básicas ou "portas de entrada" indiretas do que como impulsionadores diretos em um contexto maduro.

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List of Abbreviations

ACC - Perceived Accuracy

AI - Artificial Intelligence

AIL - AI Literacy

CUI - Continuous Use Intention

ECM - Expectation-Confirmation Model

HAB - Habit

LLM - Large Language Models

PEOU - Perceived Ease of Use

PU - Perceived Usefulness

SAT - Satisfaction

TAM - Technology Acceptance Model

TRU - Trust in AI

UTAUT - Unified Theory of Acceptance and Use of Technology

VIF - Variance Inflation Factor

1 Introduction

The emergence of powerful generative Artificial Intelligence (AI), exemplified by Large Language Models (LLMs) such as OpenAI's ChatGPT, represents a significant technological shift with far-reaching societal implications (Gomes et al., 2023). These freely accessible tools, capable of generating human-like text, summarizing complex information, and performing diverse language-based tasks, have rapidly permeated various aspects of daily life, including higher education (Labadze et al., 2023; Nazaretsky et al., 2022).

The sudden availability of such powerful AI has begun to fundamentally alter the academic landscape, presenting a new class of tools that students are integrating into their daily workflows. As these technologies transition from novelties to potentially integral parts of the academic toolkit, a more pressing question emerges beyond initial adoption rates: what determines whether these tools are merely tested or become truly embedded in student practices? Understanding the dynamics of this sustained integration is therefore critical for educators, institutions, policymakers and developers alike (Shahzad et al., 2024; Sharma et al., 2022).

The rapid proliferation and significant initial uptake of generative AI tools like ChatGPT within German higher education are well documented, with a substantial proportion of students already engaging with these technologies for various academic tasks (Von Garrel & Mayer, 2023). However, beyond this initial wave of adoption, a critical problem emerges: there is a significant lack of empirically grounded understanding regarding the specific factors that drive or facilitate the continued and sustained use of ChatGPT by students specifically within the German higher education context. While existing research often focuses on initial acceptance or provides insights from different national settings, the unique interplay of cognitive, behavioral, AI-specific, and contextual factors influencing long-term integration of such powerful AI tools into the academic workflows of German students remains insufficiently explored (Abbas et al., 2024; Kleine et al., 2025; Schei et al., 2024; Von Garrel & Mayer, 2023). This knowledge gap hinders the ability of educational institutions, policymakers, and educators in Germany to develop targeted strategies and effective support mechanisms that ensure these technologies are leveraged productively and sustainably to enhance student learning and academic success (Jo, 2024; Labadze et al., 2023).

This master’s thesis focuses specifically on the student perspective within this evolving landscape. The primary objective of this study is to identify and empirically analyze the factors that facilitate the sustained use of ChatGPT for academic purposes by students within the

German higher education system, moving beyond initial adoption to understand sustained engagement.

Technology acceptance research distinguishes between initial *adoption* (the decision to first try a technology) and *continued use* (its sustained integration into practices), recognizing that the factors driving these stages may differ (Bhattacherjee, 2001; Venkatesh et al., 2003). Given the widespread initial exposure to ChatGPT, this study deliberately concentrates on the latter stage (*continued use*) to investigate the determinants of sustained integration and perceived value post-adoption. Consequently, the central dependent variable of this study is the user's *Continuous Use Intention,* which represents their subjective likelihood of continuing to use ChatGPT for their academic tasks in the future (Chang et al., 2015; Limayem et al., 2007; Lu & Hsiao, 2007). This focus aims to provide deeper insights into how this technology is becoming embedded (or not) in the academic workflows and learning habits of students specifically within the German higher education context.

There are four key reasons for investigating these continued use factors specifically within the German context. Firstly, the sheer pervasiveness of ChatGPT necessitates empirical evidence that moves beyond anecdote to understand sustained engagement patterns (Jo, 2023). Secondly, because technology adoption is highly context-dependent, a specific investigation is needed to understand how Germany's unique educational culture shapes the integration of AI tools compared to other regions (Abdaljaleel et al., 2024; Dinev & Hart, 2006). Thirdly, identifying the drivers of continued use yields actionable insights that enable educators to refine pedagogical strategies, institutions to develop informed policies, and developers to tailor their tools more effectively for educational needs (Alshammari et al., 2024). Finally, the novelty and rapid evolution of generative AI demand contemporary empirical validation. While foundational theories of technology acceptance provide an important theoretical lens, their applicability to a disruptive tool like ChatGPT cannot be taken for granted and requires rigorous testing in the current environment (Cao & Peng, 2024).

This thesis is organized as follows. Chapter 2 establishes the theoretical foundation by reviewing the literature on AI in academia and technology continuance models, culminating in the identification of the research gap. Building on this, Chapter 3 formulates the study’s core hypotheses. The quantitative research methodology is then detailed in Chapter 4, followed by the presentation of the empirical results in Chapter 5. These findings are interpreted and discussed in relation to the theoretical framework in Chapter 6. Finally, Chapter 7 concludes

the thesis by summarizing the key findings, acknowledging the study's limitations, and offering implications for future research and practice.

2 Theoretical Foundations and Empirical Context

2.1 ChatGPT and the AI Landscape in Higher Education

Artificial intelligence (AI) has been a concept since the mid-20th century, but its capabilities have advanced in waves. The term “AI” dates back to the 1950s, and early efforts focused on symbolic reasoning and simple conversation programs (e.g. the ELIZA chatbot in 1966) (Zawacki-Richter et al., 2019). Periodic breakthroughs captured public attention – for example, the 1997 defeat of world chess champion Garry Kasparov by IBM's Deep Blue, which marks a milestone in AI history. Another landmark came in 2016 when Google DeepMind’s AlphaGo system beat a champion Go player, a feat many experts had thought a decade away (Hern, 2016).

By the late 2010s, improvements in computing power, algorithms, and data availability began to accelerate AI progress (Von Garrel & Mayer, 2023). A pivotal development was the 2017 introduction of the ‘*transformer'* architecture, which enabled a new class of AI: Large Language Models. LLMs are trained on vast text datasets to understand and generate sophisticated, human-like language, setting the stage for the mainstream emergence of generative AI (Dempere et al., 2023; Vaswani et al., 2017; Zhou et al., 2024). This evolution set the stage for ChatGPT’s emergence in 2022. After decades of incremental progress, AI had matured to the point of producing convincing, contextually relevant language (Von Garrel & Mayer, 2023).

This technological shift was crystallized for the public with the release of OpenAI's ChatGPT in November 2022. As a conversational AI fine-tuned for dialogue, its simple interface made advanced capabilities accessible to a mass audience without requiring technical expertise. Within five days of launch it had over a million users, and in two months it reached an estimated 100 million monthly users. This makes ChatGPT the fastest-growing consumer application in history. The system’s ability to generate articles, essays, code, and answers on virtually any topic sparked widespread public fascination. OpenAI, a research lab backed by Microsoft, offered ChatGPT for free initially, catalyzing its rapid adoption. By bringing innovative AI to a mass audience, ChatGPT’s 2022 debut is often cited as a breakthrough moment when AI entered mainstream use (Gomes et al., 2023; Hu, 2023; Singh, 2025).

Education was immediately confronted with ChatGPT’s capabilities. Higher education institutions, educators, and particularly students are confronted with a powerful tool capable of assisting with, or potentially circumventing, a wide range of academic tasks, from

brainstorming and summarizing to drafting text and even generating code (Alessandri-Bonetti et al., 2024; Bond et al., 2024; Laato et al., 2023). While the potential applications in supporting learning and research are numerous, significant questions regarding appropriate use, academic integrity, and the reliability of AI-generated information immediately surfaced (Dempere et al., 2023; Von Garrel & Mayer, 2023). This initial wave of reactions treated ChatGPT as a threat to be managed or blocked. However, many saw such AI as a tool that could be harnessed to enhance learning if used responsibly. The disruptive entry of ChatGPT thus sparked a worldwide conversation about how education should evolve in the age of AI, underscoring the need for new skills (like prompt design and AI Literacy) and ethical standards for AI use in scholarship (Abdaljaleel et al., 2024; Hughes, 2023; Lukpat, 2023).

This global trend has been particularly pronounced within German higher education. Student adoption of AI tools, for instance, surged from 63% in 2023 to 91.6% by early 2025, with half of those students specifically citing ChatGPT. This trend reflects not only broader adoption but also deeper integration, as the proportion of "very frequent" users nearly tripled to over 26% while the share of non-users sank from 37% to just 8.4%. Students in Germany employ these tools for a wide array of academic activities, most commonly for research and information comprehension (68%), summarizing texts (40%), assistance with presentations and proofreading (33%) and language translation (35%) (Bitkom e.V., 2024; Von Garrel & Mayer, 2023; von Garrel & Mayer, 2025).

These reported uses in Germany mirror common applications identified internationally, where empirical studies confirm students leverage ChatGPT and similar LLMs for a diverse spectrum of academic tasks. Common applications reported internationally and within Germany include:

- Information Gathering and Processing: Summarizing lengthy texts, simplifying complex information, finding research articles, and enhancing general knowledge (Ravšelj et al., 2025; Sublime & Renna, 2024).
- Idea Generation and Planning: Brainstorming topics, formulating research questions, and planning or outlining assignments (Ravšelj et al., 2025; Sublime & Renna, 2024).
- Writing Assistance: Drafting text, structuring arguments, editing and proofreading (e.g., fixing grammar, improving clarity), and providing general writing support across various formats like essays and reports (Budhiraja et al., 2024; Imran & Almusharraf, 2023; Kim et al., 2024; Schei et al., 2024).

- Learning and Understanding: Explaining complex concepts, providing examples, engaging in concept tutoring, solving doubts, and generating practice questions (Budhiraja et al., 2024; Labadze et al., 2023; Schei et al., 2024).
- Discipline-Specific Tasks: Notably, coding assistance (generation, debugging) in computer science and support for mathematical problems in engineering (Bernabei et al., 2023; Budhiraja et al., 2024; Labadze et al., 2023).

Usage frequency and intensity, however, vary. Brainstorming, summarizing, and writing assistance appear to be frequent uses globally (Ravšelj et al., 2025). German data confirms disciplinary differences, with computer science students reporting the highest regular usage (61% monthly to daily), while around 25% of students in fields like social sciences use AI regularly for writing tasks. Factors like high academic workload and time pressure have also been linked to more frequent use (Budde, Friedrich, et al., 2024; Budde, Tobor, et al., 2024; Schei et al., 2024).

