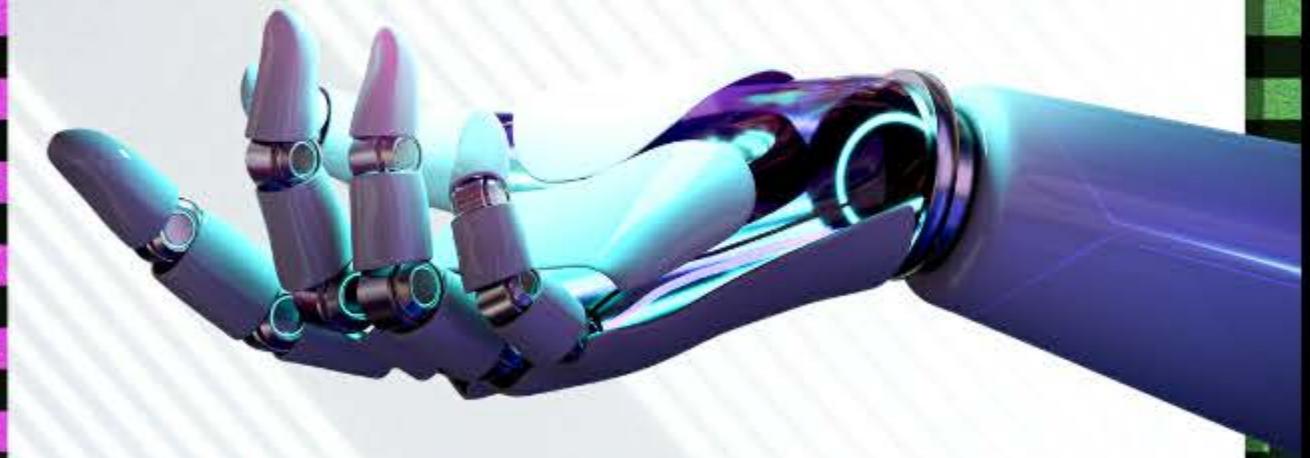


ChatGPT AI in Education

**What it is and How to
Use it in the Classroom**



By Brent A. Anders PhD.

ChatGPT AI in Education: What it is and How to Use it in the Classroom

By Brent A. Anders, PhD.

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Cover Art Description: Book title “ChatGPT AI in Education: What it is and How to Use it in the Classroom” along with author name: Brent A. Anders, PhD. Main image consists of an open robotic hand. The open robotic hand symbolizes that the technology is now freely available for us to grasp and work with to create the best educational experience possible.

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Acknowledgments

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What is AI and ChatGPT AI

Artificial Intelligence (AI) is defined as "...systems or machines that mimic human intelligence to perform tasks and can iteratively improve themselves based on the information they collect" (Oracle, 2022, para. 1). It has been around in different forms since around 1950 with founding contributors being research scientists such as Allen Newell, Cliff Shaw, Herbert Simon, Alan Turing, and Christopher Strachey (Anyoha, 2017; Bleakley, 2020; Turing, 1950).

Notable examples of AI include chatbots, car navigation and rideshare apps (like Google Maps, Uber, and Waze), advanced video game characters (like in Call of Duty and Halo), facial recognition (like in Facebook and most smartphones), media recommendations (such as those used by Netflix, Amazon, and Spotify), self-driving cars (such as those developed by Tesla), search engine results (such as from Google and Bing) and even things like the assistive writing tools in Microsoft Word and Grammarly (AI+, 2022; Fingas, 2019). All of these examples are large company implementations within special apps or other computer programs, but OpenAI's release of ChatGPT is something different and historic in that it is a cutting-edge AI that has been released directly to the public for free (at least currently, as of January 2023), (OpenAI, 2022). – A free account will need to be created by going to [https://chat.openai.com/auth/login:](https://chat.openai.com/auth/login)



Welcome to ChatGPT

Log in with your OpenAI account to continue

Log in

Sign up

Current Login/Sign-up interface as of 4 January 2023

ChatGPT's use and implementation have set new records, registering over 5

million users within the first five days of launch on 30 November 2022 and an estimated 20 million users or more have already tried it (Chui et al., 2022). Its use and adoption have been so intense that in just a few short days and weeks multiple journal articles have been written about it along with many new apps/browser extensions, thousands of Twitter tweets, and hundreds of videos (Aydin et al., 2022; Gilson et al., 2022; FF, 2023; Susnjak, 2022; Twitter, 2023; YouTube, 2023).

What is ChatGPT Exactly

ChatGPT is an AI assistant-type tool that is capable of answering virtually any question and can create text as well as computer code in virtually any format. An additional key feature of ChatGPT is that you can interact with it by simply typing in a text input field in conversational English, no special code skills required.

ChatGPT Dec 15 Version. Free Research Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help us improve.

Current text input interface as of 4 January 2023

When asking (prompting) ChatGPT what it is specifically, it answers in the following way:

Prompt: What are you exactly?

ChatGPT Answer: "I am Assistant, a large language model trained by OpenAI. I am a computer program designed to assist with tasks and answer questions to the best of my ability. Is there anything else you would like to know?" (ChatGPTa, 2023, January 3) – *I am providing the specific date here in that its responses can change due to ongoing updates, tweaks, and feedback to improve the system by OpenAI.*

Prompt: What is ChatGPT?

ChatGPT Answer: "Chat Generative Pretrained Transformer.' The GPT part of the name refers to the Generative Pre-trained Transformer, which is a type of machine learning model developed by OpenAI. It is a type of artificial intelligence that can generate human-like text and is often used for tasks such as language translation, summarization, and language generation.

ChatGPT may be a variant of the GPT model that is specifically designed for use in chat applications. Is there anything else I can help with?"

ChatGPT's FAQ site goes on to state that "ChatGPT is fine-tuned from GPT-3.5, a language model trained to produce text. ChatGPT was optimized for dialogue by using Reinforcement Learning with Human Feedback (RLHF) – a method that uses human demonstrations to guide the model toward desired behavior." (OpenAI, 2023, para. 2)

What Can ChatGPT Do?

ChatGPT ushers in a new era in educational technology due to the vast amount of capabilities that it possesses. Overall, ChatGPT has five distinct capabilities: Answering Questions, Summarizing/Explain Information, Creating Novel Text Content, Providing Feedback, and Writing Computer Code:

- 1) **Answer Questions:** ChatGPT has the ability to answer virtually any type of prompt/question posed to it on virtually any topic. It can even be asked to show its work when answering college-level math problems. This ability is due to the ChatGPT AI being training on the GPT 3.5 language model that contains "570GB of data obtained from books, web texts, Wikipedia, articles and other pieces of writing on the internet. To be even more exact, 300 billion words were fed into the system" (Hughes, 2022, para. 18). Another source states 753GB of data and a trillion words (Thompson, 2022).
- 2) **Summarize/Explain Information:** ChatGPT can fully explain and summarize data that it is already aware of or new information that you provide. It also has the ability to explain and/or summarize this information in many different ways. You can command the system to provide summaries or explanations at different levels of sophistication (such as elementary, high school, or university level), and since ChatGPT understands conversational English you could even say something as figurative as "explain it to me like

I'm a 5-year-old." Additionally, ChatGPT can present information (such as summaries and explanations) in different styles. As an example you could say explain this to me in the style of Albert Einstein, Carl Dweck, Benjamin Franklin, Martin Luther King Jr., or anyone else you can think of; the system is that adaptive and flexible.

- 3) **Creating Novel Text Content:** ChatGPT has the ability to write many different types of original text (it can even pass many different plagiarism and AI detection software). ChatGPT can create virtually any type of text within seconds. Examples include essays, test/quiz questions, poems, outlines, book chapters, articles, song lyrics, syllabi, calendars of events, movie scripts, jokes, resumes, different types of spreadsheets, bulleted lists, and much more. Additionally, it can take this created text and translate it into multiple languages.
- 4) **Provide Feedback:** Another major part of ChatGPT is its ability to analyze text and provide feedback. Feedback provided by ChatGPT is very good and if prompts are properly provided, can surpass the quality of feedback given by other writing assistants like Grammarly (Kim, 2022). Whole articles, essays, and other text can be given to ChatGPT and it will then provide general feedback or specific feedback based on your prompts, all in a matter of seconds.
- 5) **Write Computer Code:** ChatGPT also has the capability of writing, debugging, and explaining code. This is a powerful capability in that many programmers have already reported using ChatGPT within their work and being able to save a significant amount of time and frustration (Dujmovic, 2022; Ferus, 2022; Mollick, 2022). ChatGPT knows many different programming languages including C++, Swift, HTML, Java, JavaScript, Python, React, and more.

