

# UNVEILING THE IMPACT OF AI CHATBOTS ON HIGHER EDUCATION: INSIGHTS FROM STUDENTS

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## Abstract

This proposal outlines a paper presentation focusing on AI chatbots' role in teaching and learning practices. The study was conducted by academic developers at the Western Norway University of Applied Sciences (HVL), in Norway. The study explores students' perceptions and usage of AI chatbots, offering critical insights into the evolving landscape of higher education[1]. We have a university pedagogical point of view and are interested in understanding the students' reflections on the new challenges and opportunities in teaching and learning in higher education.

This study broadens our understanding of how we can improve teaching and learning in higher education. The purpose of the study was to (I) Explore the extent of students' engagement with AI chatbots in higher education (II) Investigate students' use and perception of AI chatbots in higher education. The mixed method study involved an anonymous survey of 2822 HVL students, combining closed and open-ended responses. We analysed the material using frequency analysis and a descriptive content analysis.

In this paper, we will give examples of how students use AI chatbots constructively in academic writing and as a "teaching assistant" providing explanations and feedback on course content. However, we will also shed light on the uncertainty they express when it comes to using AI tools in an ethical sound way. We will explore the implications of the study for both students and teachers. The paper highlights the necessity of enhancing educators and students' digital competencies related to implementing AI chatbots in teaching and learning. We invite the audience to engage in a critical discussion of key questions we as educators need to address, to be able to support students in using AI chatbots in teaching and learning practices in higher education.

Keywords: AI chatbots, Higher education, Student perceptions, Learning practices, Pedagogy, Ethical considerations.

## 1 INTRODUCTION

The study presents the role of AI chatbots in teaching and learning practices and maps the use and perceptions of artificial intelligence (AI) and AI chatbots such as ChatGPT, Bard, etc. in education among HVL students. We mainly refer to ChatGPT-3.5 when we write ChatGPT. GPT-4 was at the time of the data collection, a more advanced version of ChatGPT that was behind a paywall.

The premise for the study is based on a sociocultural perspective, where learning is linked to social and cognitive processes in mutual dependence with each other[2, 3]. We introduce relevant research and theory related to AI chatbots in higher

education, with a focus on the individual use of AI chatbots in academic writing and the use of AI chatbots as a “teaching assistant” providing explanations and feedback on course content.

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A systematic literature review [4] on the use of ChatGPT as a writing assistant in academic writing across different fields shows that ChatGPT has a help and support function for both students and teachers in higher education. Imran & Almusharraf [4] also found that ChatGPT can help with generating text, initial drafts, brainstorming ideas, and summaries of the literature, but it cannot replace human writers in various skills and knowledge.

According to its official page, ChatGPT may produce biased and harmful content due to the unavailability of some latest information, especially after September 2021. The information generated by ChatGPT may also be incorrect [5, 6]. ChatGPT and AI can challenge academic writing techniques and domains, with both positive and negative aspects. It is important to integrate human control with ChatGPT for maximum utilization, and not rely solely on it for writing tasks[4].

The rapidly evolving nature of AI and ChatGPT, also means that the literature on academic writing and AI, available at the time of our study, may not fully capture the most recent developments in this field.

In this paper, we first provide a description of the concurrent mixed methods design. We then present and discuss the findings related to students' use of AI to support learning. We give examples of how students use AI chatbots constructively in academic writing, characterizing their use through three subcategories: idea generation, sparring partner, and critical evaluation. We also provide examples of how students use AI chatbots as a “teaching assistant” to adapt and personalize learning. We conclude by presenting ethical concerns about the use of AI chatbots, both specifically in higher education and generally in life, before providing implications for policy, practice, and research. We have used Keenious in the writing process. Keenious is an AI tool that helps researchers and students find relevant research articles more efficiently[7].

