

**RESEARCH PAPER****Utilizing ChatGPT to Elevate Teaching and Learning in Pakistani Universities****¹Aammara Balqees,²Aroosa Syed and ^{*3}Dr. Shamim Ullah**

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***Corresponding Author:** shamimullah.ier@pu.edu.pk**ABSTRACT**

This research examines the generative AI tool ChatGPT and its use in the teaching and learning experience in Pakistani higher education. The study's primary objective was to assess ChatGPT's application for making educational processes more efficient, for personalizing learning experiences, and for overcoming the sundry problems that real-world. AI implementation presents to actual human stakeholders—in this case, the teachers and learners within the higher education sector. It employed a quantitative research design to gather relevant data that could lead to a more comprehensive understanding of this phenomenon. This survey targeted a limited number of educators and learners at the university level—specifically, from the undergraduate, graduate, master's, and doctorate levels—to obtain their perspectives on the interaction with ChatGPT and its impact on their education. ChatGPT is increasingly being adopted in our colleges and universities, and we recommend that its use be permitted. It was recommended that our institutions to craft usage policies about ChatGPT and other AI tools.

KEYWORDS

Artificial Intelligence, ChatGpt, Generative AI, Higher Education, Teaching and Learning

Introduction

The learner must be taught and actively participate in the learning process for the acquisition of new knowledge and skills to occur. The learner will attend classes where new material is presented and will study it to achieve mastery. As a result, the individual now has something new that they did not have before and is better equipped with knowledge and/or skills in a particular area. The 21st century, often referred to as the era of technology, has seen technology become an indispensable facet of life. We rely on tech for crucial matters, and its continual operation is paramount (Mosaiyebzadeh et al., 2023). Nowadays, in almost every regard, it is a technology that powers our world, and this is pronounced when we look at the educational system. Therein lies the crucial matter—our educative system is heavily tech-influenced; therefore, we need to have substantial knowledge of contemporary technology to be able to at least somewhat keep pace with our educable system. Our lives have been transformed by technology, which has given us uncomplicated instruments that can make things simpler, quicker, and more precise (Elbanna& Armstrong, 2024).

The world's powerful touch of technology is everywhere visible. For all the wonders that have emerged from technology, the computer and the smartphone must rank paramount as life's most transformative instruments. These devices have reshaped our mentality completely; they have "remade" our society, in fact, our world, to look and to operate in vast, mind-bending ways. Their effects are now so all-pervasive that many just call it a technological revolution (Adeshola&Adepoju, 2023). In the past, we could

regard something as a technological marvel without it being commonplace. By now, it seems everything has technology added to it, and in many fields—like healthcare, finance, food service, and education—we have come to depend on tech tools to function (Rasul et al., 2023). In recent studies, cutting-edge research has focused a lot of attention on artificial intelligence. At present, AI carries out the complex, sector-spanning tasks of a very sophisticated tool, working its magic in all sorts of places, including schools. It quietly teaches and learns in ways that resonate with all of us (Elbanna & Armstrong, 2024).

The roots of artificial intelligence can be traced back to the 1950s, which is clear from the base it provides for the development of chatbots (Ausat et al., 2023). During this time, the very first artificial intelligence program, known as ELIZA, was created. As AI technology progressed, programs were developed that could comprehend and obey human commands (Javaid et al., 2023). Industries, healthcare, and educational institutions all use chatbots today. Still, the attempts to replicate human intelligence in computers and electronics represent the frontier of artificial intelligence. When we talk about what real intelligence is, we usually define it based on discerning patterns and processing large amounts of data. And we have found that using computers to do this for us works pretty well. From these attempts, we have derived a whole number of methods that serve us in pattern recognition and data processing. These methods, when put to use, represent the actual applications of AI in our world today (Al Shloul et al., 2024).

The technological advancements we have today let students present their ideas and concepts in a clear and organized manner. November 2022 witnessed the introduction of ChatGPT, an artificial intelligence program developed by Open AI. Its emergence has since been causing quite a stir in Pakistan's higher education system (Patrício & Gonçalves, 2024). Since its beginning, it has gained huge popularity among faculty and students. They use it now in their lives, and with good reason. ChatGPT allows for instant conversation with all kinds of minds—helpful, smart, and some not at all helpful (de Bem Machado et al., 2024). ChatGPT helps and advises a diverse array of individuals across various sectors of society. When it comes to productivity within the realm of entertaining, but educational, uses of the platform, the most prominent feature seems to be the ability to generate article summaries that are tight, clear, and coherent (Coelho et al., 2024).