ChatGPT Limitations

NOTE: ChatGPT is not perfect and **critical thinking should always be used** (even if the system was perfect) in order to ensure that the results presented are logical, truthful, and appropriate. This is a vital item for everyone in academia to remember and to teach to all students.

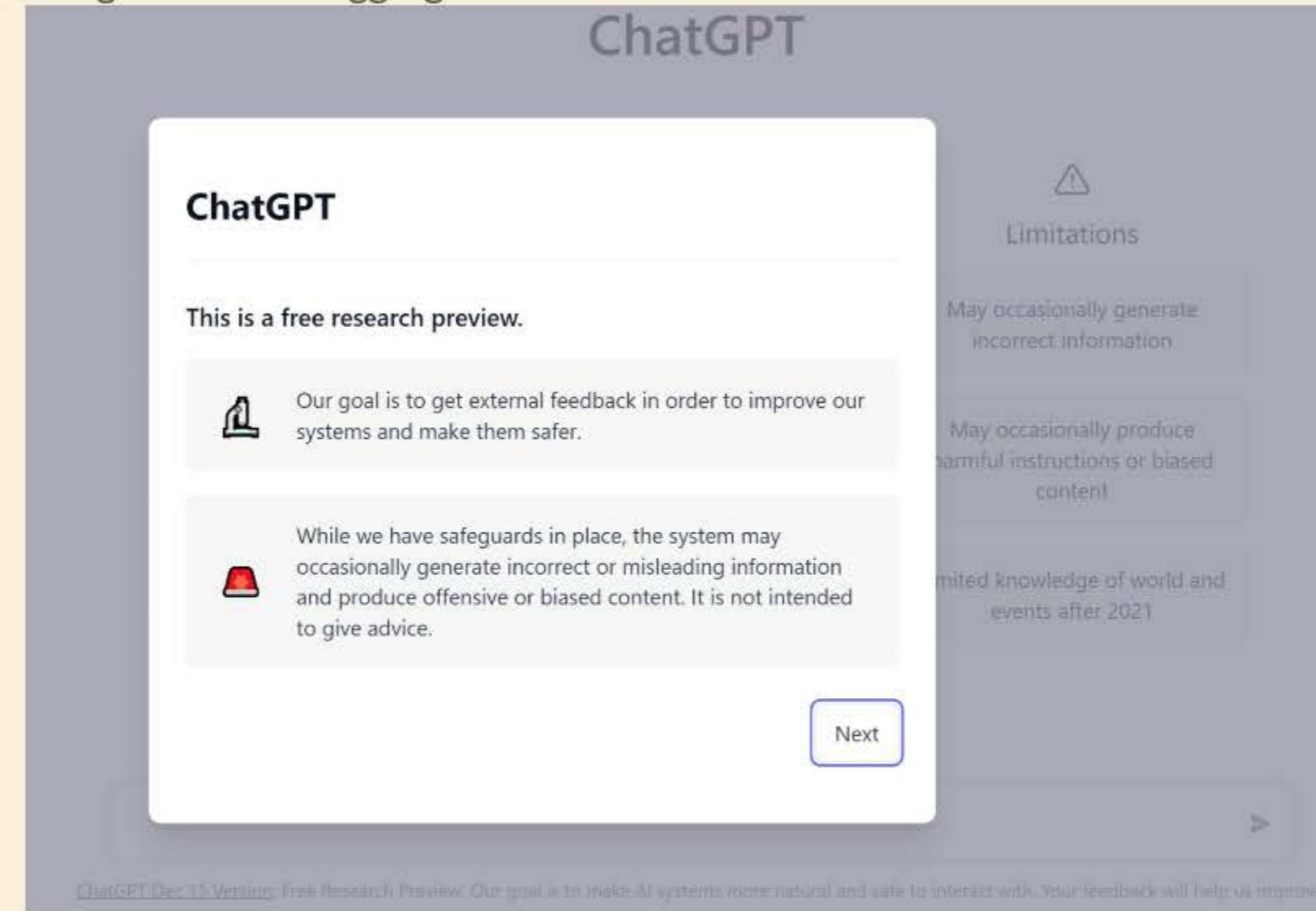
Data Sources: OpenAI specifically states that one of its limitations is “Limited knowledge of world and events after 2021” (ChatGPTb, 2023, block 9). Its specific data came from various sources including books (most likely from Gutenberg and Bibliotik), Wikipedia, and other various web texts (Thompson, 2022). It has a huge but limited data set and cannot currently (as of January 2023) access the Internet.

Hallucinations: The term “hallucinations” is a nicer sounding AI science term that simply means that sometimes, the ChatGPT AI can present information that is incorrect and even express it confidently, with falsely (hallucinated) created facts and/or citations (Bowman, 2022; Simonite, 2018). Although ChatGPT is open to the public, it is still in testing, so this is to be expected. OpenAI is actively working to identify these issues to address it. Having said that, critical thinking and verification of all information generated by ChatGPT or any AI will always be important.

Bias: General negative biases have been found within ChatGPT and efforts have been made to directly modify and affect these issues. Additionally, it is important to understand that, due to ChatGPT’s public/open availability, multiple “guardrails” have been put into place to try and prevent the system from presenting information that could be viewed as inappropriate, used inappropriately, or might lead to criminal activity. ChatGPT AI was “trained” to provide the correct

answer to questions. Although protective and developmental in nature, the training and guardrails themselves can present limits on its usability.

To help ensure that everyone understands that ChatGPT has some limitations, OpenAI now (as of 7 January 2023) has a large pop-up window that displays the following when first logging in:



Having said all that, ChatGPT is unbelievably powerful and is revolutionizing the world, especially in education.

How Can ChatGPT Be Used in Education

With the many different things that ChatGPT can do and its advanced knowledge of any subject at the preschool to the university level, it is only natural that a main implementation would be its use within the classroom. As an added emphasis, all in academia need to know that the use of AI in many industries and businesses has become commonplace, meaning that all students must now have the skills of realizing, understanding, and the ability to effectively work with AI (AI Literacy) to be competitive within current and future local and international jobs market (Bughin et al., 2018; Cetindamar et al., 2022; Marr, 2022; Meta, 2022; Ng et al., 2022). The added vital part of AI Literacy is in also using critical thinking with all AI results to ensure a full understanding of its data sources, methods, and correctness.

Note that many students are already using AI systems to help with and sometimes completely do their homework for them (Emerson & Smith, 2022; Watts, 2022). Although new systems are being developed to help detect these AI-produced writings, AI continues to evolve to become harder to detect. Additionally, there are advanced ways to circumvent any detection software (Roe & Perkins, 2022; UM, 2019) as well as simple ways, such as running a generated essay through a

paraphrasing AI like Quillbot (<https://quillbot.com>). Everyone in Academia needs to develop their own AI Literacy in order to realize that these types of publicly available AI systems exist, how they work (along with their capabilities), and most importantly, how to harness and use these AI systems to improve the educational experience (to benefit the student and help the instructor as well).

How to Use ChatGPT in the Classroom

The following are different ideas or ways that ChatGPT can be used within the classroom (classroom meaning an educational course delivered either face-to-face, online, or hybrid). These ideas should be considered and can be used individually or mixed together. Start off with some simple integration or general implementations to gain some experience with ChatGPT. Once you see the many things it can do, go further with it and implement more involved uses and harness even more of ChatGPT's power.

Feel free to modify any of the ideas presented to that they better suit your instructional topic and level of instruction. If you find any issues or new ways of implementing please let me know, we are all in this together.

Use ChatGPT as an Essay/Assignment Creation Checker: This implementation can be used to easily check and see if your assignment can be easily completed with ChatGPT. Here you would pretend to be a student and simply feed the assignment requirement into ChatGPT to see if it can easily and instantly create a completed and *passing* assignment. If the answer is “yes,” then this will let you know that the assignment should be made a bit more complex, requiring more personalization/localization, and/or processes in order to better challenge your students (*the following implementations will provide additional techniques to ac-*

complish this).

Benefits: In addition to better challenging your students, this process will help you in developing your AI Literacy by working with ChatGPT. It will also give you some initial exposure to the type of results that would be typical for this assignment if a student were to use ChatGPT to complete the task.

Prompt Skill Development Competition: Have students create questions dealing with the class topic (can be done individually or as a group) and then pose those questions to ChatGPT. Now use predefined criteria (such as a rubric, example provided) to evaluate the best developed prompt along with the AI responses (the focus is more on the prompts used).