## **2 METHODOLOGY**

### **2.1 Study design**

To gain insights into students' perceptions and use of AI-chatbots in the context of teaching and learning, our research employed a “partially mixed concurrent equal status design”, referring to a “study that has two phases that occur concurrently such that the quantitative and qualitative phases have approximately equal weight”[8]. This study design involved the simultaneous collection of both qualitative and quantitative data. The rationale behind adopting a concurrent design is the rapidly changing technology, and our intent to capture the nuanced experiences of students at a specific point in time. Our data collection involved a quantitative dimension through a survey and a qualitative aspect through open-ended questions embedded within the same survey. This allows us to explore students' experiences both in breadth and in depth.

By combining quantitative and qualitative research methods, we can not only capture the scope and variability of student experiences, but also delve into nuances in their perceptions and usage of AI-chatbots in teaching and learning.

## **2.2 Sample, procedure, and measures**

To investigate the students' attitudes, and use of artificial intelligence (AI) and AI chatbots to support teaching and learning in higher education, we conducted an anonymous survey with closed-ended and open-ended question. Some of the closed questions were adapted from a previous survey on student AI usage in Norway [9] the rest were designed by the authors. An example of a closed-ended question was: *To which degree do you have ethical concerns about the reliability of AI chatbots?* which was measured on a 5-point Likert scale from *A small degree (1)* to *A significant degree*. An example of an open-ended question was *How and where may AI chatbots best be used in higher education and/or in life, do you think?*

The survey was conducted digitally at one of the major university colleges in Norway and was available throughout September 2023, on the learning platform, info boards, campus posters, and on various social media. Using the SurveyXact program [10], 2822 students participated. The data collection followed the regulation of the General Data Protection Regulation (GDPR). The participants were informed of the purpose of the study, that their participation was voluntary, and that no personal, sensitive, nor identifiable data was collected.

## **2.3 Data analyses**

The quantitative data was analyzed using frequency analyses in SurveyXact [10] and to analyze the qualitative data, we used a descriptive content analysis [11]. Descriptive analysis is a systematic approach, which identifies and quantifies phenomena, experiences, and insights through codes, categories, and conceptual maps [11]. We used NVivo throughout to organize, systematize, and visualize the qualitative analysis.

# **3 RESULTS**

In this section, we present and discuss the findings of our study. We will concentrate on three dimensions from our main findings. First, we present and discuss the findings related to the students' use of AI chatbots to provide feedback on academic writing (3.1). Second, we focus on how the students use AI chatbots as adaptive learning tools and teaching assistants (3.2). Third, we examine the students' ethical concerns about the use of AI chatbots, both specifically in higher education and generally in life (3.3). In the discussion of the three dimensions, we will include the students' critical thoughts on the use of AI chatbots for the different purposes.

## **3.1 Use of AI- chatbots to provide Feedback on Academic Writing**

Overall, responses to open-ended questions reveal that students employ KI-chatbots as guides throughout their writing processes. This includes the initial stages of idea generation, problem formulation, outlining, and structuring, as well as feedback on form and content during the process, and language correction in the editing phase. The first

subcategory addresses idea generation and increases the number of perspectives. Several students use AI chatbots to get a "creative push" for ideas on what to write about and how to start their work. Students also highlight the opportunity to use AI chatbots to create suggestions for the overall structure and outline of texts or to generate formulations and draft paragraphs.

It encourages thinking differently, innovatively, and broadly, helping to initiate, offer structural tips, and enhance independent, yet creative thinking.

It serves as a valuable partner in brainstorming and the creative process.

In essence, the content is ultimately changed and written by me personally, but the "framework" and starting point can be provided by GPT. It is a useful tool to assist in structuring in the initial phase, as well as refining or condensing sentences and paragraphs in the final stages,

Students use AI chatbots for crucial parts of their writing process. It seems especially prevalent that students actively utilize the AI tool in the early stages of their work. However, many then use the text generated by the chatbot as a draft or a starting point for their own work rather than as a finished piece of text. The second subcategory revolves around using AI chatbots to provide feedback on text draft—acting as a writing guide or sparring partner. Examples are provided on how students prompt AI chatbots for input on their text, compare their own writing with text generated by the AI, and seek arguments and various perspectives for discussion.