By the 2023/24 academic year, AI use was reported across virtually all subjects in Germany, consistent with findings from broader multinational studies which also highlight widespread adoption and generally positive attitudes towards ChatGPT in higher education globally (Abdaljaleel et al., 2024; Budde, Tobor, et al., 2024). This high level of initial exposure underscores the importance of understanding the factors that drive students continued use within their academic routines. This requires moving beyond the initial adoption and technical capabilities to examine the factors influencing sustained interaction and use.

2.2 Theoretical Frameworks for Technology Use and Continuance

To understand the factors driving the sustained use of ChatGPT among German students, this thesis is grounded in established theories from information systems (IS) research on technology acceptance and continuance. While models of initial adoption offer a starting point, a deeper understanding of ongoing engagement requires examining post-adoption factors such as user experience, evolving perceptions, and behavioral patterns. Consequently, this study's central dependent variable is *Continuous Use Intention (CUI)*. Defined by Limayem et al. (2007) as "an individual's subjective probability that he or she will continue to use a specific information system in the future," CUI serves as the most direct proxy for sustained behavior and is the key phenomenon this thesis aims to explain.

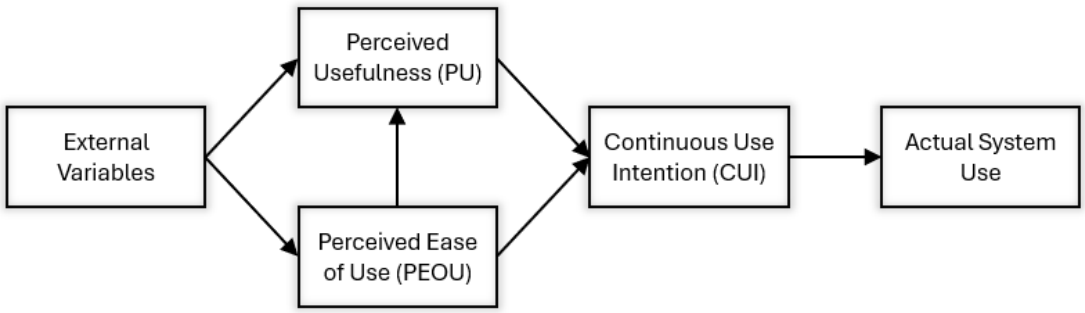
2.2.1 Foundational Models: TAM and UTAUT

Foundational work in technology acceptance is rooted in the Technology Acceptance Model (TAM) and the later Unified Theory of Acceptance and Use of Technology (UTAUT) (Davis, 1989; Venkatesh et al., 2003).

TAM posits that the behavioral intention to use a technology is primarily driven by its Perceived Usefulness (PU) – its ability to enhance performance – and its Perceived Ease of Use (PEOU) – the degree to which using the system is perceived as effortless (Davis, 1989).

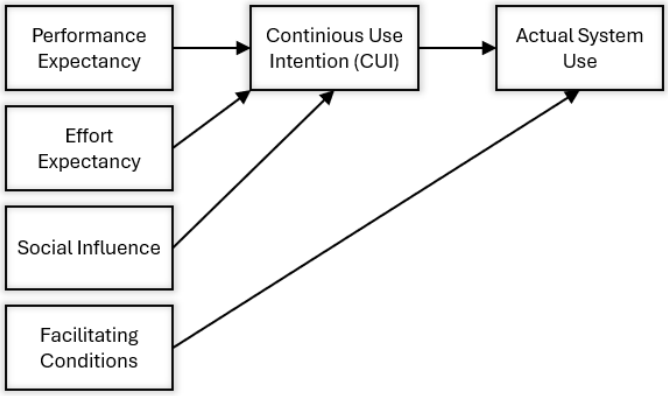
Figure 1

Technology Acceptance Model Framework



UTAUT expanded on this by integrating TAM and other models, proposing four key determinants of usage intention and behavior: Performance Expectancy (similar to PU), Effort Expectancy (similar to PEOU), Social Influence (which captures an individual's perception of social pressure from important others to utilize the system), and Facilitating Conditions (which refers to a user's belief that adequate organizational and technical infrastructure is in place to enable its use). While these constructs remain relevant – a student is unlikely to use ChatGPT if it is not useful or is difficult to operate – these models were primarily designed to predict a user's initial *decision to adopt* a technology, rather than the long-term, post-adoption behavior that this thesis seeks to explain (Ashrafi et al., 2022; Venkatesh et al., 2003).

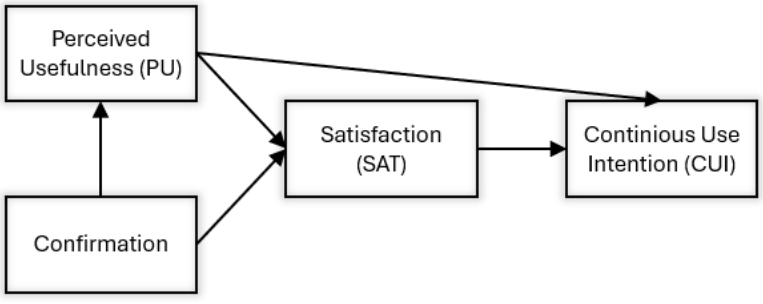
Figure 2
Unified Theory of Acceptance and Use of Technology Framework



2.2.2 Post-Adoption Experience: Expectation-Confirmation Model (ECM)

A central theory specifically addressing IS *continuance* is the Expectation-Confirmation Model (ECM), adapted from consumer behavior theory. ECM posits that continuance intention is primarily determined by Satisfaction with prior use and perceived Usefulness (post-adoption). Satisfaction, in turn, is influenced by the Confirmation (or disconfirmation) of expectations – the extent to which the user's experience with the technology matches their pre-use expectations. If ChatGPT's performance meets or exceeds a student's initial expectations (e.g., regarding its ability to explain concepts or draft text), their expectations are confirmed, leading to higher Satisfaction and a greater likelihood of continued use (Alshammari et al., 2024; Bhattacherjee, 2001). ECM highlights the critical role of user experience and Satisfaction, shifting the focus from pre-adoption beliefs to post-adoption evaluation.

Figure 3
Expectation-Confirmation Model Framework



2.2.3 The Power of Routine: Habit

Beyond cognitive evaluations of usefulness and Satisfaction, long-term technology continuance research highlights the powerful role of Habit (Limayem et al., 2007; Verplanken & Aarts, 1999). As a construct within the UTAUT2 model, Habit (in the context of information systems)

is defined as the extent to which individuals automatically use a technology due to learned patterns from frequent, repeated behavior in stable contexts. As students regularly turn to ChatGPT for specific tasks like summarizing articles or checking grammar, this usage can become a default, automatic action that requires less conscious deliberation (Biloš & Budimir, 2024; Limayem et al., 2007; Venkatesh et al., 2012).

This process suggests a specific dynamic: high Perceived Usefulness (TAM/UTAUT) and Satisfaction (ECM) encourage the initial, repeated use of the tool. Over time, this repeated behavior solidifies into a habit, which can then become a more dominant driver of continued use than momentary Satisfaction or usefulness. Habit is therefore a powerful predictor of frequent, ingrained engagement, particularly for the routine academic tasks for which students often leverage ChatGPT (Himang et al., 2023; Hsiao & Chen, 2016; Limayem et al., 2007; Venkatesh et al., 2012).

2.2.4 AI-Specific Factors

Finally, the unique nature of generative AI necessitates considering factors specific to human-AI interaction. Unlike traditional software, the output of which is predictable, LLMs generate novel content, making user perceptions of that output critical (Dwivedi et al., 2023; Grimes et al., 2023).

Perceived Accuracy: Given that LLMs can "hallucinate" or generate plausible but incorrect information, a user's subjective assessment of the output's correctness and factual reliability is crucial (Kim et al., 2024; Mollick & Mollick, 2022; Schei et al., 2024). Accuracy serves as a foundational component of the user experience. If the information provided by ChatGPT is perceived as inaccurate, it directly and negatively impacts Perceived Usefulness, as the tool fails to perform its core task effectively. This failure to meet performance expectations leads to a negative confirmation of expectations and, consequently, lower Satisfaction, as explained by the ECM framework (Thong et al., 2006; Venkatesh & Davis, 2000; Von Garrel & Mayer, 2023).

Trust in AI: This multifaceted construct includes beliefs about the AI's competence (ability to perform tasks), benevolence (intentions towards the user, including data privacy), and integrity (reliability, lack of bias) (Jo, 2023; Pan et al., 2024). For students to rely on an AI for academic tasks, a baseline of trust is fundamental. Perceived Accuracy is a primary antecedent of Trust; a tool that is consistently inaccurate cannot be perceived as competent or reliable, thereby eroding user trust. In the EU/German context, concerns about data handling and algorithmic

transparency also fall under the umbrella of Trust, influencing a student's willingness to engage with the system for sensitive academic work (Cao & Peng, 2024; Jo, 2023; Kim et al., 2024).

2.2.5 Synthesis of Theoretical Perspectives

A comprehensive understanding of German students' Continuous Use Intention of ChatGPT emerges not from a single theory, but from the synergy of diverse perspectives. Initial utility and ease of use (TAM/UTAUT) may trigger adoption, but sustained engagement is more likely driven by ongoing Satisfaction derived from confirmed, positive experiences (ECM), and increasingly solidified by the formation of usage habits (UTAUT2/Habit theory). Crucially, overlaying this entire dynamic are the students' perceptions of the AI's accuracy, their trust in its operations and outputs, and the overall quality of their interaction with it (AI-Specific Factors). These AI-centric perceptions can act as critical enablers or significant barriers, fundamentally influencing the efficacy of other established drivers.