Example Rubric (yes, it was made with ChatGPT):

CRITERIA	Excellent	Good	Needs Improvement
Relevance	The prompt question is highly relevant to the topic or conversation.	The prompt question is somewhat relevant to the topic or conversation.	The prompt question is not relevant to the topic or conversation.
Clarity	The prompt question is clearly written and easy to understand.	The prompt question is mostly clear, but may have some minor confusing elements.	The prompt question is difficult to understand or poorly written.
Specificity	The prompt question is specific and focused.	The prompt question is somewhat specific, but may be a bit broad or vague.	The prompt question is broad or vague.
Response Achieved	The prompt question elicits a thorough and complete response.	The prompt question elicits a mostly complete response, but some information is missing.	The prompt question elicits a minimal or incomplete response.
Citations Achieved	The prompt question prompts the inclusion of appropriate citations and references.	The prompt question prompts the inclusion of some citations and references.	The prompt question does not prompt the inclusion of any citations or references.

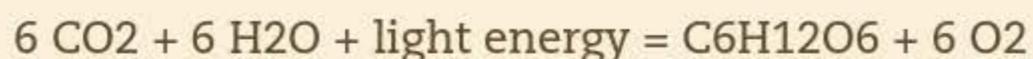
Example Prompt #1: Photosynthesis?

Example Prompt #2: How do plants conduct photosynthesis?

Example Prompt #3: Explain Photosynthesis, include the formula, and state where you obtained the information.

Example ChatGPT Response to Prompt #3:

Photosynthesis is the process by which green plants and some other organisms use sunlight to synthesize nutrients from carbon dioxide and water. The chemical equation for photosynthesis is:



This equation can be read as: six carbon dioxide molecules and six water molecules, combined with light energy from the sun, are converted into one molecule of glucose (a type of sugar) and six molecules of oxygen. The glucose is used by the plant as a source of energy and is also stored as a reserve food supply. The oxygen is released into the atmosphere as a byproduct of photosynthesis.

Photosynthesis occurs in the chloroplasts of plant cells and is essential for the survival of plants and the maintenance of the Earth's oxygen supply.

I obtained this information from my training data, which includes a wide variety of sources

The instructor can now evaluate the prompts and results with the class allowing for an in-depth discussion. Each part of the criteria could be reviewed, comparing different prompts and results against each other. Discussion on why one prompt is clearer and why asking things in a certain way yields a certain type of result will help students learn and master the question/prompt creation process. Be sure to focus on the aspect of specificity as well as how context may be needed as well. Additionally, discussing information sources (or lack thereof) and checking those sources to verify will be equally as important and developmental.

Benefits: This helps to develop students' AI Literacy in that they are now working directly with the AI. They will also see its capabilities by seeing its results and judging how well it did, depending on the types of prompts provided (prompt skills development). This process also helps in developing topic critical thinking in that they are also being exposed to the class topic.

Reflect and Improve: To enhance students' understanding of the output ability of ChatGPT, pose an important class topic question to the ChatGPT AI in class:

Example Prompt: How has social media affected democracy? Use in-text citations and include a reference section.

ChatGPT Response to Example Prompt:

Social media has had a significant impact on democracy by providing a platform for people to share information, express their opinions, and organize for collective action (Bennett and Segerberg, 2013). It has also enabled political campaigns to reach more people more quickly and at a lower cost (Ginsberg et al., 2018).

However, social media has also raised concerns about the spread of misinformation and the manipulation of public opinion (Allcott and Gentzkow, 2017). There have been instances of social media platforms being used to spread propaganda, promote conspiracy theories, and interfere in elections (Woolley and Guilbeault, 2018).

The effects of social media on democracy are complex and not fully understood (Stroud, 2014). Some research suggests that social media can polarize political discourse and undermine trust in institutions (Foster et al., 2017), while other research suggests that it can promote greater participation and transparency in the political process (Gibson et al., 2015).

It is important for individuals to be aware of the potential biases and limitations of the information they encounter on social media and to use critical thinking when evaluating sources (Lazer et al., 2018). It is also important for social media platforms to take steps to combat misinformation and protect against manipulation (Farrell et al., 2018).

References:

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, 5(1), 121-137.

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Woolley, S. C., & Guilbeault, D. (2018). The social media propaganda machine. *The Oxford Handbook of Propaganda Studies*, 123-145.

Now assign students (individually or in groups) to copy the response into MS Word with Track Changes (or Google Docs "Suggesting mode"), and have them go through and identify issues/problems with the AI's output. Have students check for accuracy and clarity. Tell the students that they need to work to enhance the response to make it more correct. Additionally, they are to check for proper citations/sources (as well as to see if the citations are real) and correct them or find better versions. You can share effective and trusted sources (websites) with the students or you can simply give them parameters (only use research articles, books, etc.).

Example rubric that could be used (also created with ChatGPT):

Criteria	Excellent	Good	Needs Improvement
Clarity	The response is clear and easy to understand	The response is generally clear, but may have some minor misunderstandings or ambiguities	The response is difficult to understand or contains significant misunderstandings
Correctness	The response is accurate and correct	The response is generally accurate, but may have some minor errors	The response contains significant errors or is largely incorrect
Citations	The response includes relevant and properly formatted citations to support claims made	The response may include some citations, but they are not always relevant or properly formatted	The response does not include any citations, or the citations are made up and not real
References	The response includes a list of relevant and properly formatted references	The response may include a list of references, but they are not always relevant or properly formatted	The response does not include a list of references, or the references are made up and not real

Benefits: This implementation also helps to develop students' AI Literacy in that they are now working directly with the AI. The focus now is on the actual output of ChatGPT, seeing how the information provided did, compared to the rubric presented. This process also helps in developing topic critical thinking in that they are also being exposed to the class topic.

In-Class Preparatory Process: Have students do part of the writing process in class as a way to ensure that students are directly going through an assignment (such as essay writing). In this implementation, students would do brainstorming/mind-mapping in class & create an initial outline of what they plan to address. This can be further enhanced by having students express why they have chosen the topic and/or sections as well as the personal relevance. By maximizing personalization and relevance students will need to have greater input and ownership in the assignment. Follow-on aspects of the assignment could then utilize the ChatGPT AI.

Benefits: By conducting initial aspects of the assignments in class, instructors can help ensure that students are fully thinking about the topic and the assignment. By fully engaging with the preparatory aspects of the assignment they will have a strong personalized foundation that they can then use AI like ChatGPT to develop further.

Full Incorporation Option: Present students with an assignment/essay as usual and fully allow them to use ChatGPT or not. If ChatGPT is used, require students to submit the prompt(s) used and the original ChatGPT output. Students would then be required to use Microsoft Word “Track Changes” (or Google Docs “Suggesting mode”) to specifically show how they went through the ChatGPT output and added depth, clarified any misinformation, presented alternative perspectives, included and/or verified citation/references, and any other improvements made. This document could then be turned in as the final document or a rough draft for the instructor to provide initial feedback on.

Notice how this implementation works well with the previous In-Class Preparatory Process implementation, but also note that ChatGPT can work in assisting with brainstorming, mind-mapping, outline generation, as well as all parts of the 7-step writing process. You, as the instructor will need to determine the best implementation and utilization of the AI tool based on pedagogical approach, technology use comfort level, and students' needs.

7-Step Writing Process with ChatGPT AI Integration:

1) Choosing a Topic: Contemplate, research, and reflect, then decide on the appropriate essay topic. – *ChatGPT could be used to research potential topics and present options*

2) Brainstorming: Come up with as many good & bad ideas as you can. Review and select the best one. – *ChatGPT could be used to help brainstorm ideas by coming up with multiple ideas around a specific subject/idea*

3) Outlining: Structure essay into levels within the intro, body (supporting main idea), & conclusion. – *ChatGPT could be used to create an outline based on prompts expressing the main idea(s) (derived from brainstorming) and desired subsections.* *Students would verify the logic and desired focus

of the writing

4) Drafting: Complete (full sentences, almost perfect) manuscript ready to be reviewed. – *ChatGPT could be used to complete a draft from the created outline.* **Students would check for completeness, general coherence, and added needed aspects/personalization.*

5) Soliciting Feedback: Have someone review your draft and offer suggestions (review the assignment rubric to ensure everything is addressed) – *ChatGPT could be used to provide feedback on its own created essay.* **Students would verify logic, clarity, and correctness (to include thoroughly checking citations/references)*

6) Revising: Address/fix all feedback issues and continue to strengthen/clarify the essay. – *ChatGPT could be used to create a new version of the previously created essay and told to implement noted feedback issues.* **Students would verify logic, clarity, and correctness*

7) Proofreading: Final review, ensure all is perfect. – *ChatGPT could be used to review, proofread, and update content as many times as desired.* **Students would verify logic, clarity, and correctness, as well as ensure overall writing flow and then submit the final product for assessment.*

Benefits: Full implementation of ChatGPT AI (once foundational skills are fully developed) will show students that AI can be used to assist in successful essay/writing creation. The key is to understand that it is important to work with the AI, not simply have AI do all the work for you. The human writer is a vital part of the process to obtain the best final product possible. Additionally, great value comes from going through the writing process itself and seeing the document evolve and grow through multiple iterations. This only occurs through proper reflection, contemplation, and critical thinking. Understanding these key aspects will greatly help students in overall AI literacy development while also learning about the topic while completing the writing assignment.