I use AI to have someone to talk to and discuss texts, assignments, and paragraphs I, or others have written. It serves as a challenging perspective on my thoughts or helps me find more scholarly articles for my assignments.

I choose to consider suggestions regarding structure and theory that it provides, but always with a grain of salt. One should always be critical of what is provided, regardless of its source.

Our findings show that students receive guidance, explanations, and feedback in dialogue with an AI chatbot. In the study, we find, as in studies by [12] several descriptions of how the AI chatbot is actively used by students for feedback on writing. Students refer to the AI-chatbot as a "guide," "sparring partner," "someone to have conversations with," "student assistant," "assistant teacher," and "dialogue partner." In academic writing, students use AI chatbots for perspective expansion (getting ideas and advice on content) and reflections on perspectives (getting arguments and evaluations of content). In the expansion of the dialogical space [13], created between AI chatbots and students, different perspectives become visible, and students challenge assumptions and ideas. Students highlight that they receive valuable feedback on crucial parts of the writing process. Our study shows that students actively use feedback from AI chatbots. However, it's essential to note that the use of AI chatbot feedback in our data appears as an individual activity. At the same time, established research on assessment and feedback argues that feedback is a dialogic process involving multiple perspectives from students, peers, instructors, and other sources [14], and thus, the dialog between students, their peers and instructors is essential. In the third subcategory, we observe students using AI chatbots for proofreading and enhancing language. It is interesting to note that when AI chatbots are utilized to

support academic writing, many students mention learning more about academic writing.

When using AI, you eliminate a lot of the most tedious aspects of task writing, namely the writing itself, allowing you to focus on the creative processes and the overall picture of the task, which truly matters.

As I see it, AI frees up time to use my energy on what is most important, namely writing a text with good, accurate, and reflective content. It can help articulate your thoughts into text.

The accessibility of a tool assisting with grammar for everyone might lead to future assessments focusing more on content rather than the way it is written. Finally, in the third subcategory, students unanimously agree on the fundamental importance of critically evaluating what AI chatbots produce. The majority emphasizes that technology should not write on your behalf but should be used as a tool for thinking—a guide or sparring partner.

Students emphasize source criticism and critical thinking when interacting with AI-chatbots. The students' cautious approach to blindly trusting the quality of generated content is promising. The characterization of KI-chatbots as guides, sparring partners, or conversational aids is noteworthy. Interestingly, many use the AI chatbot as a discussion partner, indicating individual work, with no mention of peers, supervisors, or teachers, when using chatbots for academic writing.

### **3.2 Use of AI and chatbots to personalize and adapt learning**

Only to a small extent (9%) do students experience that AI chatbots are integrated into teaching. Instead, the students use AI chatbots as "teaching assistants" in their own learning processes, especially when it comes to understanding concepts, and content knowledge, for example by adapting simple explanations, receiving feedback on their own understanding (dialogue partner), and obtaining information. Students use ChatGPT to help them understand complex concepts by asking ChatGPT to explain things in their own way.

ChatGPT is good at using analogies to "dumb down" difficult topics. It can also ask and dig for an eternity without using the lecturer's time. Here, one must of course be critical of the answers one receives.

ChatGPT can interpret complex academic texts, explain technical terms and how they are used in practice, where you can use custom examples. It can ask follow-up questions that would not be possible as a passive reader of a text. It can easily confirm whether your academic understanding is correct or not.

It is a useful resource for learning, as it can explain things in a different way if one does not understand right away. It is timesaving in many ways, allowing students to focus on better understanding the whole of what they are learning.

Students use AI chatbots to understand and interpret knowledge in several ways. By translating and condensing text from articles, students can absorb the content in less time. Students are also preoccupied with the phenomenon of "dumbing down" or

simplifying texts, and that the chatbot can give better explanations than books and lecturers.

Students also use AI chatbots as a dialogue partner to receive feedback on their own understanding. They highlight that AI chatbots can be used for memorizing subject matter and testing themselves.

Chatbots are available 24/7, making them useful for students who have questions or need help outside of regular university office hours.

