

The Impact of AI Models on Students' Writing Competence and Writing Motivation in The Context of Learning German as A Foreign Language in India

Payal Kumari

Doctoral Student, Jawaharlal Nehru University

Abstract:

The advent of Artificial Intelligence (AI) in education may encourage instructors to rethink their teaching methodologies. However, due to the rapid advances in technology, the involvement of digital agencies in education has increased manifold. This paper seeks to discuss the implications of such agencies for academic writing in German. Chat Generative Pre-trained Transformer (ChatGPT) is an artificial intelligence-generated text (AI-generated content) model that is based on artificial intelligence (AI). This paper uses a case study to explore the impact of ChatGPT on students' writing competence and writing motivation in the context of learning German as a foreign language in India. The results of this case study indicate that two factors become most challenging for Academic Writing in a Foreign Language (FL): "Limited Experience" and "Personal Writing Style". The findings of this study confirm the prevalence of cross-cultural rhetorical patterns and reinforce the importance of the setting of writing. The paper also analyses the role of manual human agencies in teaching as well as learning Academic Writing in foreign languages.

The process of writing is closely associated with the idea of education already in the school years. Learning as an experience is based on the interplay between the processes of Thinking and Writing, constituting a part of developmental psychology. The written language has its own psychological form. In the transition from speaking to writing, a child is introduced to the interactional nature of speech. The child also makes use of the associated resources in this process: Motivation, Usage, Understanding, and Success in action. The acquisition of written language promotes the *Ausbau* of Language Competence (Molitor-Lübbert, 2002, p. 39), something that we can also trace in the classroom settings that involve a foreign language and the syllabus designed around its acquisition/learning and usage. Academic writing has long been an integral part of learning and obtaining higher education in a particular subject. When it comes to learning a foreign language, learning to write scientifically not only equips students with deep subject knowledge but also improves their linguistic skills. In his article on the Significance of Teaching Academic Writing as a Discipline-Specific Skill, El-Sadig Ezza (2019) argues while quoting Hyland (2004, p. 5) that on a global level, researchers acknowledge writing as a subject-specific skill that “helps to create the discipline” by establishing disciplinary communities and determining what will count as disciplinary knowledge. (Hyland, 2004, p. 5) He goes on to support Hyland in his emphasis on the style of writing being the deciding factor and not the content for the differentiation of one disciplinary community from another. In

terms of the exchange of disciplinary knowledge pertaining to German Studies in India, this paper will henceforth mark and refer to the Germanistik students of Indian universities as a separate disciplinary community distinct from those pursuing their degree in Germanistik either in Germany itself or in countries other than India. The requirement to differentiate disciplinary communities from one another arises as some of the domains of DaF-learners have ample opportunities and resources to “interact with and learn about L2¹ speakers and their cultures in, for example, study-abroad experiences; others will not have had any dealings with them at all. This differential opportunity has a likely impact on learner proficiency and motivation (Writing in Foreign Language Contexts, 2009. p. XIV).”

My analysis would also revolve around the academic writing in the context of Indian students. When it comes to learning German as a foreign language, writing plays a big role in teaching the language in a wholesome manner. “It boots memorisation while consolidating lexical and grammatical knowledge, supports the process of speaking, reading, listening [one of the four *Sprachfertigkeiten*/Language Skills], as a means of controlling knowledge (Tulkunovna et al., 2021).”

Not only that, writing is “a repository of human knowledge and experience, as a mirror of each culture and tradition[...]. The purpose of teaching foreign writing is the formation of students’ communicative competence, which includes knowledge of written characters, spelling of words, vocabulary and grammar, composition of written texts, the ability to create various types of written communications; possession of the content and form of writing works of speech, ways to express thoughts in writing. The formation of a student’s professional readiness in learning a foreign language involves not only the development of professionally oriented activities (communicative), but also written [tasks]. Therefore, academic writing has to be a competent presentation of their thoughts in writing. It is a measure to elevate students’ self-confidence in the said language as well as remove the language barrier. It also stimulates further and more study of this subject (Tulkunovna et al., 2021).”