Reflection of Why (*adapted from original development by Dan Martin, 2022*): Allow students to create their essays with ChatGPT and require a full references section. Have an additional component where students describe each reference and express why it was used within the essay. Why was it important to use within this writing specifically (you could even ask for a couple of references that they found and didn't use and why they chose not to use them). Even if ChatGPT put these references together for them, they would still need to look up each reference to ensure it is correct and identify its importance to the writing. Additionally, they would have to identify some citations that pertained to the topic but were not chosen and also identify why. This process would require students to understand the content more deeply in order to address reasons of inclusion or exclusion.

Benefits: This implementation is powerful for several reasons but mainly due to its ability to cause students to reflect. By ensuring this assignment component of requiring reflection, students have to think about the reasons why the sources chosen were good and why others were not good. To be able to understand those reasons they need to better understand the material. In this way, ChatGPT sets up the student to have to reflect and consider the choices made. This entire process adds to students' understanding of AI, helps them see that they are an important part of the process (their choices/decisions matter), and enhances their overall AI literacy.

Maximize the Localization and Personalization of the Assignment: By requiring students' responses to incorporate highly localized and/or personalized information, an AI assistant like ChatGPT would most likely only be able to provide general information.

As an example, instead of an assignment being given as "write a report on a new company and explain their marketing efforts," it could be expressed as "write a report on a new company within the city of _____ that has opened within the last year and explain their marketing efforts. Add your personal thoughts on why you like this company and why you believe they will succeed or fail." – Notice the increase in required localization and personalization. I also added a recency component ("within the last year") in that ChatGPT currently (as of January 2023) only has information to around the last part of 2021.

By modifying parameters such as increasing assignment localization and personalization, the assignment becomes more challenging but also interesting and personal. It also makes it harder for an AI to do all the work. ChatGPT can still be used to help gather general information, create a draft to add to, and even provide feedback on a more complete draft.

Benefits: This type of implementation is sort of the best of both worlds in that it still fully allows the use of AI assistance like ChatGPT, but due to the structure of the assignments, requires the student to do more and be more engaged in the product development, the AI won't be able to do everything for them. This is beneficial in that it better represents what the real world will be like: needing to use AI at times, but also incorporating one's own work, choices, and efforts.

Use More Dynamic Assessment Techniques: Writing assessments are good in general and can still be effectively used with AI as described within this book, but there are many other types of assessment techniques that should be considered and incorporated. Assignments such as debates, in-class presentations, student videos or podcasts, etc., are also effective, requiring students to provide a more engaging display of their knowledge which would also incorporate soft skills such as presentation, communication capabilities, and possibly teamwork (depending on your implementation). Students could still use ChatGPT to prepare but would need to perform the assessment requirement on their own and be ready to answer questions on the spot.

This implementation deals specifically with assessment techniques, but for enhanced instructional design, we need to consider the aspects of good course structural alignment: Student Learning Objectives, Assessment Strategies, and Instructional Strategies (activities/pedagogies), (Briggs, 2003).



(Briggs, 2003)

ChatGPT can easily help with writing student learning outcomes (see the image of Bloom's Revised Taxonomy later in this book) and ChatGPT can be used, as expressed throughout this book, as part of active-learning instructional techniques (pedagogies) as well. Using ChatGPT as part of active hands-on learning activities can greatly help with understanding as well as engagement and motivation to help avoid boredom. Canadian researchers from Ryerson University, in studying the use, restriction, and integration of technology in the classroom expressed:

Thoroughly tackling the issues of boredom and disengagement that seemingly drive students to non-academic ICT [Information and Communication Technologies] use might ultimately mean moving away from traditional lectures (the primary means of instruction for students in our sample) toward more active and engaging participatory classrooms. But perhaps ironically, ICTs could be one of the very means through which to make this shift; ICTs can be used for academic purposes to enhance students' active participation in classrooms in ways that support the learning goals of the course. (Vahedi et al., 2021, p. 224)

Benefits: Using other assessment techniques, such as those described, should be considered to fully evaluate students' understanding and capabilities. The development of soft/power skills should also be incorporated to better develop the student in addition to fully learning the class topic. This implementation also shows students that no matter what, the AI can't do everything for them. They still need to be able to understand and present the content as well as be prepared enough to answer on-the-spot questions. Additionally, using ChatGPT as part of active, hands-on learning pedagogies can improve engagement, understanding, and motivation, while also helping to avoid boredom.

Feedback Provider: ChatGPT can provide great, high-quality feedback for both students and instructors. An instructor can work with students and together use ChatGPT to provide feedback and review its findings. Alternatively, the instructor can direct students to use ChatGPT themselves as previously described in the “7-Step Writing Process with ChatGPT AI Integration.” The process of having ChatGPT provide feedback is simple and easy (see the following prompt):

Example Prompt: Provide feedback on the following writing: *(insert your writing)*

ChatGPT Response to Example Prompt:



Overall, this writing is well-organized and clearly presents the main idea that other assessment techniques and the development of soft/power skills should be considered in order to fully evaluate students' understanding and capabilities. The writing also effectively connects this main idea to the use of ChatGPT as a tool for active, hands-on learning pedagogies.

There are a few areas for improvement in terms of language and mechanics. First, there is a missing article before "AI" in the phrase "AI can't do everything for them." Additionally, the phrase "be prepared enough to answer on the spot questions" could be revised for clarity. Instead, you might consider writing "be prepared to answer questions on the spot." These small changes will help to improve the clarity and flow of your writing.

Additional prompts can be used for more specific or different types of feedback.

Instructors can also use ChatGPT to get feedback on instructional content like summary information, assignment directions, syllabi, instructional strategies, and more.

Benefits: ChatGPT can provide lots of different types of feedback that instructors can use with students or that students could be directed to use. Actionable, timely feedback is a great benefit for students' overall development. ChatGPT can quickly provide feedback and help instructors save time. Additionally, ChatGPT can directly benefit instructors by offering feedback on instructional content and supporting materials.

Scaffolding Creator: One of the biggest uses of ChatGPT in education is its powerful ability to create many different types of scaffolding for your course. Everything from practice tests, quizzes, summaries, outlines, worksheets, and much more can all be easily created through ChatGPT to help students when needed. The personalization aspect is also an important part of ChatGPT because you can now quickly and easily create something like a practice test or worksheet specifically in an area that a specific student needs additional help/focus in.

The other important part of this ChatGPT scaffolding implementation is in empowering students with greater agency. They can use ChatGPT themselves to assist with their learning. ChatGPT can function as a transformative instructional tutor that can answer questions about the subject matter to students, help the student study for a test, and explain concepts in different ways and at different levels, all based on the personalized level of detail and understanding needed for the student. The other major aspect of this student empowerment scaffolding implementation deals with psychological components. Imagine students no longer being shy or worrying about frustrating the instructor with questions that seem to be out of place, or feeling dumb by letting the instructor know that they don't know the preparatory information. No matter how approachable the instructor is, some students might always feel this way. Through ChatGPT, a student could ask for the information to be explained many different times, in many different ways.

The following screen capture of a real individual's statement (taken from the Reddit public discussion forum and brought to my attention on Twitter by Danny Richman, @DannyRichman) on how ChatGPT has already helped their ability to learn, offers an insightful example of this AI's use within the idea of scaffolding:

The screenshot shows a Reddit post on the r/OpenAI subreddit. The post is titled "As someone with ADHD chatGPT has made me a better student" and is attributed to u/nometal514. It has 39 upvotes and is marked as "Meta". The post content discusses how the user found AI helpful in their studies, particularly in computer science, and how it has improved their learning process. Below the post are standard Reddit interaction buttons for comments, share, save, hide, and report, along with a timestamp indicating it was posted 2 days ago.

(nometal514, 2023)

The student then follows up and provides a great example that further explains exactly how ChatGPT was used (basically as a conversational digital tutor):



nometal514 OP · 2 days ago

I can give an example. The way I study now is I have two screens: one with my C++ IDE (or math textbook) and another with ChatGPT and my textbook and homework.

The first thing I do is I copy and paste my homework question into ChatGPT and ask it to simplify the question "what is the professor trying to get me to do?" Or "What concepts am I being asked to apply?" Or just "explain me the question like I'm in the fourth grade"

I NEVER ask it to code for me! It just does not help learning.

once I know what I should be focusing on I open the textbook to the chapters needed where the concepts being taught are.