In cases where I have used Chat GTP, it has been to use it as a sparring partner if I get stuck. For example, I can write: What is meant by good classroom management.

I have also used ChatGPT as a kind of "student assistant" when working alone at school and, for example, do not understand what the English math book is really asking for in the assignment. Then you can also obtain resources that can help with understanding!

I use ChatGPT as a conversation partner to discuss questions I have in a study context.

Students appreciate that the chatbot is always available, unlike a teacher or study buddy. Then the AI tool can be used as a sparring partner, student assistant, or teaching assistant. The chatbot is used by several to check if the understandings they have of the subject matter are correct or good. Some also use the chatbot as a study buddy, using "flashcards", quizzes, or questions about subject matter. This form of interaction with technology can make learning processes easier and more motivating for students if the technology is used in good ways.

Students also use the AI chatbot to search for information, minimize time usage, and create summaries of articles or other resources.

To write summaries of existing text or rephrase sentences or similar.

Using it as an information hub, you could say, it finds good information that is otherwise difficult to obtain. Of course, I am not copying, but writing in my own words. I use it as SNL and other credible sources.

Overall, students' responses provide a clear picture that students use AI chatbots as learning partners and teaching assistants, especially for simpler explanations of complex topics to align with their pre-understanding. These findings are in line with recent research that shows that two of the most prominent roles of AI chatbots in higher education today are teaching assistants and learning partners[15]. Building a bridge between what we already know and what we are going to learn is important for learning to be internalized and meaningful[2, 3, 16]. In this sense, AI chatbots can serve as good learning tools in higher education.

While individual use of AI chatbots in learning provides opportunities, it also presents challenges. We know that learning is a social process, and that knowledge is constructed in interaction with other[3, 16, 17]. AI chatbots offer the possibility of adapting content to students' pre-understanding and knowledge levels and interest.



However, AI chatbots should rather complement fellow students as learning partners and instructors as teaching assistants.

The link between individual and collective learning processes is important to avoid individualizing learning processes for students. Teaching in higher education should therefore be designed in a way that provides students with a basis for constructing knowledge socially and in interaction with their fellow students and their lecturers in higher education. Social interaction between students is not only important for learning, but also for the feeling of belonging[18]. When students use each other as learning partners, they are invited into an academic community that can increase the sense of belonging. We live in a time when students report more loneliness than ever. According to the latest Student Health and Wellbeing Survey (SHOT) in Norway[19], 29% of students in higher education often or very often miss having someone to be with.

### 3.3 Ethical concerns

Our findings show that the students' ethical concerns regarding the use of AI chatbots may broadly reflect three different categories: I) concerns that are often discussed in relation to AI chatbots, in our material reflected in closed-ended questions about plagiarism or cheating, reliability, bias, privacy, and sustainability issues, II) concerns more related to the impact of AI chatbots on educational outcomes, such as learning and critical thinking, and III) concerns associated with the introduction of AI chatbots of a more universal nature, including inequality and injustice.

In the first category, the students' greatest ethical concern regarding the use of AI chatbots was related to plagiarism/cheating with 60% of the students (n=1519) reporting a fairly significant or significant degree of ethical concerns. The second most prominent ethical concern was AI chatbot reliability or rather lack thereof. In this case, 47% (n=1183) reported a fairly significant or significant degree of ethical concerns. 43% (n=1091) of the students stated that they experienced a fairly significant or significant degree of ethical concerns related to bias and 25% (n=632) reported a fairly significant or significant degree of ethical concerns related to privacy. 16% (n=405) experienced a fairly significant or significant degree of ethical problems associated with sustainability challenges, meaning that AI chatbots consume a significant amount of power and water, thus contributing to increased carbon emissions.

The two major concerns as measured in the closed-ended questions, i.e., plagiarism/cheating and reliability issues, were supported by and nuanced in the students' answers to the open-ended questions:

If something like this is to be used in education, I feel that proper training should be provided to ensure we use it correctly, instead of using it as a form of cheating.

When it comes to writing the actual assignment, it's probably best to do most of the work oneself. AI can provide a lot of incorrect information.