Table 1
Models and Key Constructs for Continuous Use Intention

Model	**Key Constructs**
Technology Acceptance Model (TAM)	Perceived Usefulness (PU), Perceived Ease of Use (PEOU)
Unified Theory of Acceptance and Use of Technology (UTAUT)	Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions
Expectation-Confirmation Model (ECM)	Satisfaction, Perceived Usefulness, Confirmation
Continuance Models (UTAUT2)	Habit
AI-Specific Factors	Perceived Accuracy, Trust in AI

2.3 Empirical Studies on Student Use of AI/ChatGPT

Building upon the theoretical frameworks, this section reviews empirical findings from recent studies investigating how students engage with AI tools, particularly ChatGPT, in higher education. The focus shifts from theoretical potential to observed realities, examining empirically identified factors influencing sustained engagement and the challenges encountered. This review aims to assess the extent to which empirical findings align with, extend, or challenge theoretical propositions, paying particular attention to the context of German higher education where available.

2.3.1 Factors Influencing Sustained Use: Empirical Evidence

Empirical research on ChatGPT continuance provides strong validation for the foundational cognitive constructs discussed in Section 2.2.

Cognitive Factors (Usefulness, Ease of Use, Satisfaction): Consistent with the Technology Acceptance Model (TAM) and Expectation-Confirmation Model (ECM), Perceived Usefulness (or Performance Expectancy) consistently emerges as a primary driver of sustained use. Studies repeatedly find that when students perceive ChatGPT as valuable for improving their academic performance and facilitating learning, their intention to continue using it and their intensity of use increases significantly (Jo, 2023; Kleine et al., 2025; Schei et al., 2024; Yu et al., 2024; Zhou & Zhang, 2024). Likewise, Satisfaction with prior use is a key determinant, confirming the propositions of ECM. Students who have a positive experience, often because the tool met or exceeded their performance expectations, are far more likely to form long-term usage intentions (Duong, 2024; Ifinedo, 2018; Pasupuleti & Thiyyagura, 2024; Yu et al., 2024; Zhou & Zhang, 2024). While Perceived Ease of Use also contributes to positive perceptions, its direct effect on continuance is often weaker or mediated by PU, suggesting that for ongoing use, *what* the tool does is more important than how effortless it is to operate (Alshammari et al., 2024; Kleine et al., 2025; Yu et al., 2024).

Behavioral Factors (Habit): Supporting propositions from UTAUT2, empirical evidence reveals that Habit can become one of the most powerful drivers of continued ChatGPT use. In a study applying the UTAUT2 model to university students, Habit was the single most influential predictor of usage intention, with an impact even greater than that of Perceived Usefulness (Strzelecki, 2024). This key finding underscores a critical dynamic: as the use of ChatGPT for routine academic tasks becomes frequent, the behavior can shift from a conscious choice to an automatic one, creating a powerful force for sustained engagement that is less dependent on constant cognitive re-evaluation (Bissessar, 2023; Schei et al., 2024).

AI-Specific Factors (Accuracy, Trust): Trust in AI has emerged as a pivotal factor, referring to a student's confidence in ChatGPT's reliability and integrity. This is because the variable quality of AI-generated output introduces elements of risk and uncertainty. Research has quantitatively shown a strong, direct link between higher user trust and greater intention to continue using ChatGPT. Crucially, this trust is not built in a vacuum. Studies demonstrate that Perceived Accuracy is a key antecedent; when ChatGPT provides high-quality, correct information, it enhances both Perceived Usefulness and, critically, user trust (Mun & Hwang, 2025; Shahzad et al., 2024). This body of evidence confirms that for students to continue relying on ChatGPT

for academic work, they must first trust it, and that Trust is fundamentally grounded in their perception of its accuracy (Jo, 2023).

2.3.2 Challenges and Concerns in Academic Use

Beyond identifying facilitating factors, empirical studies and academic discourse highlight significant challenges associated with student use of ChatGPT:

Accuracy and Reliability: A primary concern is the potential for LLMs to generate inaccurate, biased, or fabricated information ("hallucinations"). This directly impacts the trustworthiness of the tool for academic research and learning, potentially misleading students if outputs are not critically evaluated (Bettayeb et al., 2024; Dempere et al., 2023; Labadze et al., 2023). German students, for instance, report awareness of this issue and the need to double-check information (Hoffmann, 2024).

AI Literacy (Prompt Skills): To get good results from ChatGPT, users benefit from skill in crafting prompts and using the system effectively (Kim et al., 2024). Reports from Germany indicate a need and desire among students for more opportunities to develop these skills, suggesting a potential barrier to optimal and thus sustained use (Budde, Friedrich, et al., 2024). This introduces ChatGPT-specific self-efficacy: the confidence and ability to utilize ChatGPT (e.g., knowing how to ask the right questions, refine outputs, use advanced features). Hong & Chen (2024) examined “ChatGPT self-efficacy” and found it has important indirect effects on continuance. In their study, students with higher ChatGPT self-efficacy *showed higher continuance intention*. This suggests that those who know how to use ChatGPT in a balanced, goal-directed way continue to find value in it (perhaps because they can overcome limitations via skillful prompting). Conversely, students lacking prompt skills may get poor outcomes or become frustrated, hindering continued use (Hong & Chen, 2024; Kovari, 2025).

2.3.3 Synthesis and Transition

A primary and consistent finding across studies is the central role of Perceived Usefulness and Satisfaction as continuance determinants. Studies consistently show that students continue to use ChatGPT when they find it valuable for their academic work and are satisfied with its performance. Another consistent finding is the importance of trust and reliability for an AI-based system. Multiple independent studies (in diverse contexts like the US, India, Korea) underscore that trust in ChatGPT’s answers and proper functioning is positively linked to sustained use (Buchanan & Hickman, 2024; Choudhury & Shamszare, 2023). Beyond these cognitive evaluations, emerging research highlights the powerful behavioral role of Habit. As usage becomes routinized for specific tasks, it can become an automatic and dominant predictor

of continuance, in some cases proving even more influential than Perceived Usefulness. In essence, the literature agrees that a positive user experience (marked by high Perceived Value, Trust, and Satisfaction) is fundamental for encouraging the repeated engagement that allows powerful usage habits to form.

While no studies directly contradict each other, there are nuanced differences in emphasis and some early divergences in findings. One nuance is the role of Perceived Ease of Use. In classical TAM, ease of use is key for adoption; with ChatGPT, some researchers found ease of use still matters (as a precursor to Satisfaction), but others implicitly deem it less critical, given ChatGPT's already intuitive interface (Alshammari et al., 2024; Kelly et al., 2023). This could indicate a minor inconsistency: in some studies ease of use has a significant indirect impact (via Satisfaction) on continuance, whereas in others it's not highlighted – perhaps because ease of use is uniformly high and thus less differentiating among users.

Another difference lies in the inclusion of Trust: certain models (especially those "extended" for AI context) explicitly include Trust and find it critical, while more basic TAM-based models did not measure Trust and thus attribute variance to traditional factors alone (Duong, 2024; Yu et al., 2024). This isn't a direct contradiction in results, rather, it's a difference in scope. For instance, Duong's study found Trust and attitude directly drove continuance intentions, whereas Yu *et al.* focused on system-related factors (efficiency, compatibility) flowing into Satisfaction. Both approaches underscore positive user perceptions, but one highlights *Trust* and the other *Usability*, a subtle conceptual difference.

2.4 Identification of Research Gap

This review of theoretical and empirical literature reveals a clear and critical research gap. While international research has begun to validate the influence of individual factors like usefulness, Satisfaction, and Trust on ChatGPT continuance, this work often investigates these determinants in isolation. As Mun & Hwang (2024) note, comprehensive research into users' post-adoption behaviors remains limited. This gap is particularly pronounced within the German higher education context. Existing German studies provide valuable descriptive data on *that* students are using ChatGPT and *for what* purposes, but a theoretically grounded, integrated model that explains the underlying drivers of *why* they continue to do so is missing. Therefore, this thesis addresses this void by synthesizing established continuance determinants (cognitive and behavioral) with pivotal AI-specific factors (Trust and Accuracy) to empirically investigate the drivers of sustained ChatGPT use specifically among students in Germany.

3. Hypothesis Identification:

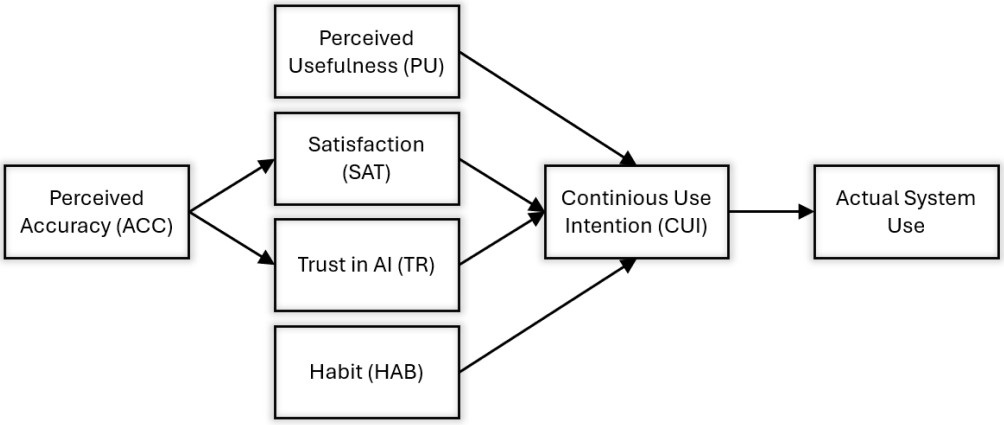
3.1 Research Question and Conceptual Model

To address the research gap identified in the literature review, this thesis is guided by the following central research question:

What are the factors that facilitate the continued use of ChatGPT among students in German higher education?

Based on the synthesis of established continuance theories (TAM, ECM, UTAUT2) and AI-specific factors (Trust, Accuracy), this study proposes and tests a conceptual research model to answer this question. The model, depicted in Figure 4, posits that a student's Continuous Use Intention (CUI) is directly influenced by four key factors: Perceived Usefulness, Satisfaction, Habit, and Trust in AI. Furthermore, it hypothesizes that Perceived Accuracy acts as a crucial antecedent, influencing both Satisfaction and Trust. The specific hypotheses derived from this model are detailed in the following section.

Figure 4
Conceptual Research Model



3.2 Hypothesis

The following hypotheses are proposed as specific, testable propositions derived from the research model. Each is grounded in the theoretical frameworks and empirical evidence synthesized in Chapter 2.

H1: Perceived Usefulness positively influences a student's Continuous Use Intention of ChatGPT for academic tasks.