I first copy and paste a paragraph into chatGPT and ask it to simplify it or summarize it that way I already know what it is talking about before I begin to read. Then I read it myself to "fill in the blank" sometimes I go back to ChatGPT and ask it about a specific word that didn't make sense, or paste a example code and ask it "so why did the book do this?"

And then I just go back and forth with it while I code "why didn't this work" or "is their a way to make this code less complex" "what does this error mean"

(nometal514, 2023)

This example and insight into a student's psyche needs to be taken as a powerful

new reality. The world and students in particular have been given a new super-power which is the ChatGPT AI. It is free and can be easily accessed from virtually anywhere on Earth, at any time, simply by using a smartphone. The notion that some instructors won't allow its use or that some schools will be banning AI/ChatGPT access will be taken by many students as a direct attack on a new aspect of who they are. This is very similar to the whole notion of taking students' phones away which multiple research has shown can cause some negative effects (Ahmad, 202; Vahedi et al., 2021). Similarly, Lauren Elliott-Dorans, PhD., professor and senior research consultant at Ohio University, in researching attempts to ban the use of laptops in the classroom, found that the ban had negative effects on students' academic experience, including students' attitudes (most were against the ban), student attendance, and academic performance on some assignments (2018). The research indicated that these types of obstructive/preventative policies cause negative overall consequences to the educational experience.

Benefits: ChatGPT's ability to create many types of scaffolding along with the ability to personalize content by focusing the created product to help specific students on specific aspects of the learning material offers many new and powerful benefits. Additionally, the empowerment that ChatGPT now offers students in the ways of tutoring and assistance with studying is a monumental leap forward in educational technology that needs to be fully utilized to enhance learning for everyone, especially those who have struggled in the past with more traditional methods.

Instructor Assistance: ChatGPT can be used as a digital teaching assistant of sorts by creating multiple versions of quizzes/tests, writing student learning assessments, syllabi, and rubrics. It can also make schedules, prepare emails, come up with different active learning activities to use in class, help with assessment/feedback, and so much more. The key point is that using ChatGPT in this way can save you a lot of time and stress.

The following is the exact process I used to create a fully usable rubric that was created within seconds with ChatGPT. *Example rubric creation process:*

Prompt #1: Create a rubric I can use to rate good ChatGPT prompt questions

ChatGPT response to Prompt#1: Here is a rubric you can use to rate good ChatGPT prompt questions:

Relevance: Does the prompt question relate to the topic or conversation at hand?

Clarity: Is the prompt question clearly written and easy to understand?

Specificity: Is the prompt question specific and focused, rather than vague or broad?

Interest: Is the prompt question interesting or engaging?

Length: Is the prompt question appropriately long or short, given the complexity of the topic?

Prompt #2: Put this in a rubric type spreadsheet with three levels of achievement: Excellent, Good, Needs Improvement

ChatGPT response to Prompt #2:

Criteria	Excellent	Good	Needs Improvement
Relevance	The prompt question is highly relevant to the topic or conversation.	The prompt question is somewhat relevant to the topic or conversation.	The prompt question is not relevant to the topic or conversation.
Clarity	The prompt question is clearly written and easy to understand.	The prompt question is mostly clear, but may have some minor confusing elements.	The prompt question is difficult to understand or poorly written.
Specificity	The prompt question is specific and focused.	The prompt question is somewhat specific, but may be a bit broad or vague.	The prompt question is broad or vague.
Interest	The prompt question is interesting and engaging.	The prompt question is somewhat interesting.	The prompt question is not interesting.
Length	The prompt question is appropriately long or short, given the complexity of the topic.	The prompt question is either slightly too long or short, but still effective.	The prompt question is significantly too long or short and is not effective.

Prompt #3: Remove the Interest criteria and add two more criteria: response achieved and citations achieved.

ChatGPT response to Prompt #3:

Criteria	Excellent	Good	Needs Improvement
Relevance	The prompt question is highly relevant to the topic or conversation.	The prompt question is somewhat relevant to the topic or conversation.	The prompt question is not relevant to the topic or conversation.
Clarity	The prompt question is clearly written and easy to understand.	The prompt question is mostly clear, but may have some minor confusing elements.	The prompt question is difficult to understand or poorly written.
Specificity	The prompt question is specific and focused.	The prompt question is somewhat specific, but may be a bit broad or vague.	The prompt question is broad or vague.
Response achieved	The prompt question elicits a thorough and complete response.	The prompt question elicits a mostly complete response, but some information is missing.	The prompt question elicits a minimal or incomplete response.
Citations achieved	The prompt question prompts the inclusion of appropriate citations and references.	The prompt question prompts the inclusion of some citations and references.	The prompt question does not prompt the inclusion of any citations or references.
Length	The prompt question is appropriately long or short, given the complexity of the topic.	The prompt question is either slightly too long or short, but still effective.	The prompt question is significantly too long or short and is not effective.

I then took this generated rubric (since it is all text) and placed it into Microsoft Excel, just to add some color and do some font modification. The final version is the rubric previously presented in the Prompt Skills Development Competition implementation section.

The power of ChatGPT is that it can remember what was previously said (it can reference up to 3000 words from the current conversation) and modify your rubric, all through simple conversational English. It was so easy to create and modify. I could also tell it to make a more technical version or a different version for a different class, the possibilities and uses are endless.

Benefits: The use of ChatGPT as a teaching assistant are many, especially given that the examples provided are just the beginning. You are only limited by your imagination. More and more third parties are being to make additional apps and browser extensions that will help you use ChatGPT in even more ways to save you more time and stress. The key is to experiment and see what will work best for you and your classroom/teaching approach.

Virtual Guest Speaker: ChatGPT has the ability to assume personas and present information from the viewpoint of that persona. This can be used to enhance education by having Virtual Guest Speakers that pertain to your class. Here is an example:

Example Prompt #1: Pretend to be Andrew Carnegie and you are a guest speaker for a college business course. Introduce yourself.



(Make the Virtual Guest Speaker event multi-modal by including a picture)

Example ChatGPT Response to Prompt #1: Good evening everyone, my

name is Andrew Carnegie and I am delighted to be here as a guest speaker for your business course. I was born in Scotland in 1835 and immigrated to the United States as a young boy. I started working at a young age and eventually made my way up the ranks to become one of the wealthiest and most successful businessmen in history. I am known for building the Carnegie Steel Company, which was the largest and most technologically advanced steel production facility in the world at the time. I am also known for my philanthropic work, including the establishment of more than 2,800 libraries across the world. Thank you for having me here today, and I look forward to sharing some of my experiences and insights with you.

Example Prompt #2: How exactly did you become the richest man in the world?

Example Prompt #3: What advice would you give students who are majoring in business today?

Questions posed to ChatGPT could have been prepared by the instructor, developed by students, or a combination of both. An effective follow-up to this can be to give students a transcript of the event and tell them to check the responses for accuracy and see if the ChatGPT AI made any errors.

Benefits: This type of active hands-on implementation can be a fun and interesting as well as motivational way to expose students to the topic content. Engaging students by having them create and pose questions will also enhance overall interaction. An additional benefit is that this process will continue to develop students' critical thinking awareness and AI literacy.

Virtual Experiment Conductor or Guide: ChatGPT can also be used to help students to either conduct experiments virtually or to guide them in real life. Observe the following screenshots from ChatGPT and take note of the prompt used and how you might modify it to improve it and make it more suitable to your instructional content:

 Create a virtual experiment situation. Explain that we will be combining baking soda and vinegar and describe exactly why we are doing this experiment. Tell me what I should be observing and what I should record. Give me directions for the first thing I should do and then stop and wait for me to tell you that I did it before moving on to the next step.

 Sure! For this virtual experiment, we will be combining baking soda and vinegar to observe the chemical reaction that occurs. This reaction is a classic example of an acid-base reaction, which is characterized by the production of a salt and water. The baking soda, or sodium bicarbonate, is a base, while the vinegar, or acetic acid, is an acid. When the two substances are mixed together, they react to neutralize each other, producing carbon dioxide gas and water.

To begin the experiment, you will need the following materials:

- Baking soda
- Vinegar
- Measuring spoons
- A small bowl or cup
- A spoon
- A timer (optional)

Now, for the first step of the experiment:

1. Measure out 1 teaspoon of baking soda and pour it into the small bowl or cup.

Once you have completed this step, let me know and we can move on to the next step.

 OK, I did it.

 Great! Now that you have measured out the baking soda, we can move on to the next step:

2. Measure out 1/2 cup of vinegar and pour it into a separate container.

Once you have completed this step, let me know and we can move on to the next step.