In their report on the effective strategies required for the improvement of writing skills in the English language, Cole and Feng (2015) claim that “writing is the skill which students find the most challenging and are least proficient in while acquiring a language” (p. 3). They have also advocated for the inclusion of courses in the curriculum that train students in writing. The Centre of German Studies at JNU has a course named “Writing Competence” that is extended over two semesters and designed to impart writing skills to students, equipping them with the necessary knowledge to form arguments, synthesise new ideas based on existing ones, and contribute to the world of academia via their individual takes on themes and topics. However, due to the rapid advances in technology, the involvement of digital agencies in education has increased manifold. This paper seeks to discuss the implications of such agencies for academic writing in German.

In the last couple of years, the domain of Artificial Intelligence has been worked on intensively, and one of the results of the progress in this field has been the introduction of “Chat Generative Pre-trained Transformer”, aka ChatGPT, which is OpenAI’s model. Its advanced, updated version was introduced on the market in November 2022, leading to its increased popularity. Recent advances in Natural Language Processing (NLP) technology have made it possible to automate many of the tasks in academic research, like sorting and analysing large volumes of text, which were previously performed manually by human agents. ChatGPT is a large language model that has been trained on an extensive corpus of text using algorithms, enabling it to generate text responses that are difficult to distinguish from human writing. The

¹ L2 in this case would be German, also being referred as FL at some portions of the text.

newer GPT models from 2019 on excel at various language and style tasks. (Dergaa et al., 2023, p. 616). Since the beginning of this academic year, there have been increasing cases of students at CGS, JNU using ChatGPT to create essays, write papers, and complete assignments. The concern about AI-generated content infiltrating scientific writing is growing. Even though we have different journal policies around the publication of content that have been recently updated to prohibit the use of AI-generated text, the issue of university students using AI to write their dissertations or papers that are a part of their degree courses' evaluation and not necessarily meant to be published is something that is yet to be discussed separately. The advent of AI in education may encourage instructors to rethink their teaching methodologies. The curricula may be revamped by including assignments that demand critical thinking and problem-solving beyond the actual capabilities of AI. That, however, cannot be a long-term solution as the software would continue to be updated and improved, and distinguishing between human and AI writing may become more difficult with time. Therefore, there could not be a law that would ensure no interference from AI in academic writing, as that will evolve into an endless race of AI with humans. (Dergaa et al., 2023, p. 616).

The only solution that my paper seeks to offer here today is to look at the advantages and importance of academic writing being a human's job and look for a balance where the institutions of higher education could envisage a holistic approach towards ChatGPT and similar models and ensure that their usage in the academic world is not outright curbed or discouraged. There could be a number of ways in which an ethical and sensible approach could be employed. (Dergaa et al., 2023, p. 616)

There are two dimensions through which we need to assess the dynamic between AI-generated content and human writing: One is the question of ethics, and the other is the authenticity of content. The increasing reliability of students in AI is due to the fact that they continue to place a high value on the credentials they earn in their postgraduate degrees. There are irrefutably several factors at play here; one could be due to the better-performing students getting an edge in job search in the markets; the second is the possibility of higher grades earning them a place at a university for higher degrees, should they wish to study further. Also, the factor of societal reputation being directly proportional to grades should not be left out here. However, only putting emphasis on the individual factor would not solve the question of ethics here. Determining and putting in place aspects of the ethical usage of ChatGPT calls for a collective effort, something that could lead AI to improve the educational landscape of a language. To begin with, using ChatGPT to generate content and turning it in as their own piece of writing shall itself be plagiarism, and it is an unethical or dishonest use of technology as the content produced is not their own. This leads us to the fact that academic writing is something that has "Uniqueness" as its major component, pertaining to every individual producing their research and content. My paper seeks to bring the factor of "Uniqueness" under the purview of ethics in foreign language writing, where this uniqueness is a display of the individual approach towards the German language and related aspects.

Every academic paper is based on an architecture that includes both objective (following a pattern, sticking to methodology, literature review, providing evidence for arguments, etc.) and subjective elements that, when combined with the objective ones, help the students reach a certain conclusion.