Grounded in TAM, this hypothesis validates its role in the post-adoption context of ChatGPT, proposing that students who find the tool effective for enhancing their academic performance will intend to continue using it.

H2: Satisfaction with prior use positively influences a student's Continuous Use Intention of ChatGPT for academic tasks.

Drawing from the ECM, this hypothesis tests the proposition that positive prior experiences with ChatGPT will lead to higher Satisfaction and a greater likelihood of sustained use.

H3: Habit positively influences a student's Continuous Use Intention of ChatGPT for academic tasks.

Based on UTAUT2 and continuance research, this hypothesis posits that as ChatGPT becomes an ingrained part of a student's academic routine, Habit becomes a powerful driver of ongoing engagement.

H4: Trust in AI positively influences a student's Continuous Use Intention of ChatGPT for academic tasks.

For generative AI, trust is paramount for user reliance. This hypothesis addresses this AI-specific factor, proposing that a student's confidence in ChatGPT's reliability is a crucial facilitator for its continued use in academic tasks.

H5: AI Literacy positively influences a student's Continuous Use Intention of ChatGPT for academic tasks.

This hypothesis addresses the role of user skill, proposing that a student's AI Literacy directly influences their intention for continued use, linking higher self-efficacy to higher continuance intention. Because skilled users are better able to generate useful outcomes and achieve a more positive experience, they are more likely to develop sustained engagement.

H6a: Perceived Accuracy positively influences a student's Satisfaction with ChatGPT.

H6b: Perceived Accuracy positively influences a student's Trust in ChatGPT.

The reliability of an LLM's output is a primary concern for academic use. This hypothesis tests Perceived Accuracy as a key antecedent, positing that when a student perceives ChatGPT's output as factually correct, it will (a) lead to higher Satisfaction (per ECM) and (b) build confidence in the tool's competence, thereby increasing Trust.

3.3. Exploratory Interviews for Survey Refinement

To develop a robust quantitative survey for empirically testing the study's hypotheses, a preliminary qualitative phase was conducted. The primary objective of this initial stage was to verify the theoretical constructs and hypotheses derived from the literature review, ensuring their relevance and clarity before their operationalization in the final survey. To this end, five semi-structured interviews were conducted with students whose profiles were specifically selected to align with the central research question.

The interview protocol was designed to validate the core concepts (Jack & Raturi, 2006). Each session began with a presentation of the problem statement, followed by the primary research question posed as an open-ended query. The initial analysis focused on whether participants' spontaneous responses aligned with and substantiated the proposed hypotheses. In cases where key concepts were not organically addressed, these were reactively introduced to probe their significance. The findings from this verification process, which are summarized in the following section, provided the foundational confidence to proceed with the development of the survey questions.

The interviews consistently affirmed the foundational role of Perceived Usefulness (H1) and Satisfaction (H2) in driving Continuous Use Intention. Participants unanimously reported that their sustained engagement is contingent on the tool delivering tangible academic benefits, such as significant time savings and effective task support. This utility fosters a cycle of positive reinforcement; successful outcomes generate Satisfaction, which in turn strengthens the intention to continue using the tool for its perceived benefits. Similarly, the concept of Habit (H3) was a salient, albeit divided, theme. For some students, particularly those engaged in frequent and repetitive workflows like coding or daily planning, interaction with ChatGPT had become an automatic, ingrained routine. Others described a more conscious, task-driven engagement, suggesting that while Habit is a powerful facilitator for certain use cases, its development may be contingent on the nature of the academic task and individual workflow patterns.

A more nuanced understanding emerged regarding the AI-specific factors, providing strong qualitative validation for the relationships proposed in H5, H6a, and H6b. The interviews clearly substantiated the direct, positive influence of AI Literacy on students' engagement, as proposed in H5. A recurring sentiment was that the value derived from ChatGPT is not inherent to the tool alone but is co-created through the user's skill. Participants described a distinct learning curve, noting that their ability to achieve high-quality results—and thus their overall

Satisfaction and intention to continue using the tool—increased as they became more adept at crafting precise and effective prompts. This suggests that students with higher confidence in their ability to use the tool effectively are better able to overcome its limitations, leading to a more positive experience and reinforcing their continued use.

Furthermore, the interviews highlighted that student Trust in AI (H4) is not absolute but is a dynamic and conditional judgment fundamentally tethered to its perceived credibility. This provided compelling support for the propositions that Perceived Accuracy is a key antecedent to both Satisfaction (H6a) and Trust (H6b). The most salient finding was a clear distinction in Trust based on the verifiability of the output. For tasks with objectively verifiable outcomes, such as debugging code, Trust was consistently high. In contrast, for tasks involving the generation of factual knowledge for academic research, Trust was markedly low due to the well-known risk of "hallucinations." This demonstrates a sophisticated risk-mitigation strategy among students: they trust the tool for creative and structural tasks but withhold trust for generating citable facts until they are independently verified. This finding powerfully illustrates that a lack of perceived accuracy directly erodes both trust in the tool's competence and Satisfaction with its output for specific, high-stakes academic use cases, validating the foundational role of accuracy in the broader dynamic of continued use.

4 Methodology:

4.1 Research Design & Approach

The research seeks to identify and measure the causal relationships between specific factors and students continued use of ChatGPT. Consequently, this study adopted a deductive approach, beginning with a review of established theories in technology acceptance and continuance (e.g., TAM, UTAUT, ECM) to derive a set of testable hypotheses. To empirically test these hypotheses, a mono-method quantitative research design using a cross-sectional survey was employed. This design is well-suited for efficiently collecting numerical data to examine the predictive relationships between the identified variables and students' Continuous Use Intention for ChatGPT (Saunders et al., 2023; White & Rayner, 2014).

4.2 Survey Instrument Development

A structured online questionnaire was developed to quantitatively measure the constructs from the theoretical framework. To ensure content validity, all constructs were operationalized using validated multi-item scales adapted from seminal and recent academic literature. All

measurement items were rated on a 7-point Likert scale, anchored from 1 ("Strongly Disagree") to 7 ("Strongly Agree").

The key constructs were operationalized as follows:

- **Continuous Use Intention (CUI)**, the dependent variable, was measured as a student's subjective likelihood of using ChatGPT for academic tasks in the future.
- **Satisfaction (SAT)** was defined as the student's overall contentment with prior usage experiences.
- **Perceived Usefulness (PU)** was defined as the degree to which a student believes that ChatGPT enhances academic performance.
- **Habit (HAB)** was measured as the extent to which ChatGPT use has become an automatic and routine behavior within a student's academic workflow.
- **Trust in AI (TRU)** was defined as a student's confidence in ChatGPT's capability and reliability.
- **Perceived Accuracy (ACC)** represented the user's judgment of the factual correctness of the AI's output.
- **AI Literacy (AIL)** was operationalized as a students self-assessed skill in using ChatGPT effectively.

Table 2 provides a summary of all constructs, their definitions, sources (including sources for the validation of constructs), and a sample item for each. The complete survey instrument is presented in Appendix B.

Table 2
Summary of Survey Constructs

Construct	Operational Definition	Source(s)	Sample Item
Perceived Usefulness (PU)	The degree to which a student believes using ChatGPT improves their academic performance.	(Davis, 1989; Venkatesh et al., 2003; Venkatesh & Davis, 2000; Zhu et al., 2022)	"Using ChatGPT enhances my effectiveness in completing academic tasks."
Satisfaction (SAT)	A student's overall contentment and positive feeling about their prior usage of ChatGPT.	(Bhattacherjee, 2001; Ramadan et al., n.d.; Shahzad et al., 2024; Tan et al., 2024)	"My experience of using ChatGPT for my studies has been a positive one."
Habit (HAB)	The extent to which using ChatGPT has become an automatic,	(Limayem et al., 2007; Strzelecki, 2024; Tan et al., 2024)	"The use of ChatGPT has become a habit for me in my academic routine."

	routine behavior for academic tasks.		
Trust in AI (TRU)	A student's confidence in the capability, reliability, and integrity of ChatGPT as a tool.	(Cao & Peng, 2024; Duong, 2024; Kelly et al., 2022; McKnight et al., 2002)	"I feel that ChatGPT is a dependable and reliable AI tool."
Perceived Accuracy (ACC)	A student's assessment of the factual correctness and credibility of information from ChatGPT.	(Delone & McLean, 2003; Kim et al., 2024; Yilmaz et al., 2023)	"I believe the information provided by ChatGPT is generally factually correct."
AI Literacy (AIL)	A student's self-assessed skill in effectively prompting and critically evaluating ChatGPT.	(Hong & Chen, 2024; Kim et al., 2024; Ng et al., 2024)	"I am confident in my ability to write effective prompts to get the academic output I need."
Continuous Use Intention (CUI)	A student's subjective likelihood of continuing to use ChatGPT for academic tasks in the future.	(Bhattacherjee, 2001; Kelly et al., 2022; Shahzad et al., 2024; Venkatesh & Davis, 2000; Yu et al., 2024)	"I intend to continue using ChatGPT for my academic tasks in the future."

4.3 Data Collection Procedure

The data was collected using a self-administered online questionnaire hosted on Qualtrics. The target population was students enrolled in German higher education institutions with prior experience using ChatGPT academically. A non-probability sampling approach, combining convenience and snowball techniques, was used to distribute the survey link via social networks (including WhatsApp and Instagram). Participants were also encouraged to forward the survey to eligible peers. While practical, this method limits the statistical generalizability of the findings, a limitation addressed in Chapter 7 (Guest et al., 2006; Saunders et al., 2023; White & Rayner, 2014).

Data collection occurred over three weeks from July 9, 2025, to August 2, 2025. From 174 initial responses, a final valid sample of 116 was retained for analysis after removing incomplete entries. Ethical protocols were maintained throughout; participants were informed of the study's objectives, their voluntary participation, and the anonymity of their data, providing informed consent by proceeding with the survey (Saunders et al., 2023)

4.4. Data Analysis Strategy

The quantitative data was analyzed using IBM SPSS Statistics (Version 30). The analysis proceeded in three stages.