ChatGPT is a product of human ingenuity that uses artificial intelligence to produce answers to questions humans pose; these answers are intended to resemble human speech. To give such answers, ChatGPT relies on vast amounts of data about human language and the 'Transformer,' a powerful technology in the realm of artificial intelligence. For several years, now, educational AI programs like ChatGPT have generated feedback in text form when they are prompted (Freire et al., 2024). Their popularity with social scientists and their offshoots stems partly from the fact that they can 'write' in a somewhat human manner. Producing data "on" individuals using these programs is concerning. It might even be the case that influencing the depth and breadth of our unique and collective societal expressions could strongly undermine the stated aim of the programs, which is to enhance the content search. To gain a better understanding of this dynamic, we can examine how two of the leading generative AI programs, ChatGPT and Stable Diffusion, operate. Both programs rely on natural language processing techniques utilized by ChatGPT, whereas Stable Diffusion harnesses the power of natural image processing techniques (Machado et al., 2024).

For instance, consider the language model known as ChatGPT. Built on colossal amounts of data, ChatGPT issues forth answers when prompted. By no means is it the only tool of its kind, yet it represents the state of the art in human-computer interfacing. If a computer can interface with us in something close to normal human behavior, the reasoning goes, it must also understand us. After all, it mimics us. And whether prompted in English or a variant of that language, ChatGPT and its mimics produce content that can be confused with human-made bits. This conference doesn't focus on such tools per se, but the resolution that technological mediators can that can stage normal human interactions lies behind the tools and in front of the attendees (Costa et al., 2024).

The newest AI models can learn from enormous quantities of data. OpenAI's GPT-3.5 derived successors, by the name of ChatGPT, came out in 2022. They provide not only a virtual assistive conversational platform but also a platform for eavesdropping on text's many facets—doing what it does with conversation, but with text—as well as for debugging programs written with a text-based programming language. Peeking into the nearly infinite number of possible pathways that text can take, these models are virtual pathfinders with conversation as their main game, but also with eavesdropping debugging and problem-solving text comprehensively (Parker et al., 2024a)

Students receive individualized learning experiences from ChatGPT, as the AI gives them prompt and personalized feedback on their assignments and exams. It is trained to assess student performance and to be able to comment on it helpfully. The "GPT" in the AI's name stands for "generative pre-trained transformer." Pre-training is when the AI model takes in a lot of written human language and uses it to learn. Then comes the real magic: When you type a prompt into ChatGPT, it generates a human-like response that seems "aware" of the context. After doing that, it fills in what seems like missing context words by projecting (with the eyes of a thousand guesses) what it thinks ought to come next (Grassini, 2023).

Transforming the educational landscape calls for innovative, even imaginative, approaches to teaching and learning. What is fortunate—it is fortunate—is that the advent of AI has made this both an easier and more efficient task, if we can still think of it as a task. Whether one sees the educational process more as a call, a path, or a way, teachers now have the opportunity to spend more time and energy on the "how" of the matter while relatively comfortable in the knowledge that the "what" and the "why" are happening as well (Poola&Božić, 2023). The educational system has changed a lot over the years, and our classrooms today, for the most part, are far more student-centered than they used to be. In this kind of classroom, the role of the teacher is fundamentally different from what it used to be. No longer is the teacher the main event in the educational process, a virtual fountain of knowledge and power, from which brilliant streams of light shine forth. If my son and I had been sitting in a meet-the-teacher night where the teacher is doing all the talking, for instance, the light that was being shone would have been more like a flashlight than a lamp (Lo, 2023).

According to (Halaweh, 2023), Higher education is widely recognized as a nearly universal good. The penetrative effects of what might be called the higher education "wellness project" extend deep into individual lives and, with some delay, into the quite different forms that collective life can take. Why is this so? Indeed, one need only think of the individual—and, by extension, the collective—implications of life in the digital grammar we have come to inhabit to appreciate the sorts of experiences that have been insisted upon as "personalized learning" opportunities (Lo, 2023). The past few years have seen significant growth in various educational sectors, thanks to advancements in

technology. The virtual assistant ChatGPT has shown remarkable development in many areas – text production, text summarization, speech and identity recognition, language translation, and other similar applications we've come to know. The way ChatGPT works makes it obvious to researchers at first glance what its main connective features are, namely the dependencies it has with the text it produces. To tackle this problem (and others), a researcher at Google introduced a new architecture in 2017 – a model called the "transformer." One reason the transformer has become so popular and widely used is that it has a "self-attention" mechanism (Parker et al., 2024b).