 OK, done.

 Excellent! Now that you have measured out the vinegar, we can move on to the next step:

3. Carefully pour the vinegar into the bowl or cup with the baking soda. Observe the reaction that occurs as the two substances combine. You should see bubbles of carbon dioxide gas being produced and the mixture may start to foam.

While you are observing the reaction, you should also record any observations that you make. For example, you could note the color of the mixture, the amount of foam that is produced, and any changes in temperature that you observe.

Once you have completed this step and made your observations, let me know and we can move on to the next step.



Yeah, I did it. It bubbled up and fizzed. It was really cool.



That's great to hear! The reaction between baking soda and vinegar is always an exciting one to watch.

Since the reaction is now complete, there are no more steps to follow. However, you may want to consider conducting some additional tests to further explore the properties of this chemical reaction. For example, you could try using different amounts of baking soda and vinegar, or you could try using different types of vinegar to see how they affect the reaction.

I hope this virtual experiment was helpful and that you enjoyed learning about the chemical reaction between baking soda and vinegar! If you have any more questions or want to continue exploring chemistry, just let me know.



When the ingredients mix and cause a reaction is it really hot and can I eat it?



The reaction between baking soda and vinegar usually does not produce a significant amount of heat, so the mixture should not be hot to the touch. However, it is important to note that the reaction does produce carbon dioxide gas, which can cause the mixture to foam and expand. This can be especially true if a large amount of baking soda is used in proportion to the vinegar.

As for whether or not the mixture is safe to eat, it is generally not recommended to consume the products of a chemical reaction. While the mixture of baking soda and vinegar is not toxic, it is not meant for consumption and may not taste very good. It is always best to use chemicals for their intended purposes and to follow proper safety precautions when handling them.

This is just a simple example but again it can be improved and modified based on your desires and creativity. The possibilities are endless. Additionally, notice the enthusiasm, and ability to answer any question about the experiment. This would also work with scenarios and general thought experiments.

Benefits: This is another type of active hands-on implementation that can also be a fun and interesting as well as motivational way to expose students to the topic content. Engaging students by having them go through an experiment like this while also talking to the AI can enhance overall interaction. An additional benefit is that this process will continue to develop students' critical thinking awareness and AI literacy.

Research Assistant: ChatGPT can be used as a research assistant in many different ways. It can provide general help to begin with, such as brainstorming or giving a starting point as to who or what research to look into.

Prompt: I'm researching motivation in education. What are some key researchers in that field?

ChatGPT response to Prompt:



There are many researchers who have made significant contributions to the field of motivation in education. Some notable figures include:



1. Edward L. Deci - American psychologist who is known for his work on self-determination theory and the role of intrinsic motivation in learning and behavior.
2. Carol S. Dweck - American psychologist who is known for her work on the concept of mindset and the influence of beliefs about intelligence on motivation and achievement.
3. Richard M. Ryan - American psychologist who is known for his work on self-determination theory and the role of basic psychological needs in motivation.
4. Albert Bandura - Canadian-born American psychologist who is known for his work on social learning theory and the role of self-efficacy in motivation.
5. Daniel H. Pink - American author and speaker who is known for his work on motivation and the role of autonomy, mastery, and purpose in driving human behavior.
6. Mihaly Csikszentmihalyi - Hungarian-American psychologist who is known for his work on flow theory and the role of intrinsic motivation in peak performance and well-being.
7. Heidi Grant Halvorson - American social psychologist who is known for her work on motivation and the role of goals in achieving success.
8. Angela Duckworth - American psychologist and author who is known for her work on grit and the role of perseverance and passion in achievement.
9. Kenneth G. Barron - British educational psychologist who is known for his work on self-determination theory and the role of basic psychological needs in motivation.
10. Vivien Gibbs - British educational psychologist who is known for her work on motivation and the role of self-determination in learning.

Again, this is just a sample of some notable researchers in the field of motivation in education, and there are many other individuals who have made important contributions to this area of study.

It can review text such as survey comments and find patterns/themes. I personally tried it with my end-of-course evaluations and it was able to successfully find themes regarding students' responses to open-ended questions. It can also help with research by answering questions regarding different subject matter, how to conduct research, ethical considerations (informed consent, etc.), and how to format research hypotheses and questions. It can also help in formatting text, organizing information and finding research articles (*note that ChatGPT is still improving and all citations and references should be double-checked for existence and accuracy*), and much more.

Benefits: Using AI to assist in research will quickly become the new normal because it is very effective and will save a lot of time. Critical thinking and verification must always play a role so helping students learn how to work with AI in preparing, conducting, analyzing, and writing about research is an important skill with many benefits.

Implementation ideas are a mixture of original ideas and suggestions from Anders (2022) and Watkins (2022). Many of the implementation ideas provided also have short video explanations available at: <https://www.youtube.com/@sovorel-EDU/videos>

Ethical Considerations

Plagiarism and Academic Dishonesty

Students commit plagiarism and academic dishonesty for many different reasons, the top five are generally considered to be 1) not being fully prepared and/or fear of failing, 2) not having enough time to complete assignments, 3) not fully understanding the material, 4) believing that others are cheating, 5) believing that cheating is acceptable, (Awdry & Ives, 2021; Javed, 2019; Lang, 2018; Verhoef & Coester, 2021). Regardless of the fact that ChatGPT can help address a lot of these issues (assist with studying, save time, helping to understand the material), some students will seek to use ChatGPT to simply do the homework for them and/or completely write an essay for them, so that they don't have to do the "work." Work is in parenthesis in that we in academia need to better realize and understand what we mean or accept as "work."

Jeffrey Young's EdSurge educational podcast presented an excellent real-world example in describing how a 16-year-old has already been using ChatGPT to write his essays. Notice the prompts he uses:

Prompt: Write a 4 paragraph, 1000 word essay on the human nervous system.

ChatGPT Answer: completed essay provided

Prompt: Simplify all complex words.

ChatGPT Answer: reformatted result given

Prompt: Now, make it sounds like a sophomore in high school said it.

ChatGPT Answer: reformatted result given

Result: student received an "A" grade.

What "work" did the student do? He found and remembered a proper tool to use to create the product needed. He understood that the initial result wasn't fully

correct so he applied the system again, then analyzed the result, and modified it again. He evaluated the final created version and determined it was worth submitting.

Did this example assignment of "write an essay about the human nervous system" properly assess this student's ability to write an essay? Not in the classical sense, but it seems like it was still a very formative process because, if you noticed, he just went through the entire Bloom's Revised Taxonomy.