First, the data was prepared by screening for errors, handling missing data via listwise deletion, and computing composite variables for each construct by averaging the respective item scores. Second, preliminary analyses were conducted (Saunders et al., 2023; White & Rayner, 2014). Descriptive statistics (frequencies, means, standard deviations) were calculated to summarize the sample's demographic profile and the central tendencies of the variables (South et al., 2022). The internal consistency of the multi-item scales was then assessed using Cronbach's Alpha, with a threshold of $\alpha > .70$ considered acceptable (Danneels, 2016; Tutz, 2021).

Finally, inferential statistics were used for hypothesis testing. Bivariate relationships were initially explored using a Pearson correlation matrix. The core hypotheses (H1–H6) were tested with a series of multiple and simple linear regression analyses to determine the predictive influence of the independent variables. Prior to interpretation, regression assumptions were verified. Visual inspection of a normal P-P plot and a scatterplot of residuals confirmed the assumptions of normality, linearity, and homoscedasticity were met. Additionally, multicollinearity was assessed using the Variance Inflation Factor (VIF) and tolerance statistics, with all VIF values falling below the threshold of 2, indicating that multicollinearity was not a concern in the model (Saunders et al., 2023; White & Rayner, 2014).

Figure 5

Normal P-P Plot of Regression Standardized Residual

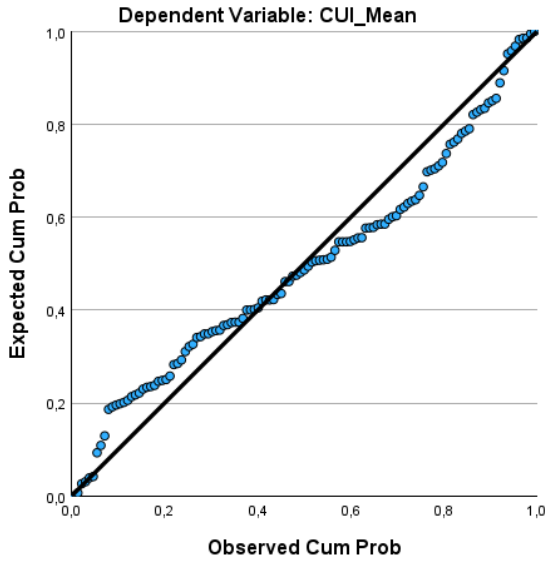
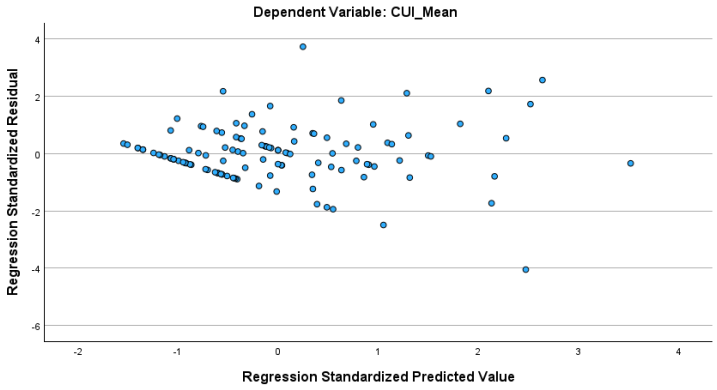


Figure 6
Scatterplot



5 Results

This chapter presents the results of the quantitative data analysis. The findings are reported without interpretation, which will follow in Chapter 6.

5.1 Data Screening and Sample Demographics

Gender and Age: The participants' ages ranged from 18 to 39, with a mean age of 25.24 years (*SD* = 2.83). The most represented age groups were 26-year-olds (22.4%, n=26) and 25-year-olds (19.8%, n=23). Regarding gender, 32.8% identified as female (n = 38), 62.9% as male (n = 73), and 4.3% preferred not to say (n = 5).

Figure 7
Pie Chart Count of "What is your gender?"

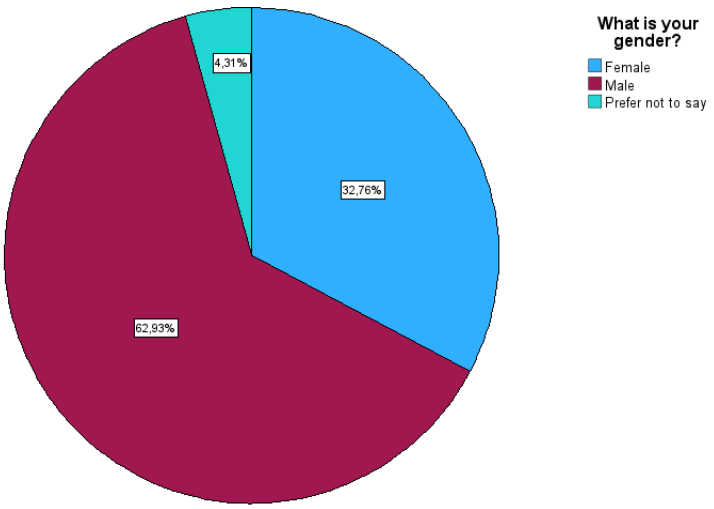
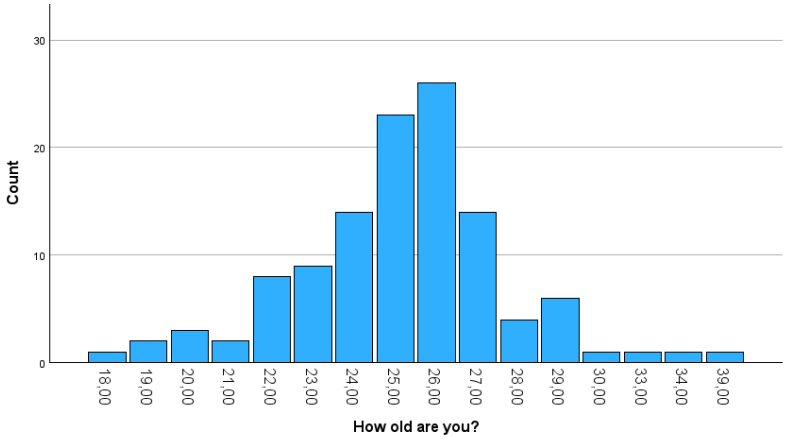


Figure 8
Bar Count of "How old are you?"



Level and Field of Study: In terms of study level, 40.5% were enrolled in a bachelor's program, 51.7% in a master's program, 2.6% in a Staatsexamen program, and 5.2% reported other study levels. The majority of respondents (68.1%) reported studying in Business & Economics (n = 79), followed by Computer Science & Information Systems (11.2%, n = 13), Social Sciences (6.9%, n = 8), Engineering (5.2%, n = 6), Natural Sciences & Mathematics (2.6%, n = 3), Law (1.7%, n = 2), Humanities & Cultural Studies (0.9%, n = 1), and other fields (3.4%, n = 4).

Figure 9
Bar Count of "What is your current primary level of study?"

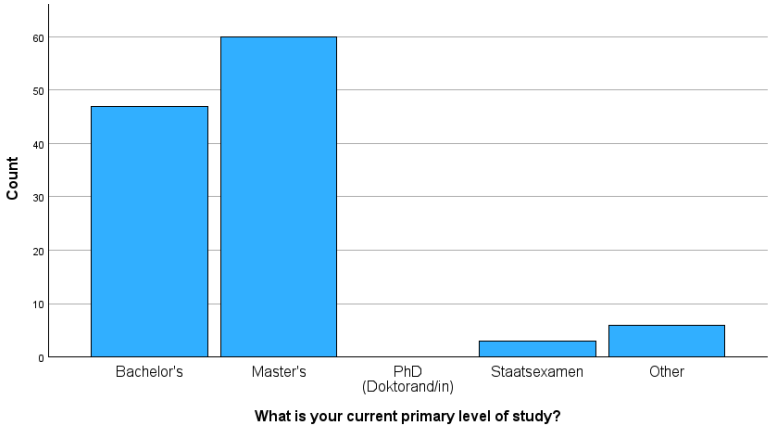
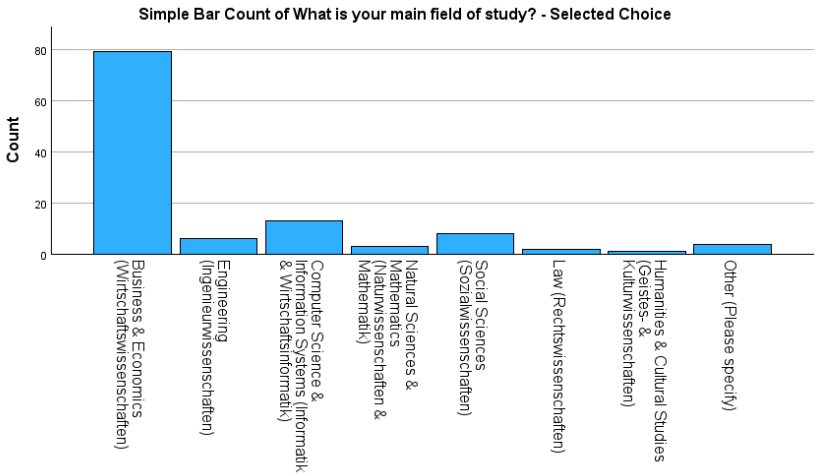


Figure 10
Bar Count of "What is your main field of study?"



ChatGPT Usage Characteristics: In terms of ChatGPT usage, 44.0% used the free version exclusively (n = 51), 50.0% used the paid/plus version (n = 58), and 6.0% used both equally (n = 7). Regarding the duration of academic use, 3.4% had used ChatGPT for less than 1 month, 14.7% for 1–6 months, 18.1% for 6 months to 1 year, 40.5% for 1–2 years, and 23.3% for more than 2 years.

Figure 11
Pie Chart Count of "Which version of ChatGPT do you primarily use?"