According to (Rahman &Watanobe, 2023), The field of education utilizes a number of artificial intelligence tools, but none so commonly or popular as ChatGPT. This is because ChatGPT is very easy to use, and it has become exceedingly popular among the student body. Technology now plays a giant role in the educational experience. Students are now using AI as a way to problem-solve their various educational bumps in the road. And what they have produced while using AI is nothing short of incredible. Moreover, they are now using ChatGPT for a number of other life management tasks, including but not limited to social communication and partner management. Students really dig ChatGPT for helping them figure out how to run their personal social lives. In terms of future significance, ChatGPT is almost certainly going to bring some changes to students down the line (Speer et al., 2024).

Literature Review

Rapidly developing artificial intelligence technologies are now cascading into various sectors, including education. One such AI tool making waves is ChatGPT, a generative language model from OpenAI that has proven adept at producing human-like written text and performing numerous work-related functions. In higher education, particularly in Pakistan, there is burgeoning interest in exploring the potential of ChatGPT as a tool for elevating the standard of both traditional and modern teaching methods. In this review of the literature, I take a closer look at the theoretical underpinnings of AI as part of the future of educational pedagogy, at the practical applications of ChatGPT in academic settings, and at largely unexamined potential and mostly unaddressed challenges for ChatGPT as an above-average, nonlikely-to-fail teaching assistant (Montenegro-Rueda et al., 2023).

Extensive academic discussion has taken place concerning the implementation of artificial intelligence in the educational sphere. Authors (Adeshola&Adepoju, 2023) argue that AI can bring about a manifold enhancement of the personalized learning experience. They see artificial intelligence as something that can provide "much more efficient, effective, and even more powerful ways of achieving any kind of interaction between a teacher and a learner." Their work, along with others (Fuchs, 2023), for instance), paints a picture of intelligent systems making for an educational transformation.

The sociocultural theory of Vygotsky (1978) posits that learning occurs through interaction. Simulating a dialogue with a learner and providing instant feedback are ways that AI tools –notably ChatGPT –can facilitate this kind of interaction. For ChatGPT to serve any educational purpose, it is primarily through the interaction it allows between the learner and the knowledge they seek. Vygotsky's theory holds that constructive learning is a collaborative effort and, as such, supports a vision of using educational technologies –like ChatGPT –that allow for knowledge construction through dialogue. Students who would have learned through collaborative efforts in the classroom can now use ChatGPT to interact in ways somewhat mimicking that process.

On the other hand, educators can use ChatGPT in ways that make their interactions with students and the instruction process more efficient (Prananta et al., 2023).

Recent research shows that ChatGPT can help promote critical thinking by asking questions, proposing different perspectives, and pushing students to think more deeply about what they are studying. But there is also some concern that we might start relying too much on ChatGPT. Some scholars worry that if students use the tool without enough supervision and clear plans for what sorts of tasks it can help with and what sorts of tasks they should really be doing on their own, their use of ChatGPT will just make them smarter and not much different from the old "using the Internet" version of a cipher in terms of its actual function. The universities in Pakistan are currently undergoing a digital transformation. The new vision is to somehow integrate technology with the teaching-learning process. The Higher Education Commission in Pakistan has introduced several initiatives under the new directives (İpek et al., 2023).