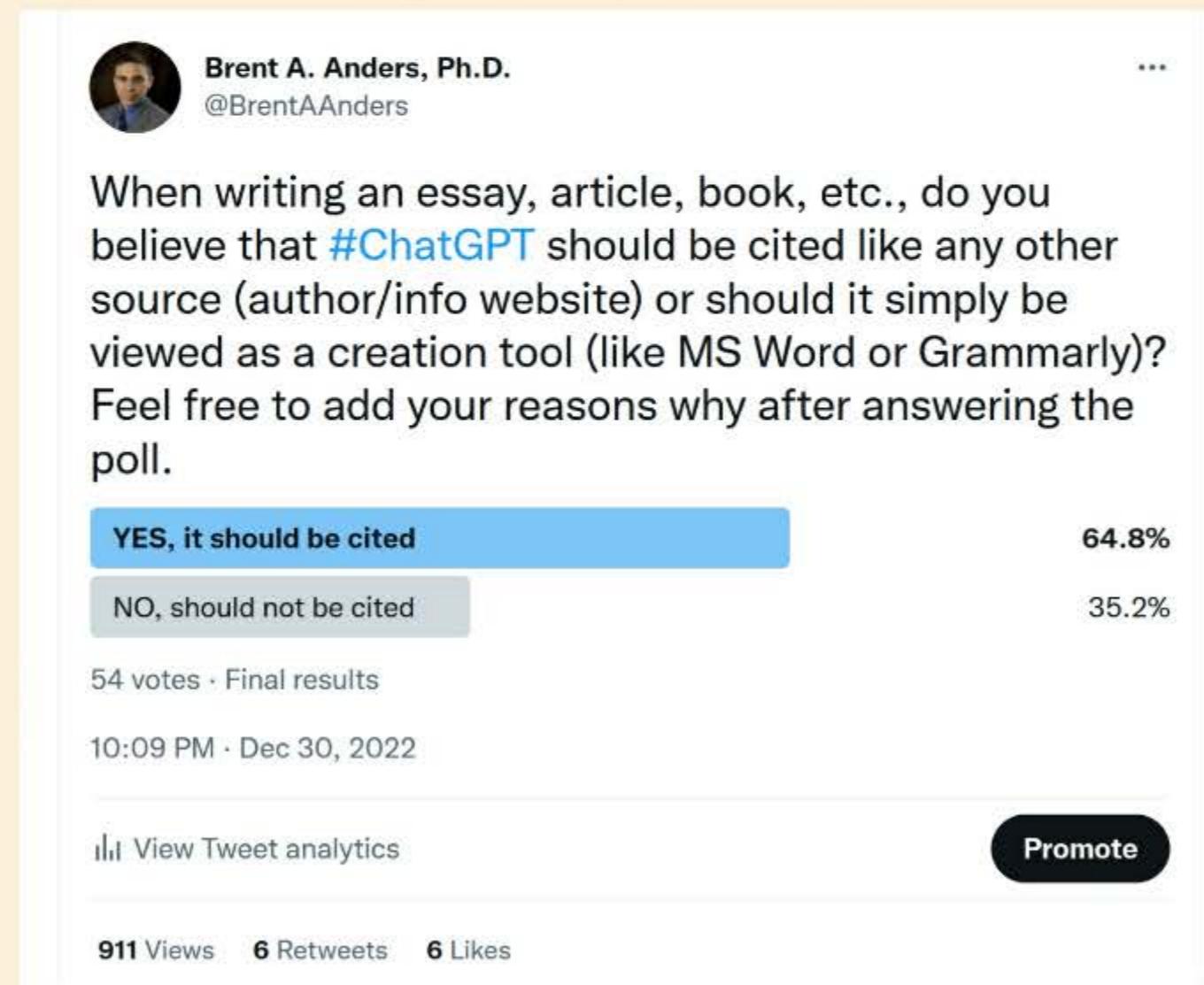


Bloom's Revised Taxonomy (Krathwohl & Anderson, 2001), original art by (Anders, 2021)

Academia must review what is being assessed and how is it being assessed. Does it make sense anymore? Is there some adjustment and adaptation that needs to

be made based on the new realities that new technologies have provided? One can't help but bring up the analogy of the calculator. Yes, we need to have a basic understanding of math and numbers, but we can do so much more with the calculator as a digital assistant. In the same way, we need to look at AI as a new, freely available and accessible tool, that students must know how to use, harness, and master in order to be effective, competitive, and a fully AI literate 21st-century student. These ethical, procedural, and pedagogical questions need to be addressed and answered.

In another bit of interesting perspective, I posed a simple vote to my Twitter audience (made up of mainly professors and educational professionals) asking if they believed writing created by ChatGPT should be cited:



The interesting part here is that there wasn't a consensus and many had mixed feeling about it as well. Is ChatGPT an entity that should be given credit and cited, or is it just a tool that helps put together text like Grammarly or tools with Microsoft Word (both of which are becoming more powerful as they continue to integrate greater amounts of AI)? These are important aspects of AI to contemplate in that this then affects educational policy.

AI Policy and Privacy Concerns

Educational Institutions' Policy on Use of AI

At the university where I work, just like at many universities throughout the world, we have a Student Code of Ethics that addresses academic integrity to specifically include plagiarism. Our code, similar to many others, currently reads "Plagiarism consists of using the words, ideas, concepts or data of another person without proper attribution" (AUA, 2015, para. 6.4.3). Notice the use of the word "person." Is an AI a "person" or not? I think many would say that a student would have somewhat of a defense if accused of plagiarism by stating that the content they used from the AI (like ChatGPT) was original text that was created through the effort of the student. That text (that would pass plagiarism software) would not exist if the student didn't "create" it by working with the AI system.

So what is the solution?

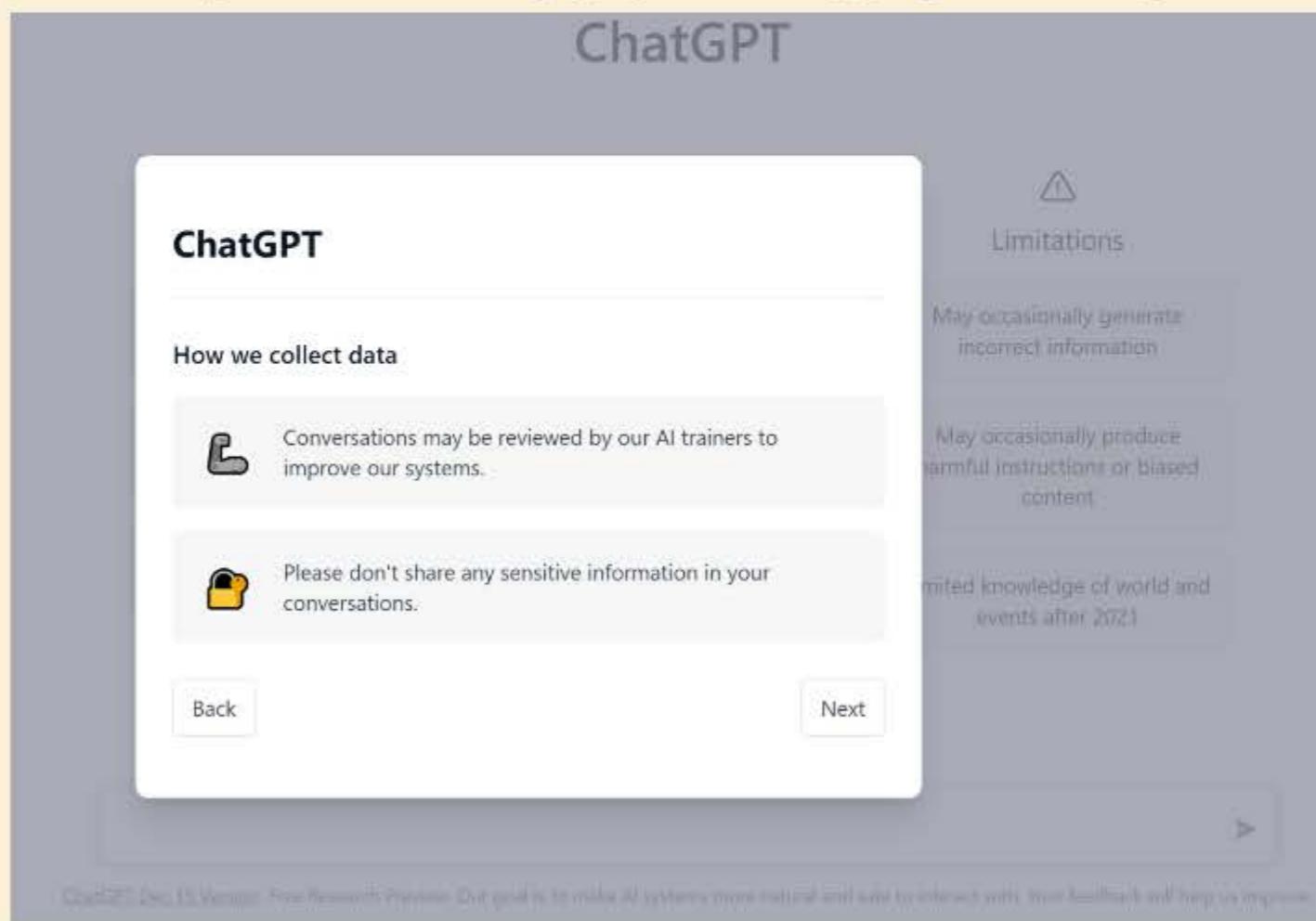
Rewriting the plagiarism statement as "Plagiarism consists of using the words, ideas, concepts or data of another person **or artificial intelligence (AI)** without proper attribution" could be used, but this quickly becomes problematic in that AI has been integrated into many different assistive systems. Will the use of Microsoft Word, Grammarly, or Google Docs be a violation now as well, since they incorporate AI to make grammar/syntax suggestions? Will students need to cite these systems? That seems really awkward in that everyone already expects documents to be written in Word or Google Docs.

An idea could be to require students to not necessarily cite AI as an entity/contributor but to make a statement that an AI, like ChatGPT, was used to assist in the creation of the document. Since advanced AI assistive tools are still somewhat novel, this would help provide transparency regarding how a document was created. This would additionally help address specifics in educational assignments and assessment processes.

Yet institutional policies are one thing, what about privacy concerns associated with using an AI system in general and using ChatGPT specifically?