Using Mikhail Bakhtin's theory that speech genres are inherent to us the same way our native language is, and language forms as well as typical speech acts become part of our mind and experience (Bakhtin, 1996), Diane Schmitt suggests that every student has their own writing style, something that is developed while they familiarise themselves with scientific texts in their native language. (Schmitt 2005, p. 87)

In his article “Writing a Research Paper in the Foreign Languages,” Nazmiye Gürel Cennetkusu undertakes a case study of academic writing in Turkey and the USA and points out the cultural dimensions that define the academic circles of these two countries, exerting an influence on the writing style of students. The results of this case study indicate that two factors become most challenging for academic writing in a FL: “Limited Experience” and “Personal Writing Style”. The process of "dialogue" is something that has the potential to ease the burden of writing for students. By bringing the capacity of AI into this equation, we might get positive results in eradicating the hindrances the students face while writing a dissertation in FL. An AI software is constantly fed with algorithms, causing it to become all-knowing and therefore bring plenty of data for the paper it writes. However, the word experience is something that does not limit itself to the mere domain of data; it has a pure anthropomorphic touch, and only a human would analyse and assess a particular phenomenon based on their experience. In her book “Contrastive Rhetoric: Cross-Cultural Aspects of Second Language Writing”, Ulla Connor talks about a study that compared U.S. and Japanese students’ use of general statements in essays. Comparisons were made between the writing samples of many groups of students, among whom there were Japanese advanced ESL students in the U.S. and English-majoring Japanese students in Japan. Both these groups wrote in English; however, in their writing, Japanese students studying in the U.S. placed the general statement at the beginning, and the Japanese students in Japan placed the general statements at the end. This study and its results confirmed the prevalence of cross-cultural rhetorical patterns and reinforced the importance of the setting of writing. For this phenomenon to appear in the process of dissertation writing by Indian students of German studies, anthropomorphic agency is required, as ChatGPT, being a software, would use the same textual style in every academic setting. (Connor, 1996, p. 43)

In their article on scientific writing, Konrad Ehrlich and Angelika Steets (2012) talk about the question of linguistic qualifications within German language learning. These qualifications also encompass the steps of academic writing like “*Problemerörterung* (problem discussion)” and text analysis on the one hand and “*emanzipatorischer Kommunikationsbefähigung* (emancipatory communication competence)” on the other. All these prerequisites that a student has to fulfil before writing a paper start with identifying a problem within the existing research. Departing from this point, even if two or more individuals, coincidentally or not, work on the same theme, the possibility of both of them identifying the same research problem within that would be low. This phenomenon not only stems from the depth of individual knowledge of a topic but also from the existing biases (sometimes affected by gender, class, culture, geographical location, etc.) that shape their perspectives towards that theme, not to leave out the language competence that varies in degree from person to person. Choosing AI models to identify a research problem and analyse primary texts diminishes the quality of academic research in the sense that it leaves no space for the individual perspectives or their “*Vorurteile*” to get imbibed in the text. These perspectives contribute to the enrichment of a theme area and add other dimensions, pointing out that research and writing are complex processes requiring human agency and are not limited to mining the same knowledge using algorithms. It is safe to make the statement that although ChatGPT and similar models have the capability to remove writer’s block, they are equally capable of removing the writer herself from the text.

According to Qadir (2022), ChatGPT and other generative AI systems are capable of perpetuating biases or even generating and propagating false information. Both of these possibilities pose a danger to the field of academic writing in German and are extremely harmful to the students who place their whole bet on

ChatGPT. This paper seeks to discuss the second possibility using an example of the plot elements of Erich Kästner's 1931 novel, Fabian. In the following section, a comparison is made between the text passage generated by ChatGPT and the text passage written by me, the researcher, on the same topic. The prompts used, the passages generated by ChatGPT, and my writing were originally in German. Their English translations are being provided here. The topic here, which was also used as the prompt in ChatGPT, is "Analysis of Women Characters" in Fabian. The information in the text generated by ChatGPT is sufficiently wrong and is not bridgeable with the original novel plot at all.