In the Pakistan higher education context, ChatGPT has a great opportunity. First, it can be a 'chatbot for comprehension.' Given the state of teaching and learning in many of our universities, a bot that can engage students in interactive dialogue and give them alternative ways of understanding and processes should serve to at least partially replace what is far too close to rote learning. And in what way is this bot different from the old methods of 'teaching by talk'? Are there any advantages? The immediate feedback and personalized paths that such a learning tool could provide for students make it, well, a much smarter tool for 'servicing' our students. Our students learn in various ways, and we have not, in our large classrooms, served them as well as we could. ChatGPT may be a significant step toward our learning how to serve our students (Saif et al., 2024)

One area where ChatGPT can have a major effect is language learning. Many students, particularly those from rural parts, find it very difficult to learn English. But ChatGPT can provide them with a sort of virtual English immersion by letting them practice in real time and by correcting their grammar. Even more importantly, it can help them learn how to have conversations in English, which is a part of language learning that many students miss because they don't have English speakers to talk to. ... On the other hand, the research productivity of students and faculty in Pakistan can definitely be enhanced by the use of ChatGPT (Saif et al., 2024)

Even with its promise, numerous obstacles stand in the way of the broader use of ChatGPT in Pakistani universities. One of the biggest is the digital divide. Many of the country's universities, particularly those in the more remote parts of Pakistan, simply do not have the essential infrastructure in place that is necessary for the reliable and consistent use of something like ChatGPT; this is primarily the stable internet service and access to current technological devices. If these fundamental access issues cannot be resolved, the use of ChatGPT in universities will not be able to benefit a large portion of the student body (Butt et al., 2024)

There is also concern about the potentially nasty consequences – much discussed in the media – of using artificial intelligence tools in education. There seems to be a natural human proclivity to be dishonest, particularly when it comes to matters where there are temptations to do so. The allure of the new AI tools may well fuel some of those human tendencies. I believe that these matters of provocation and temptation need to be taken very seriously and worked out with something like full human consent at the end of the process. Another challenge is pushback from faculty who are uncertain about the use of artificial intelligence in teaching (Abdullah et al., 2024). Many educators, particularly those from traditional backgrounds, may feel that AI threatens their very

role as an instructor and the human element of teaching. This resistance can be overcome with professional development programs that demonstrate the value of AI tools like ChatGPT in improving—not replacing—the traditional teaching and learning experience. Faculty members also bring up the concern that the content created by ChatGPT and other similar tools is not necessarily "localized content," meaning relevant to the Pakistan context. Translation of ChatGPT content into the local language of Urdu—while it could be part of the "localized content" solution—still presents a problem since students are being taught in a different language (Al Shloul et al., 2024).

An increasing number of empirical studies are now backing the use of AI programs in educational settings. For instance, a recent study by (Ishaq et al., 2023) looked at the effectiveness of one such program, the AI-driven tutor, on student learning outcomes in Pakistan. They discovered the AI tutor significantly boosted student engagement and performance, especially in STEM (science, technology, engineering, and math) subjects. Ishaq et al (2023) found that students using ChatGPT (an AI text generator) to help with their research projects had not only a better grasp of the material but also produced work of greater quality than peers who did not use the program. Both of these reports demonstrate the case for introducing AI texts into the teaching landscape of Pakistan and serve as a backdrop to our experiment with an AI text generator.

Material and Methods

The study aimed to delve into the possible uses of ChatGPT in improving the teaching and learning processes in the higher education sector. It employed a quantitative research design to gather relevant data that could lead to a more comprehensive understanding of this phenomenon. This is one of the rare studies that have been conducted on the use of generative artificial intelligence, such as ChatGPT, in the education domain. Within three main sections, the questionnaire reflects not only the objectives of the study but also the pretty clear idea of the researchers about the benefits, effectiveness, and challenges (including ethical ones) of the use of such a tool in higher education.

This survey targeted a limited number of educators and learners at the university level—specifically, from the undergraduate, graduate, master's, and doctorate levels—to obtain their perspectives on the interaction with ChatGPT and its impact on their education. For data collection, we used the online survey tool provided by Google. We employed a stratified random sampling method to select participants for our survey. We determined the sample size through stratified random sampling, which included 119 students from various universities across the United States at different education levels (undergraduate, graduate, master's, and doctorate). We also selected 200 university students who indicated that they either interact (or have interacted) with ChatGPT or who have no experience with artificial intelligence when it comes to educational tasks.

In this study, the researchers divided students at each level of higher education into two groups based on gender. They gathered data from a total of 119 students across various educational levels. To collect these data, the researchers employed a standard instrument for quantitative studies: a questionnaire. The instrument was used to collect responses from both students and teachers, the two groups that are the subjects of the teaching and learning processes addressed by the study.