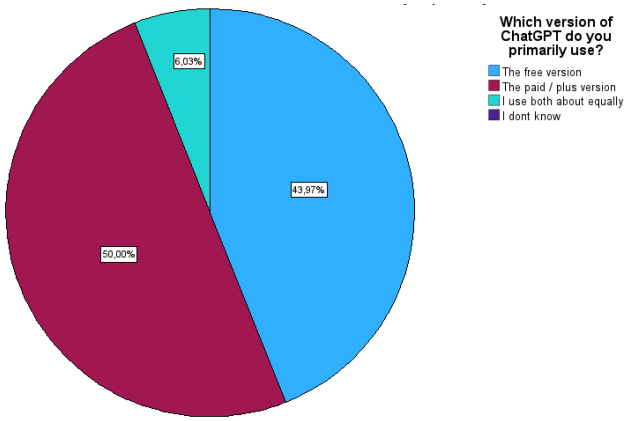
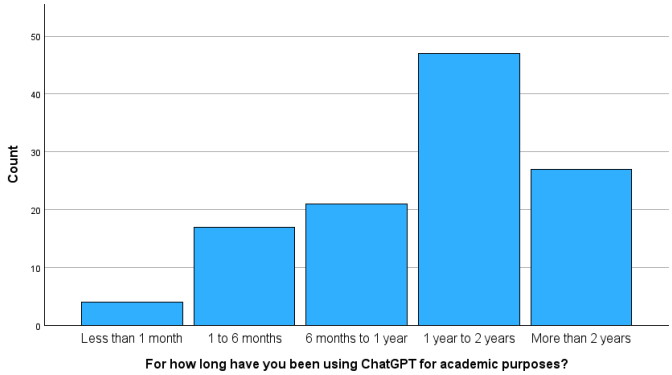


Figure 12
Bar Count of "For how long have you been using ChatGPT for academic purposes?"



5.2 Descriptive Statistics, Reliability, and Correlation Analysis

Descriptive statistics and the internal consistency of the measurement scales were calculated for all core constructs. As shown in Table 5.1, most multi-item scales demonstrated acceptable to excellent internal consistency, with Cronbach's alpha coefficients ranging from .748 to .849. Perceived Ease of Use (PEOU) had a lower reliability (α=.575), and results related to this construct should be interpreted with caution.

Table 3
Descriptive Statistics and Internal Consistency of Constructs

Construct	Number of Items	Cronbach's Alpha	N	Minimum	Maximum	Mean	Std. Deviation
PEOU	3	0.575	116	1.00	6.33	2.4226	1.01440
PU	3	0.796	116	1.00	6.00	1.9843	0.97938
ACC	3	0.849	116	1.00	7.00	3.5617	1.25195
SAT	3	0.846	116	1.00	6.67	2.3412	1.09066
TRU	3	0.748	116	1.00	6.00	2.8478	0.99093
HAB	3	0.826	116	1.00	6.00	2.3609	1.18211
AIL	3	0.779	116	1.00	7.00	2.5207	1.08687
CUI	3	0.847	116	1.00	5.67	1.9201	1.00832

Pearson correlation analysis was conducted to assess the bivariate relationships between the key variables. The results, presented in Table 4, show that Continuous Use Intention (CUI) is significantly and positively correlated with all independent variables except for Perceived Accuracy (ACC). The strongest positive correlations with CUI were observed for Habit (r = .627, p < .001), Perceived Usefulness (r = .562, p < .001), and Satisfaction (r = .557, p < .001). Trust in AI was weakly but significantly correlated with CUI (r = .199, p = .028).

Table 4
Bivariate Correlation Matrix

	PEUO	PU	ACC	SAT	TR	HAB	AIL	CUI
PEUO	1	0.472**	0.413**	0.392**	0.427**	0.272**	0.515**	0.415**
PU	0.472**	1	0.229*	0.519**	0.271**	0.398**	0.530**	0.562**
ACC	0.413**	0.229*	1	0.246*	0.448**	0.031	0.146	0.033
SAT	0.392**	0.519**	0.246*	1	0.430**	0.556**	0.466**	0.557**
TR	0.427**	0.271**	0.448**	0.430**	1	0.276**	0.238*	0.199*
HAB	0.272**	0.398**	0.031	0.556**	0.276**	1	0.374**	0.627**
AIL	0.515**	0.530**	0.146	0.466**	0.238*	0.374**	1	0.522**
CUI	0.415**	0.562**	0.033	0.557**	0.199*	0.627**	0.522**	1

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

5.3 Hypothesis Testing

A series of linear regression analyses were performed to test the proposed hypotheses. An alpha level of .05 was used to determine statistical significance.

Predictors of Continuous Use Intention (H1–H5)

To investigate predictors of Continuous Use Intention, a multiple linear regression was conducted with Perceived Usefulness, Satisfaction, Habit, Trust in AI, and AI Literacy entered simultaneously as predictors. The overall model was statistically significant and explained 55.6% of the variance in CUI: (R^2 = .556, Adjusted R^2 = .536, $F(5, 115) = 28.780$, $p < .001$). Habit was the strongest significant predictor (β = .392, t = 5.147, p < .001), followed by Perceived Usefulness (β = .244, t = 3.105, p = .002), and AI Literacy (β = .191, t = 2.492, p = .014). Satisfaction was marginally non-significant (β = .162, t = 1.880, p = .063), while Trust in AI did not have a significant effect (β = −.087, t = −1.264, p = .209). Thus, H1, H3, and H5 were supported; H2 and H4 were not supported.

Table 5
Linear Regression Coefficients (Dependent Variable: CUI)

Predictor	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	0.082	0.223		0.369	0.713		
PU	0.249	0.080	0.244	3.105	0.002	0.623	1.605
SAT	0.148	0.079	0.162	1.880	0.063	0.519	1.927
HAB	0.335	0.065	0.392	5.147	<0.001	0.665	1.505
TR	-0.087	0.069	-0.087	-1.264	0.209	0.813	1.230
AIL	0.177	0.071	0.191	2.492	0.014	0.660	1.515

Antecedents of Satisfaction and Trust (H6a & H6b)

To further investigate antecedents of Satisfaction and Trust, two separate simple linear regressions were performed using Perceived Accuracy as the predictor. Perceived Accuracy was found to be a significant positive predictor of Satisfaction ($R^2 = .061$, $F(1, 125) = 8.053$, $p = .005$), with a standardized coefficient of $\beta = .246$ ($t = 2.838$, $p = .005$), supporting H6a. For Trust in AI, Perceived Accuracy was also a significant positive predictor, explaining 20% of the variance ($R^2 = .200$, $F(1, 125) = 31.322$, $p < .001$), with $\beta = .448$ ($t = 5.597$, $p < .001$), supporting H6b.

Table 6

Summary Table of Hypotheses Testing

Hypothesis	Path	Predicted Effect	Result
H1	PU → CUI	+	Supported
H2	SAT → CUI	+	Not Supported
H3	HAB → CUI	+	Supported
H4	TR → CUI	+	Not Supported
H5	AIL → CUI	+	Supported
H6a	ACC → SAT	+	Supported
H6b	ACC → TR	+	Supported

6 Discussion

6.1 Summary of Key Findings

This study sought to identify the factors that facilitate the continued use of ChatGPT among students in German higher education. The multiple regression analysis revealed a clear hierarchy of predictors. Habit emerged as the most powerful determinant of Continuous Use Intention (CUI), followed by Perceived Usefulness and, notably, AI Literacy. These three factors all demonstrated significant, positive direct effects on a student's intention to continue using ChatGPT for academic tasks. Contrary to initial hypotheses, Satisfaction was only marginally non-significant in the final model, while Trust in AI did not exert a significant direct effect on CUI. Furthermore, the analysis of antecedent relationships was revealing. As hypothesized, Perceived Accuracy was a strong and significant positive predictor of both Satisfaction (H6a) and Trust in AI (H6b).

In summary, H1 (PU), H3 (HAB), H5 (AIL), H6a (ACC -> SAT), and H6b (ACC -> TR) were supported. H2 (SAT) and H4 (TR) were not supported in the main regression model. The

remainder of this chapter will interpret these findings, discuss their theoretical and practical implications, and conclude by synthesizing their meaning for the field.

6.2 Interpretation of Findings

The study's results provide a nuanced understanding of why students continue to use ChatGPT, revealing a dynamic interplay between powerful behavioral patterns, foundational cognitive evaluations, critical AI-specific perceptions, and the pivotal role of user skill.

The Dominance of Habit and Perceived Value (H1, H3)

The most striking finding of this study is the emergence of Habit as the single strongest predictor of Continuous Use Intention (β=.392). This strongly supports H3 and aligns with post-adoption continuance models like UTAUT2, which posit that as technology use becomes routine, it transitions from a conscious, deliberate choice to a more automatic behavior. This result is consistent with recent empirical work, such as that by Strzelecki (2024), who also found Habit to be a dominant factor in students' intention to use ChatGPT. For a tool like ChatGPT, which can be applied to frequent and recurring academic tasks, it is logical that its integration into a student's daily workflow would solidify into a habit, becoming a default action that requires minimal cognitive effort to initiate. This quantitative finding is further illuminated by the preliminary interviews, where students described an almost automatic reliance on the tool for specific, repetitive tasks like coding.

While Habit was the strongest predictor, the foundational driver of Perceived Usefulness (H1) was also strongly supported (β = .244). This confirms the core tenet of the Technology Acceptance Model (TAM): users will continue to engage with a technology only if they believe it enhances their performance (perceived utility drives behavioral intention). These two findings tell a coherent story of technology integration: students initially engage with ChatGPT because they perceive it to be useful. This perceived utility encourages the repeated use necessary for a behavior to become automatic, at which point Habit emerges as the primary driver of ongoing engagement.

The Emergence of User Skill as a Direct Driver of Continuance (H5)

A significant and novel finding of this study is the direct, positive influence of AI Literacy on Continuous Use Intention (β = .191), providing strong support for H5. This result reframes user skill not merely as a background factor but as a key determinant of sustained engagement. The interpretation is twofold. First, students who are more confident in their ability to use ChatGPT effectively are more likely to achieve their desired outcomes. This success leads to a more positive and less frustrating user experience, which directly encourages continued use.

Second, and more profoundly, this finding suggests that the "usefulness" of a generative AI tool is not a static property of the technology itself but is co-created and unlocked by the user's competence. A skilled user can turn a generic or mediocre output into a valuable academic asset through iterative prompting and critical refinement. Therefore, students with high AI Literacy perceive a more powerful and versatile tool than their less-skilled peers, which logically strengthens their intention to keep using it. This highlights a critical distinction between traditional software and generative AI: with the latter, the user's skill is an active ingredient in determining the value and, consequently, the long-term adoption of the technology.