<p>(The comparison table could only fit on the next two pages:)Text generated by ChatGPT</p> <p>In Erich Kästner's novel "Fabian. The Story of a Moral Sceptic" (1931), women play an important role. The novel tells the story of young Fabian, a moral sceptic who lives in Berlin in the 1920s and has experiences with various women.</p> <p>One of the most important female characters is Lulu, a young woman Fabian meets at the beginning of the novel. She is independent and self-confident and wants to lead her own life instead of submitting to her family's expectations. She is also a representative of the "New Woman," and her relationship with Fabian shows both the freedoms and the difficulties that this new kind of woman had in society.</p> <p>Another important female character is Tini, Fabian's fiancée, who shows him that traditional role models and expectations of women still exist and that it is often difficult to resist them.</p> <p>In general, the novel shows how women in the Weimar Republic were torn between traditional and modern role models and how difficult it was to rebel against societal expectations. It also shows the struggles and challenges that the new women had during this time.</p>	<p>Self-composed text</p> <p>In Erich Kästner's novel Fabian, the Story of a Moral Sceptic", published in 1931, the female characters make up an integral part of the city dynamic, which is decisively reflected in the lives of all the novel's characters. This novel is about 30-year-old Jakob Fabian, who throughout the novel views everything with such a perspective as if he has suddenly appeared in Berlin. Occasionally, he seems to have a hard time accepting phenomena that have become part of modern city trends.</p> <p>His first encounter is shown with Mrs Irene Moll, who, after a brief but intense interaction in an establishment, takes him to her place, where he meets her husband, who explains to him that the Molls have a contract according to which Mrs Moll could create relationships with other men. The portrayal of Fabian's interaction with Irene's character figure demonstrates Fabian's shocked engagement with the trends of the modern metropolis and society.</p> <p>The second main female character is Cornelia, who is Fabian's girlfriend but later leaves him for her film director because the latter has promised her a role in a film. Fabian's short-lived relationship with Cornelia symbolises the instability of city life, which could not assure anyone of everlasting happiness in the narrated time period.</p> <p>A crucial role in the dynamics of Fabian's life is also played by his mother, whose name is not mentioned anywhere in the novel, as if it is just her motherly role and love for Fabian that are worthy of illumination in this story. She represents the</p>
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	<p>obedient and traditional image of the mother that dates back to the imperial era and whose harmony could also be found in Kästner's own life. She is mentioned at one point as "Müttchen".</p> <p>The portrayal of women's characters in Fabian aimed at portraying a dichotomy, an overwhelming stereotype, which at the time contrasted with the rise of the "new woman". This led to a (rather negative) categorisation of women as either traditional or modern, which also resonated in various forms in popular culture.</p>
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ChatGPT generated a response containing factual errors and misrepresentations, which could be attributed to the absence of relevant articles in its training set and/or the inability to differentiate between credible and less credible sources. (Derga et al., 2023, p. 161)

The failure of ChatGPT displayed here with the example of the plot analysis above calls for a discussion on the topic of authenticity in academic writing. Scientific writing requires a thorough understanding of complex concepts, theories, and experiments conducted in the given field of study. Before the students sign up for dissertation writing, they are made familiar with different theories in the disciplines of German. While writing their papers, they are expected to employ those theories by using arguments and making connections between novel plots or phenomena in the chosen theme area. ChatGPT, on the other hand, relies on algorithms and pre-existing data sets to generate responses, which can be inadequate when it comes to producing scientific papers. It cannot cite text passages to back up a certain argument in the paper, nor can it make use of intertextuality without being provided with a prompt for the same. On the other hand, a student writing their analysis of a novel based on Berlin in the 1920s might consider comparing the setting of the city in this period with that of the Wilhemian era using the plot of another novel they have read. This is something that AI is not yet capable of doing.

Another factor that comes into play here is AI's ability to "offer suggestions on grammar, punctuation, and sentence structure[...]", something that could tempt students to improve their dissertations using software like Quillbot that has multiple language settings. However, it would be a source of issues not only related to ethics and measuring and evaluating students' individual potential but also reveal the effect of economic disparity in the academic world, as the usage of many of these software requires a premium subscription, something that a number of students at public universities, where students' education has to be subsidised, would not be able to afford. This could increase the already-existing economic disparities in academic settings. "[...] It is likely that high-income countries and privileged researchers will quickly find ways to exploit LLMs² in ways that accelerate their research and widen inequalities even more

² Large Language Model (LLM) is a type of artificial intelligence (AI) algorithm that uses deep learning techniques and massively large data sets to understand, summarize, generate and predict new content. Kerner (2023). URL: [https://www.techtarget.com/whatis/definition/large-language-model-LLM#:~:text=A%20large%20language%20model%20\(LLM\)%20is%20a%20type%20of%20artificial,generate%20and%20predict%20new%20content](https://www.techtarget.com/whatis/definition/large-language-model-LLM#:~:text=A%20large%20language%20model%20(LLM)%20is%20a%20type%20of%20artificial,generate%20and%20predict%20new%20content). Accessed on 02/09/2023.