Further, in the second category students expressed concerns about the impact of AI chatbots on learning and critical thinking. These concerns were voiced in their answers to some of open-ended questions:

I think that as soon as chatbots are used to write texts or to complete entire assignments for you, it becomes problematic. In this case, the student is the one who loses out on the learning experience.

It must not be overused because it comes at the expense of human critical thinking.

The findings of both the first and second categories are in accordance with previous research from the US and a variety of Asian countries[20-26]. However, such findings have, to the best of our knowledge, not been documented in a large student population in Norway, or even Europe, before now. Our findings, combined with the findings in these previous studies indicate that a multitude of students' ethical concerns about AI chatbots, both in general and in higher education in particular, are similar across the globe.

Finally, in the third category the students reported concerns of a more universal nature:

I am afraid that some students may gain advantages by using AI while others may not even know what it is. This, in turn, can create a class distinction among students and injustice in the opportunities students have to achieve good results. If AI is to be used in studies, one should receive a certain introduction to it in the curriculum - if not, we should be clearly informed that AI is not allowed. In any case, it should be clear what is allowed and what is not allowed.

Even though I do not want to use AI directly in assignments, it concerns me to think that other students may have an advantage because they do. It almost becomes as if my moral barrier against using AI, as I perceive it as cheating, may hinder the progress of my work more than necessary (and in comparison to fellow students). Clear guidelines and good training will probably make it easier.

In these two student quotations we see how students worry about how the introduction and use of AI chatbots may facilitate inequality and injustice among the students. One of the fundamental goals of education is to give equal possibilities and opportunities to all and many measures are implemented to meet this goal[27]. As of now, appropriate measures to regulate AI chatbot use in higher education are not in place. Our findings show that the lack of common AI guidelines causes some student concern.

## **4 CONCLUSIONS**

Several studies on how technology impacts teaching and learning in higher education find that technology is often used to fit into conventional practices by reproducing or extending them, rather to challenge and change them[28, 29]. However, our study indicates that the use of AI chatbots is driven by students themselves and is not tied to traditional teacher-led practices.

Students express concerns about how AI chatbots may affect their learning, particularly in terms of critical thinking. They also have ethical concerns about the accuracy and reliability of AI chatbot responses. However, the majority are positive to AI and believe that AI chatbots have a natural place in higher education. While students



express concerns about the impact on critical thinking and ethical considerations, the majority acknowledges the potential benefits of AI chatbots in higher education. Students advocate for clear guidelines and fair assessment situations facilitated by educational institutions. It is crucial to consider international recommendations and local contexts when developing guidelines and fair assessment practices, ensuring that AI chatbots become valuable tools in higher education.

Use of AI chatbots in educational settings requires digital competence among educators as well as students. This competence involves a combination of technical, pedagogical, and didactic skills, as well as knowledge related to the content and methods of the subjects and ethical and responsible use. In addition, educators' digital competence is linked to developing students' digital competence. To enhance competence and contribute to the development of pedagogical practices related to the use of AI chatbots in teaching and learning, a research-oriented approach is recommended. This involves systematically developing and testing activities, investigating them using various methods, and sharing and discussing experiences within a collegial community[30].

Affordances of using AI to support teaching and learning in higher education, cannot be predetermined, but rather emerge within the specific context in which they are situated[31, 32]. Further research should investigate how AI chatbots support students in self-regulated learning and processes related to various types of feedback, both on product, content, form, and strategies. Additionally, one should explore the implications of using AI chatbots in the development of shorter or more extensive texts, and how this impacts the interaction between students and teachers/advisors in various educational settings. Methodologically, it could be crucial to examine how students use AI chatbots in practice, for example, through observation or screen recordings.

A timely question is how the role of educators must change now that many students use AI chatbots for feedback on significant portions of their text work. It is also interesting to examine the relationship between collective and individual use of AI tools. Some students use AI chatbots independently, while far fewer have used them in the classroom. Teaching in higher education should, because of AI, facilitate collective and social knowledge construction to promote deeper learning and critical thinking to a greater extent.

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