The Nuanced and Indirect Roles of Satisfaction and Trust (H2, H4, H6a, H6b)

A more complex picture emerges around Satisfaction and Trust. In the main regression model, neither Satisfaction (H2, $p = .063$) nor Trust in AI (H4, $p = .209$) were significant predictors of CUI. This is a notable result, as both are typically considered core drivers in continuance models. However, this does not render them irrelevant.

The strong support for H6a and H6b establishes Perceived Accuracy as a critical foundational element. As hypothesized, accuracy was a significant positive predictor of both Satisfaction ($\beta = .246$) and Trust ($\beta = .448$). This is logical; if a generative AI tool is perceived as producing incorrect information, it will erode both user trust and Satisfaction.

The non-significant direct effects of Satisfaction and Trust in the main model are likely due to statistical mediation and the overwhelming influence of other variables. The bivariate correlations showed that both Satisfaction and Trust were significantly correlated with CUI. However, when placed in a model alongside the more powerful predictors of Habit, Usefulness, and AI Literacy, their unique explanatory power diminishes. This suggests that Satisfaction and Trust function less as direct drivers and more as crucial antecedents. A student must first perceive the tool as accurate enough to be trustworthy (H6b) and to generate satisfactory results (H6a). This baseline of Satisfaction and Trust then enables the perceptions of usefulness and the repeated use necessary for a habit to form.

This interpretation is strongly supported by the preliminary qualitative findings, which revealed that students' trust is highly conditional and task-dependent. Interviewees expressed high trust for verifiable tasks like coding but very low trust for academic research where the risk of "hallucinations" is high. This indicates that students engage in a sophisticated risk assessment, granting a baseline of selective, task-appropriate trust before relying on the tool. In essence, while Accuracy, Trust, and Satisfaction may not be the final drivers of the decision to continue, they are the essential "gateway" conditions without which sustained use would be unlikely.

6.3 Theoretical Implications

The findings of this study offer several specific refinements to the theory of technology continuance, particularly in its application to generative AI.

First, the sheer dominance of Habit suggests a necessary contextualization of post-adoption models like UTAUT2. While the model already includes Habit, these results imply that its predictive weight is not static but is contingent on the technology's characteristics. For versatile, high-frequency tools like ChatGPT that can be integrated into numerous daily routines, Habit may function as a disproportionately powerful, even overriding, determinant of continued use, diminishing the relative influence of more deliberate cognitive factors like Satisfaction in mature usage stages.

Second, the study challenges the simplistic inclusion of Trust as a direct predictor of intention in AI continuance models. The findings strongly suggest a revised conceptualization where Trust, alongside Perceived Accuracy, functions as a foundational "hygiene factor" or an essential antecedent. A more robust theoretical model would therefore position these AI-specific factors as necessary preconditions that enable the formation of the core drivers. In this revised model, a baseline of task-appropriate trust is required for a user to engage with the tool sufficiently to form the perception of Usefulness which then, through repeated use, solidifies into Habit. This positions Trust not as a direct driver of *intention*, but as a critical enabler of the entire continuance process.

Finally, the significant direct effect of AI Literacy on continuance intention suggests a necessary extension to traditional models. For technologies where the user actively co-creates the value of the output, "user competence" should be considered a primary determinant alongside instrumental beliefs like usefulness. The value proposition of generative AI is not fixed but is elastic, stretching with the user's skill. Furthermore, this suggests that high AI Literacy may act as a compensatory factor; skilled users, who are better able to navigate the tool's flaws and limitations, may be less influenced by temporary drops in Satisfaction or Trust. Future continuance models for such technologies should explicitly account for this dynamic by incorporating user literacy or self-efficacy as a core independent variable.

6.4 Practical Implications

The findings provide actionable insights for several stakeholders within the German higher education system.

- **For University Administrators and Policymakers:** The finding that ChatGPT use quickly becomes a habit underscores the futility of outright bans. Instead, the central focus should

be on building AI Literacy. The fact that AI Literacy is a direct driver of continued use means that empowering students with the skills to use these tools effectively is the most sustainable path to ensuring their responsible and productive integration. Institutions must invest in training students not only to critically evaluate AI content (to address the importance of Perceived Accuracy) but also to master advanced prompting techniques.

- **For Educators:** Teaching staff should recognize that students will most likely continue to use ChatGPT when it demonstrably enhances their academic work and becomes a part of their regular routine. The strong influence of Perceived Usefulness implies that educators are key in shaping whether students use AI tools productively or as a shortcut for academic dishonesty. To foster effective use, educators can design assignments that require the skilled application of ChatGPT as a tool rather than as a simple answer-generator. By demonstrating its value for specific, legitimate academic tasks, educators can steer its use in a direction that enhances learning rather than circumventing it.
- **For Students:** This study shows that the sustained value of ChatGPT comes from its deliberate integration into academic workflows. Students can benefit from consciously identifying recurring tasks (e.g., structuring essays, refining prose, summarizing lecture notes) where the tool can be applied consistently, thereby building productive habits. The results also serve as a crucial reminder of the tool's limitations; the findings on Accuracy and conditional Trust highlight the non-negotiable responsibility of every student to critically verify any factual information generated by the AI before incorporating it into their academic work.
- **AI Developers and Product Teams:** For those who design, develop, and maintain ChatGPT and comparable systems, these findings underline the paramount importance of output accuracy and trustworthiness. Investments in reducing "AI hallucinations," enhancing fact-checking mechanisms, and providing transparent explanations for outputs are essential. Accessible user interfaces remain crucial, but as students become routine users, developer focus should increasingly shift to advanced features, such as customizable prompting, academic mode settings, and real-time accuracy feedback. Additionally, developers can contribute to academic ethics and utility by providing educational resources, guidance for responsible use, and partnerships with academic institutions to align product capabilities with curricular needs

7 Conclusion

7.1 Summary of the Research

The rapid spread of generative Artificial Intelligence, exemplified by OpenAI's ChatGPT, has presented a paradigm shift for higher education institutions globally. Within the German academic landscape, the swift and widespread adoption of this technology by students has moved beyond novelty to become a notable feature of contemporary academic life. However, beyond initial adoption rates, a critical gap persists in understanding the specific determinants that facilitate the long-term, sustained integration of these tools into students' academic workflows. This thesis sought to address this gap by empirically investigating the underlying drivers of ongoing engagement. It was therefore guided by the central research question: What are the factors that facilitate the continued use of ChatGPT among students in German higher education?

In response to the central research question, this study identifies a clear hierarchy of factors driving the sustained use of ChatGPT. The most powerful determinant is Habit, indicating that for many students, engagement with the tool has transitioned from a series of deliberate choices into a routinized and automatic component of their academic workflow. This behavioral automaticity is built upon a foundation of perceived value, as Perceived Usefulness also emerged as a strong, significant predictor. Crucially, this study identified AI Literacy as a third significant direct driver, revealing that a student's self-assessed skill in using the tool is a key factor in their intention to continue. Furthermore, the entire dynamic is predicated on the tool's perceived credibility; while Trust in AI was not a direct driver of intention, its crucial antecedent, Perceived Accuracy, proved to be a non-negotiable baseline, fundamental to achieving the user Trust and Satisfaction necessary for initial and repeated engagement.

7.2 Limitations of the Study

The findings of this study should be considered in light of several methodological limitations. First, regarding the research design and scope, the study’s cross-sectional nature captures student perceptions at a single point in time, which allows for the identification of predictive relationships but precludes any claims of causality. This "snapshot" approach is particularly constraining in the exceptionally fast-moving field of generative AI, as the results may not account for the influence of technological advancements or new institutional policies that emerged after the data collection period of mid-2025. Furthermore, the research model, while grounded in established theory, necessarily simplifies a complex phenomenon and omits other potentially relevant constructs, such as Social Influence or Facilitating Conditions .

Second, the external validity and generalizability of the findings are further constrained by the non-probability convenience sampling method and the specific demographic composition of the respondent pool. The resulting sample was not statistically representative of the broader German student population and was notably skewed towards students in Business & Economics (68.1%). This disciplinary concentration may have amplified the significance of performance-oriented constructs like Perceived Usefulness. It is plausible that students in these fields are inherently more attuned to technologies that promise enhanced productivity, making PU a particularly salient driver for this group. Consequently, the identified hierarchy of influencing factors may not be universally applicable across all academic disciplines, such as the humanities or theoretical sciences.

Finally, the study is subject to measurement limitations. A primary limitation is the reliance on Continuous Use Intention as the dependent variable rather than a direct measure of actual behavior. While intention is a strong predictor in IS research, a gap can exist between intended and actual use. Moreover, the exclusive use of self-reported data introduces the risk of common method bias and subjective inaccuracies, particularly for constructs like self-assessed AI Literacy and Habit. Compounding this is a specific issue of measurement reliability, as the scale for Perceived Ease of Use (PEOU) demonstrated low internal consistency (α=.575), which limited its utility for more complex analyses and reaffirmed the decision to focus on a direct effects model.

7.3 Avenues for Future Research

These limitations naturally illuminate several promising avenues for future research that can build upon and extend this study's findings. To move beyond the static, cross-sectional snapshot of this research, a longitudinal study is a critical next step. Tracking a cohort of students over an academic year would allow researchers to observe the dynamic process of Habit formation, identifying the specific conditions and timeframes under which initial, deliberate use crystallizes into automatic behavior. Future research should also seek to enhance external validity by employing a stratified sampling method to ensure a representative sample across diverse academic disciplines. A comparative analysis between students in fields such as the humanities, natural sciences, and engineering would reveal whether the strong performance-oriented drivers identified in this business-centric sample are universal or context-dependent. To address the limitations of self-reported data, subsequent studies could employ objective measures, such as performance-based tasks to assess AI Literacy or actual usage analytics captured via plugins, providing more robust data than subjective self-assessments. Finally, the

finding that Trust operates as a mediated antecedent rather than a direct driver calls for research specifically designed to test this proposed causal pathway, for instance, through a structural equation model (SEM) analysis with a larger dataset to formally validate these complex interrelationships.

7.4 Final Concluding Remarks

Ultimately, this research reveals that the integration of generative AI into academic life is not merely a matter of conscious adoption of a new tool, but a rapid process of behavioral conditioning. The swift formation of Habit as the primary driver of continued use demonstrates that for many students, ChatGPT is already becoming an almost unconscious extension of their cognitive toolkit. This transition from deliberate instrument to ingrained practice represents a fundamental and likely irreversible shift in the nature of academic work and learning. Consequently, the challenge for higher education is no longer about whether to engage with this technology, but about how to proactively and ethically shape the new academic habits that are already being formed, ensuring they enhance, rather than erode, the core principles of critical thought and scholarly inquiry.