(Mhlanga, 2023). Looking at the repercussions of the same on German studies in Indian academic settings, this is something that would lead to the students falling behind the German learners from developed countries on international platforms.

The fast development of communication technologies has given language learning a new platform. The AI, as much as it is capable of opening new dimensions to the classroom and individual learning of foreign languages, also requires linguistic experts for all phases of learning for its constant quality and authenticity assessment. More in-depth research is required in the areas where AI is or would affect learning in academia. This research, as Momcilovic and Petrovich (2016, 138) argue, would transcend the area of theories into the practical applications of learning, to which we also add academic writing. Academic writing in schools or colleges is a phenomenon that occurs as a skill that requires the presence of the “Inner Language”. This “Inner Language” (without delving into the debate of rationalism and empiricism) is a quality that can be attributed to the consciousness of human beings.

Academic writing (especially when it takes the form of a master's thesis or term paper) should be recognised as a performance. Taking only the example of term papers, they are the test (method of measurement) of competencies that students (writers) should have conquered in the course of a given seminar. In their article on documenting competencies in a postgraduate Master's programme, Olaf-Zawacki-Richter, Eva Maria Bäcker, and Anke Hanft (2010) use Weinert's definition of competencies for this discussion. Based on the definition of this term given in this article, competencies in the case of students who have to do academic work come as either "cognitive abilities and skills already available to them or potentially conquerable in order to solve certain problems" (Zawacki-Richter et al.) and, in connection with this, "the associated motivational [...] and social readiness and skills to be able to implement the problem solutions successfully and responsibly in variable situations" (Ibd.). Since the conquest of competencies and the motivation to apply these competencies are linked here, one could also see the reflection of this motivation in the willingness of individual students to complete written tasks such as seminar papers or master's theses. It is easy to emphasise that this motivation could determine the quality and authenticity of their academic writing. It is precisely this motivation that is needed when taking the first step in academic writing, the selection of topics, where expertise, i.e., what students have gathered or increased in the course of their courses, plays the main role.

Assessment of subject knowledge becomes particularly important when one has a foreign language as a major in an academic setting like India. The texts covered in a foreign language class are discussed or interpreted depending on the culture of the target audience. (Elisabeth and Carmen, 2013, 5) In such circumstances, when students are assigned the task of writing a paper, they are expected to have (if they attend classes regularly) a certain level of knowledge about the culture of the foreign country. They can also add to their existing knowledge through relevant research. There are two aspects to focus on here where AI models like ChatGPT might seem weaker than human research skills (if they were to be used to produce a scientific text). The first aspect is the data dependency of ChatGPT. Before being released to the public free of charge, software like ChatGPT goes through a process of "data training"³ (Max, 2023). So there would certainly be a number of topics that would either be deliberately disregarded in this training or could not be used because of any limitations. In such cases, ChatGPT could either produce no written

³ ChatGPT für wissenschaftliche Arbeiten: Kann KI wissenschaftliche Texte verfassen und Quellenangaben erstellen? von [Scientific Economics - ChatGPT, KI, OpenAI & Co.](https://www.scientific-economics.com/chatgpt-ki-openai-co/) | Mai 23, 2023 | [Chat GPT, KI & Co.](https://www.scientific-economics.com/chatgpt-ki-co/) URL: <https://www.scientific-economics.com/chatgpt-wissenschaftliche-arbeit-texte-artikel-schreiben/>. Accessed on: 01/09/2023

material for a paper or produce incomplete information about a theme. Furthermore, “language models like ChatGPT can propagate and magnify [existing] preconceptions, biases, and prejudices. This is a risk that comes with using these models. When employed in educational contexts, ChatGPT may provide responses that are prejudiced and discriminatory, for instance, if the training data that was used to train it had unfavourable prejudices about particular groups. (Mhlanga, 2023) These existing biases can pose problems for research in the humanities (especially foreign language literature courses), where students have to analyse literary works and/or their characters in the light of the researched time period or epochs. When it comes to dealing with questions of gender, sexuality, class, economic differences, or race, ChatGPT would not approach a topic with the same attitude that a human belonging to a certain community would, as the former does not possess emotional intelligence. This phenomenon might not have favourable implications for the study of the culture and language of a particular country (in this case, Germany) in a foreign academic setting (like India’s).