Results and Discussion

Table 1
Use of Chatgpt in Higher Education

Statements	N		Mean	Std. Deviation
	Valid	Missing		
ChatGPT assists students in obtaining new data.	119	0	1.0331	0.17953
ChatGPT assists students in achieving a greater understanding of things.	119	0	3.7107	0.90773
Learning can be enjoyable with ChatGPT.	119	0	4.1488	0.78168
At one forum, ChatGPT offers the most information.	119	0	4.4793	0.83765
ChatGPT can encourage interactivity and engagement.	119	0	4.0744	0.87717
The learning atmosphere offered by ChatGPT is a beneficial one.	119	0	3.9504	0.92061
An efficient instrument for education is ChatGPT.	119	0	4.2893	0.82095
Students feel pleased when they use ChatGPT.	119	0	4.1157	0.96773
In my opinion, it has a user-friendly interface that allows for easy navigation.	119	0	4.1405	0.73378
ChatGPT serves as a potent medium for individualized, self-directed learning.	119	0	4.1322	1.00782

From Table 1, we took the average of the statements provided and came up with a total mean of 3.804. That means our respondents lean positively, and 76% of our total sample supports our first research question.

Table 2
Assimilation of AI into the educational sector

Statements	N		Mean	Std. Deviation
	Valid	Missing		
ChatGPT serves as a potent medium for individualized, self-directed learning.	119	0	4.0413	0.89812
ChatGPT can take intricate ideas and express them in a more understandable way.	119	0	3.7190	0.89650
The latest information is provided by ChatGPT.	119	0	4.0413	0.79997
Students regard ChatGPT as a trustworthy means of gathering information.	119	0	4.2314	0.91979
Students exclusively depend on artificial intelligence like ChatGPT when it comes to preparing for exams and conducting assignment work.	119	0	3.9835	0.88491
A student enjoys using ChatGPT to gather information.	119	0	4.1074	0.86411
While employing ChatGPT, students experience a state of relaxation.	119	0	4.2066	0.82581
ChatGPT can assist with any kind of assignment or project, including ones that require mathematical graphs or scientific diagrams.	119	0	3.9587	1.09846
Issuing a command to ChatGPT in order to achieve the intended effect is not straightforward.	119	0	4.1322	0.88452
The students in higher education have become very familiar with ChatGPT.	119	0	4.2645	0.82430

Table 2 indicates that the total mean sum is 4.0686. This suggests that those who responded to our questionnaire largely support our second research question. About 81% of our entire population indicates that they support our first research question.

Table 3
Chatgpt as teaching assistant

Statements	N		Mean	Std. Deviation
	Valid	Missing		
Using ChatGPT for every job is a good practice.	119	0	3.9421	0.92464

While ChatGPT generally produces good answers, it occasionally creates some problems.	119	0	3.5868	0.99724
ChatGPT has the potential to influence how students think on a fundamental level, and those students are relying on it more and more.	119	0	3.9008	0.97814
People might come to rely exclusively on ChatGPT to perform all of their tasks.	119	0	4.0826	1.02946
Using ChatGPT could lead to some misunderstandings in terms of responses.	119	0	3.8347	1.01937
ChatGPT is capable of producing inaccurate responses.	119	0	3.9091	0.97468
The learning process can be affected by the creation of bias in ChatGPT, as it can respond differently to identical prompts.	119	0	4.0083	1.04480
It is essential to teach students to use artificial intelligence in an ethical manner.	119	0	3.8760	0.97954
ChatGPT could cause issues in academia because it might lead to direct copying without students first verifying the content.	119	0	4.1322	0.93043
The answers given by ChatGPT must be verified for accuracy and reliability.	119	0	4.1653	0.91603

Table 3 shows an overall average of 3.9438, which indicates that our third research question receives support from the respondents. To put it another way, 78.8% of the total sample population expressed that they are in favor of the first of our three proposed research questions.

Discussion

We looked at how ChatGPT can be used in higher education and whether it can be an effective tool. At first, we were leaning toward the idea that ChatGPT could be a mechanism for pushing students toward a more productive and personalized learning experience, but we had some reservations about whether it was currently effective in serving that specific purpose. Still, we believe that increasing the salience of AI in the higher education space, especially for students, is a good thing. And ChatGPT – that it is to say, using it or simply engaging with it – seems to be a good vehicle for doing just that (Montenegro-Rueda et al., 2023).