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Appendix

Appendix A: Preliminary Interviews

Summary for Interview 1 (Benjamin)

Benjamin is a 23-year-old undergraduate student in Business Informatics (*Wirtschaftsinformatik*). Benjamin framed his continued use of ChatGPT primarily through his experience with academic coding tasks. His perspective was dominated by two key themes: powerful habit formation and highly conditional trust. For routine coding, usage became so frequent and integrated that it evolved into an automatic, indispensable habit, stating, "you don't necessarily code on your own anymore basically because you're so getting used to using ChatGPT." This illustrates a strong link between repeated use and habit (H3). Conversely, his trust in the system was starkly divided; it was very high for coding, where outputs could be easily verified, but remained low for academic research due to concerns about fabricated sources. This highlights how Perceived Accuracy (H5) directly dictates the level of Trust (H4) depending on the specific task.

Summary for Interview 2 (Leoni)

Leoni is a 26-year-old graduate student in Marketing. Leoni's perspective centered on the evolution of ChatGPT's functionality and her own developing skill in using it. Her continued use is motivated by the tool's increasing usefulness, such as the ability to upload documents, which overcame initial frustrations. A key insight from this participant was the importance of AI Literacy (H6) in enhancing the user experience. She articulated a clear learning curve, noting that "over the time of usage it gets easier to phrase things the way they make sense... so that you get immediately the response you need." While she has established usage habits for smaller tasks, her trust remains cautious for high-stakes academic work, indicating a need for personal verification. Her overall sentiment is that continued use is contingent on both the tool's improvement and their own ability to use it effectively.

Summary for Interview 3 (Carlo)

Carlo is a 26-year-old graduate student in Engineering. Carlo presented a highly pragmatic and task-oriented view, emphasizing that his continued use of ChatGPT is a conscious, deliberate choice rather than a habit. For this participant, Perceived Usefulness (H1), specifically in the

form of "the time savings aspect," is the single most important driver. He explicitly rejected the idea of automaticity, stating, "I don't think that I automatically always go to ChatGPT when something is popping up." His perspective also strongly connected AI Literacy to Perceived Ease of Use (H6), explaining that knowing how to properly prompt and interact with the tool makes it significantly easier to achieve desired results. His satisfaction is derived from efficiency, and his trust is conditional upon the credibility of sources, making his engagement a calculated, results-driven process.

Summary for Interview 4 (Jonas)

Jonas is a 22-year-old undergraduate student in International Business. The perspective of Jonas was strongly characterized by the intertwined roles of habit and trust as primary drivers of continued use. He described his engagement as deeply routinized, having formed a daily habit of using ChatGPT to structure his academic tasks. This routine is sustained by high prior satisfaction (H2). Crucially, this participant identified trust as the most critical factor for deeper integration and sustained reliance. He expressed that his intention to use the tool more extensively is directly tied to its reliability, stating, "if the information is really good and I can trust them, I'm going to use ChatGPT more and more and replace normal Google search." This view positions Trust (H4), built upon Perceived Accuracy (H5), as the key facilitator for transitioning from a supplementary tool to a primary information source.

Summary for Interview 5 (Simon)

Simon is a 23-year-old undergraduate student in Business Administration. Simon offered a distinctly pragmatic and results-focused perspective, viewing ChatGPT as a tool that must prove its worth for specific tasks. His approach is not driven by habit but by a conscious decision based on effectiveness; as he put it, "the results... are the most important factor for me." This participant's concept of Trust (H4) and Accuracy (H5) was uniquely functional: for tasks like coding, trust is high simply "if the code works," regardless of its origin. They also saw a clear, instrumental value in AI Literacy, believing that greater knowledge of the tool's capabilities directly leads to better results, which in turn motivates continued use. Their overall sentiment is that sustained engagement is maintained as long as the tool provides a superior, functional outcome for a given task compared to alternatives.

Appendix B: Survey

Start of Block: Introduction & Consent

Q1 **An Academic Study on the Use of Generative AI Tools in German Higher Education** The purpose of this master's thesis survey is to understand the factors that influence the continuous use of ChatGPT for academic work. The survey is intended for all students enrolled at a higher education institution in Germany Your participation is voluntary and anonymous. All data collected will be kept confidential and used solely for academic research purposes. The survey should take approximately 5 minutes to complete Researcher Information: Kian Taheri, Católica Lisbon School of Business & Economics, s-ktaheri@ucp.pt

End of Block: Introduction & Consent

Start of Block: Screening Questions

Q2 Are you currently enrolled as a student at a higher education institution in Germany?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you currently enrolled as a student at a higher education institution in Germany? = No

Q3 Have you used ChatGPT for academic purposes before (e.g., for brainstorming ideas, summarizing texts, drafting content, debugging code, etc.)?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Have you used ChatGPT for academic purposes before (e.g., for brainstorming ideas, summarizing te... = No

End of Block: Screening Questions

Start of Block: Your Experience with ChatGPT

Q4 The following statements relate to your personal experiences and perceptions of using ChatGPT **for your academic work**. There are no right or wrong answers. Please indicate the extent to which you agree or disagree with each statement based on your own experience. For each statement, please indicate your level of agreement on the 7-point scale ranging from "Strongly Disagree" to "Strongly Agree".

End of Block: Your Experience with ChatGPT

Start of Block: Perceptions of Using ChatGPT

Q5 Ease of Use and Usefulness

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
My interaction with ChatGPT is clear and understandable (1)	○	○	○	○	○	○	○
I find ChatGPT to be easy to use (2)	○	○	○	○	○	○	○
It does not take a lot of mental effort to use ChatGPT for my academic tasks (3)	○	○	○	○	○	○	○
Using ChatGPT improves my performance in my studies (7)	○	○	○	○	○	○	○
Using ChatGPT enhances my effectiveness in completing academic tasks (8)	○	○	○	○	○	○	○
Overall, I find ChatGPT to be a useful tool for my academic work (9)	○	○	○	○	○	○	○

Q6 Accuracy of ChatGPT for academic tasks

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
I believe the information provided by ChatGPT is generally factually correct (1)	○	○	○	○	○	○	○
ChatGPT provides precise and reliable information for my academic queries (2)	○	○	○	○	○	○	○
I consider the outputs I receive from ChatGPT to be credible (3)	○	○	○	○	○	○	○

Q7 Your satisfaction with ChatGPT

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
I am satisfied with my decision to use ChatGPT for academic tasks (1)	○	○	○	○	○	○	○
My experience of using ChatGPT for my studies has been a positive one (2)	○	○	○	○	○	○	○
Overall, I am pleased with the support ChatGPT provides for my academic work (3)	○	○	○	○	○	○	○

Q8 Your trust in ChatGPT

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
I am confident in the capabilities of ChatGPT to perform the academic tasks I ask of it (1)	○	○	○	○	○	○	○
I feel that ChatGPT is a dependable and reliable AI tool (2)	○	○	○	○	○	○	○
I trust that ChatGPT will provide suggestions that are in my best interest for my academic goals (3)	○	○	○	○	○	○	○

Page Break

Q9 Habit

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
The use of ChatGPT has become a habit for me in my academic routine (1)	○	○	○	○	○	○	○
I find myself using ChatGPT automatically for certain types of academic tasks (2)	○	○	○	○	○	○	○
Using ChatGPT has become a natural part of my study process (3)	○	○	○	○	○	○	○

Q10 Your ability to use ChatGPT

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
I am confident in my ability to write effective prompts to get the academic output I need from ChatGPT (1)	○	○	○	○	○	○	○
I know how to critically evaluate the information provided by ChatGPT for potential biases and inaccuracies (2)	○	○	○	○	○	○	○
I have a good understanding of the key limitations of what ChatGPT can and cannot do reliably (3)	○	○	○	○	○	○	○

Q11 Your intention to continue using ChatGPT

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
I intend to continue using ChatGPT for my academic tasks in the future (1)	○	○	○	○	○	○	○
I will frequently use ChatGPT in the coming months for my studies. (2)	○	○	○	○	○	○	○
I plan to continue using ChatGPT as a regular part of my academic toolkit (3)	○	○	○	○	○	○	○

End of Block: Perceptions of Using ChatGPT

Start of Block: Demographic and Contextual Information

Q12 Finally, please provide some general information about yourself. This data is collected for statistical purposes only and will remain anonymous

Q13 What is your **current** primary level of study?

- ○ Bachelor's (1)
- ○ Master's (2)
- ○ PhD (Doktorand/in) (3)
- ○ Staatsexamen (4)
- ○ Other (5)

Q14 What is your main field of study?

- Business & Economics (Wirtschaftswissenschaften) (1)
- Engineering (Ingenieurwissenschaften) (2)
- Computer Science & Information Systems (Informatik & Wirtschaftsinformatik) (3)
- Natural Sciences & Mathematics (Naturwissenschaften & Mathematik) (4)
- Medicine & Health Sciences (Medizin & Gesundheitswissenschaften) (5)
- Social Sciences (Sozialwissenschaften) (6)
- Law (Rechtswissenschaften) (7)
- Humanities & Cultural Studies (Geistes- & Kulturwissenschaften) (8)
- Arts & Design (Kunst & Gestaltung) (9)
- Other (Please specify) (10) _____

Q15 For how long have you been using ChatGPT for academic purposes?

- Less than 1 month (1)
- 1 to 6 months (2)
- 6 months to 1 year (3)
- 1 year to 2 years (4)
- More than 2 years (5)

Q16 Which version of ChatGPT do you primarily use?

- The free version (1)
- The paid / plus version (2)
- I use both about equally (3)
- I dont know (4)

Q17 How old are you?

_____

Q18 What is your gender?

- Female (1)
- Male (2)
- Prefer not to say (3)

End of Block: Demographic and Contextual Information

Appendix C: Regression Results

For hypothesis H6a

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,578	,285		5,536	<,001
	ACC	,214	,076	,246	2,838	,005

a. Dependent Variable: SAT

For hypothesis H6b

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,586	,239		6,638	<,001
	ACC	,354	,063	,448	5,597	<,001

a. Dependent Variable: TR