The need to effectively communicate and disseminate information via a scientific piece of writing (especially considering a particular cultural circle of audience) is something that only a human being with a close understanding of that circle can achieve. This is where one of the serious limitations of ChatGPT comes into play. It lacks a human researcher’s depth of knowledge and expertise.

There are, however, a number of ways in which ChatGPT, Quillbot, or similar models can “aid” in academic writing:

1. Once a student has already finished writing a text, models like Quillbot can check the text for grammatical corrections and improved conciseness. They can arrange the arguments using the correct format as well as identify issues with referencing and sources. However, this all should also be done with the prior permission of the concerned course instructor or guide, as proofreading and corrections can also be done by the teachers evaluating the papers to provide proper feedback to students based on their language competence.
2. Another manner in which ChatGPT can aid the research process is by generating summaries of scientific articles, as they are “lengthy and technical,” and students might have to devote a considerable amount of time scouring through piles of them just to find the portions relevant to their research. However, relying on a digital agency to summarise secondary texts might not be as effective as a thorough manual reading can be. At times, there are quotes and terms that could be taken directly from an article and used in one’s own text, building a direct bridge between an existing piece of research and one’s own content. AI, generating only summaries of the articles, would not exactly be equipped to do that.
3. After the students have finished writing the main content of their paper, ChatGPT can generate a clear and concise introduction that would help with addressing the target audience, making them comprehend the central motives of the research and its relevance for them.
4. ChatGPT can help students brainstorm ideas for a research topic. “Students can share the ideas they already have with ChatGPT, and in return, the chatbot can suggest ideas for further exploration and even organisation of their points (Robinson, 2023)”. This would help narrow down a topic to a certain aspect of space and time. However, there are a whole series of steps that follow after one picks up a theme to work on, including a literature review and formulating a research question. Finding adequate secondary material on the topic chosen is not always convenient, and therefore, interest in a particular topic should not be the only criterion for writing a paper on it. The availability of books and articles on the topic, existing knowledge, connection with the syllabus taught, and the expertise of the teachers

willing to supervise the paper writing are some of the other factors that should be taken into consideration while choosing a research theme. Therefore, it should be the students themselves who select the topics, not only ChatGPT.

The fast development of communication technologies has given language learning a new platform. The AI, as much as it is capable of opening new dimensions to the classroom and individual learning of foreign languages, also requires linguistic experts for all phases of learning for its constant quality and authenticity assessment. More in-depth research is required in the areas where AI is or would affect learning in academia. This research, as Momcilovic and Petrovich (2016, 138) argue, would transcend the area of theories into the practical applications of learning, to which we also add academic writing. To maintain harmony between AI models and authentic human research, it is recommended that all the stakeholders of academic institutions, i.e., researchers and teachers, try out ChatGPT for themselves and find out the different patterns associated with the functioning of this software. Additionally, discussions around the usage of ChatGPT and other AI models should be made a part of the orientation sessions in the departments in order to determine how ChatGPT could be used with “honesty, integrity, and transparency (Dergaa et al., 2023, p. 616).” “Students writing their papers must be reminded that they will be held accountable for their work, whether it was generated with the support of ChatGPT or equivalent support or not. Therefore, [they] should take responsibility for thoroughly fact-checking their text, results, data, [...] and references (Dergaa et al., 2023, p. 616).”

A survey was conducted to collect the viewpoints of the students of the Centre of German Studies at Jawaharlal Nehru University (New Delhi) on the usage of the AI-writing model in dissertation writing. The participants are students who have finished writing their MA dissertations. Out of the six students who took the survey, four admitted to using ChatGPT for dissertation writing. While one of them used it to obtain an easier understanding of their research sub-topics, another used it for translation. All of them had varied responses to the question of whether AI has the capability of helping them overcome the challenges they face with academic writing in German studies. While some of them agreed that AI models are capable of assisting students, the majority of the participants rejected this idea.

As Singh (2022) adequately puts it, what separates AI from humans is “agency,” and we should strive to exercise agency in every activity we seek AI support for.

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