The assimilation of AI into the educational sector has greatly affected – indeed, improved – the overall effectiveness and quality of learning. This influence is observed not only in the realm of learning itself but also in all manner of administrative functions that education requires. AI helps prepare the kind of personalized learning materials that can help a student truly learn and perform at a level that fits either their capabilities or the kind of disabilities that they might have. And indeed, we are hearing more and more about AI from foreign educational systems – sometimes with an implied threat to traditional instructors, since the very term "AI" tends to make people think of robots. Several countries have started teaching AI as a subject in their schools. Students' futures are intertwined with AI. The technology has permeated the educational sector, just as it has many others. In our work here, we will use the term "AI" to specifically refer to the generative tools and technologies that are currently available (Fuchs, 2023).

We will use tools like ChatGPT as our "teaching assistant." And we learn alongside our students. In the developed world, they are already using robots in some parts of kindergarten education. So you just might have a future working with AI in some capacity as an educator. Here are some more advantages that we're slicing out for educators. In educational contexts, ChatGPT can lighten the load of work. For example, it can help in producing the materials for lesson plans, and it can help in producing notes

for the curriculum. It can also help in grading assignments. If a teacher has 50 papers to read, and if those papers are read by ChatGPT, then the teacher will get back 50 grades and 50 comments in the time it takes to read one paper. Moreover, ChatGPT can assist at every level of the educational staircase: K-12, community college, and university. If we add to this the fact that it can handle multiple conversations at once, then we can begin to see why some people think that ChatGPT has a future in education (Prananta et al., 2023).

ChatGPT functions as a linguistically informed search engine that responds according to demand. In my investigational work, I have found that within our higher education system, undergraduates are using ChatGPT in unequal numbers. Male advantage is clear; female disadvantage is largely unexamined and, as is often the case, is being tolerated. ChatGPT being used by students is a fresh application for Artificial Intelligence (AI) in the realm of education, with only a couple of pertinent studies having been conducted thus far. Students in these studies believe that using ChatGPT helps them feel more confident in understanding and completing their learning tasks. Nonetheless, there are a couple of serious nagging issues that accompany the use of ChatGPT that are not and should not be ignored. Students tend to depend too heavily on ChatGPT, which may damage their talents and skills. ChatGPT is being lauded as an essential tool in the academic arsenal of both teachers and students. However, there are worries about data security and privacy, and the accuracy of the tool's output when it comes to discussing use in an educational context. Still, ChatGPT appears to be more effective than traditional lecture methods when it comes to teaching at the university level (İpek et al., 2023).

Conclusion

ChatGPT is having a significant and possibly transformative impact on higher education. The study emphasizes that using ChatGPT can help individuals achieve a more personalized learning experience. However, reliance on the platform could also increase academic dishonesty. As the researchers note, Today's students simply do not want to put in as much time as previous generations did, and they seek shorter methods of achieving their educational aims. The authors also explored the potential benefits and drawbacks of using ChatGPT. Some downsides that were noted included the reliability of the knowledge being imparted and the potential for increasing plagiarism. It is like students to desire a life free of stress and to seek readily available solutions to their problems. When it comes to making study notes, for instance, many students prefer enlisting the help of an AI tool instead of doing the work themselves. At higher levels of education, too, the use of ChatGPT is becoming more and more mainstream. One reason is that it generates text that can easily be mistaken for something written by a human. However, there are also serious downsides to using ChatGPT. When students rely on it to do their work for them, they're not exercising their critical thinking skills. They're not using ChatGPT to augment their intelligence but rather to replace it.

Recommendations

Here are some recommendations based on research findings.

ChatGPT is increasingly being adopted in our colleges and universities, and we recommend that its use be permitted. We advise our institutions to craft usage policies about ChatGPT and other AI tools. Because the unethical usage of these powerful tools has implications for our colleges and universities, we recommend that they be included in our curricula in some way (perhaps across disciplines) so that students understand the tremendous responsibility that comes with using AIs. Finally, we believe that the pro-

social and anti-unethical usage of ChatGPT can have profound implications for the kinds of personalized learning experiences that many colleges and universities are embracing.

It is very advisable to look for the opinions of educators in higher education regarding how they feel about using ChatGPT. This seems especially relevant since ChatGPT is a rapidly emerging tool for potentially reshaping the future of higher education. While this research shouldn't ignore the negative uses of ChatGPT, it seems wise to primarily focus on its positive potential.

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