Privacy Concerns

It is always important to protect minors and to fully inform the public on all aspects of privacy and how their data is being used. ChatGPT is upfront with this and as of 7 January 2023 has a large pop when logging in that expresses:



It also fully expresses its intended use of users' data for training since this is still the testing phase of ChatGPTs release (OpenAI ChatGPT Privacy Policy:

<https://openai.com/privacy>). Additionally, user input is connected and identifiable to users' accounts (not to others, just to OpenAI, done for security reasons to prevent people from continually violating their usage standards). To limit liability, OpenAI also states "Our Service is not directed to children who are under the age of 13" (OpenAI, 2023b, para. 6). There is an expectation that many of these privacy policies will change to be more in line with other companies (like Facebook, Instagram, etc.) once ChatGPT is out of its testing phase. These other companies allow one to adjust different privacy settings.

Teachers' Jobs Taken Over by AI

In the near future, it doesn't make sense that an AI would be able to take over a teacher/professor's job due to the many variables involved in *effective teaching and learning*. Many others in academia currently agree with me (Akinwalere & Ivanov, 2022; Kolchenko, 2018; Marr, 2022; Paratsii, 2021), but as technology advances so too might those views. I do see the world not needing as many tutors in that ChatGPT will be able to provide a lot of instructional assistance to any student in many ways and formats, all for free. Yet notice that I used the phrase *effective teaching and learning* regarding whether AI can replace human instructors.

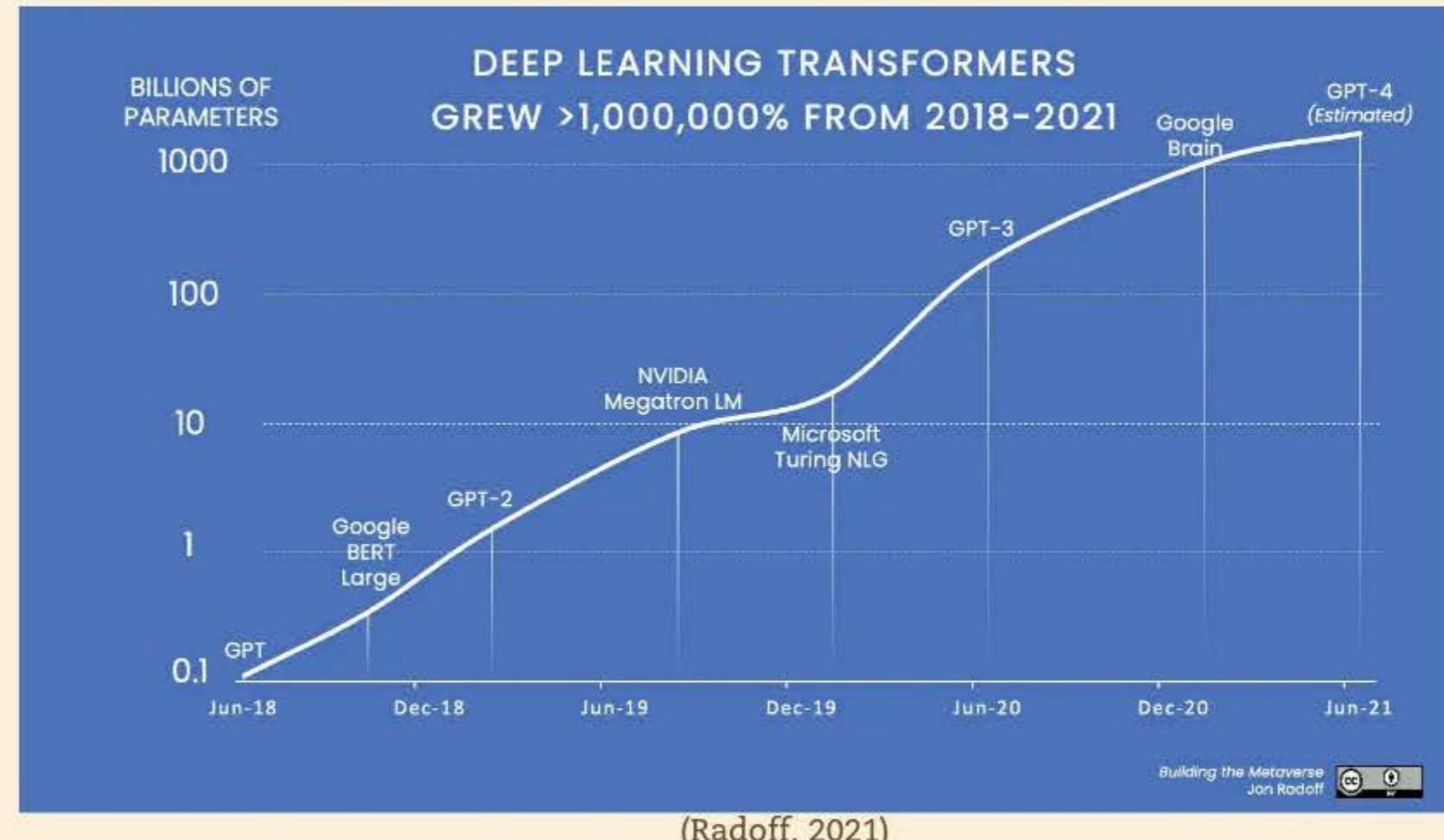
Given that we have already been in the "information age" since the late 1970s (IGI, 2022), educators should not be viewed as the keepers of knowledge but as subject matter experts. Experts in a given subject matter that guide students in understanding by building relationships, creating emotional connections to the instructional material, developing communities of inquiry, elaborating/discussing, maximizing engagement, motivating, providing opportunities to practice and apply skills, assessing in a developmental way, providing ongoing assistive feedback, and then assessing in a summative way. If teachers' or professors' classrooms do not look that way, then yes, they will be open to being completely taken over by AI tools such as ChatGPT sooner rather than later.

Faculty must also understand that they are essential in helping students develop much needed 21st-century soft skills (now also referred to as power skills) as identified in the MIT Human Skills Matrix (Ouellette et al., 2020). These soft/power skills are made up of: Thinking (critical/creative thinking, entrepreneurship, ethics, growth mindset), Interacting (communication, collaboration, empathy, negotiation), Managing Ourselves (self-awareness, accountability, adaptability, professionalism), and Leading (strategic vision, empowerment of others, project management). Many of these skills are also often referred to by employers as needed

skills in order for employees to be competitive (Marr, 2022c; Melnichuk, 2022). By being a vital part of the development of these skills within students, faculty will remain relevant and needed, even as AI continues to evolve and become much more integrated into the educational process.

Future of ChatGPT and AI

In talking about how fast AI has improved, Elon Musk gave a powerful and some might say either ominous or exciting quote about the future of AI development, “The rate of improvement from original GPT to GPT-3 is impressive. If this rate of improvement continues, GPT-5 or 6 could be indistinguishable from the smartest humans” (Musk, 2020). Note that this quote was in 2020. As of this writing (2023), GPT-4 is expected to be released later this year (Awan, 2022; Wiggers, 2022). Things are moving, developing, and evolving very quickly.



The fact that AI's capability grew by 1,000,000% in the last three years is staggering and must serve as a wake-up call to everyone. Everyone in academia (administrators, board of trustees, board members, teachers/professors, and all others involved) must understand that this is the new reality, not a fad, or something that will just go away on its own. There cannot be any hoping for it to go away or wishing for it to all blow over. We must address all of this head-on and learn to work with AI instead of opposing it. Knee-jerk reactions such as New York City

public schools' banning of ChatGPT (on 3 January 2023) from all school computers and Wi-Fi networks will not work (Shanklin, 2023). This type of reaction will do more harm than good and shows an overall lack of understanding or desire to evolve and improve the educational system and experience with powerful new freely available technology.

More Integration

The next logical step will be for ChatGPT to be integrated into search engine results. I see it functioning as an additional tool for search engines, not as a replacement. There are some reports that seem to indicate that Microsoft appears to be getting ready to do this with ChatGPT as well as Google with its own similar AI tools (Bass, 2023).

Additionally, I believe that future AIs, maybe even ChatGPT will integrate/combine capabilities with other AIs. By this I mean ChatGPT could gain the ability to create audio, images, or even video from text. The reverse could also be possible where an AI, like ChatGPT, could be given audio, image, or video and then provide a full description of that content.

This is Just the Beginning

There are many other AI systems already in existence that students have already been using and there are many more on their way (Lynn, 2022; Quach, 2022). Some examples of ChatGPT alternatives are: Cactus (https://d147.bubble.is/site/caktusai/caktus_student), Magic Write in Canva (<https://www.canva.com/newsroom/news/magic-write-ai-text-generator>), You.com (<https://you.com>), Write Sonic (<https://writesonic.com/>), Claude (<https://www.anthropic.com>) and others. Additionally, a lot of companies are working on creating different types of interfaces for AIs like ChatGPT for specific tasks or with different types of guardrails. Some will appear as new AIs but will just be ChatGPT with a new “skin.”

Call to Action

Given that advanced AI, such as ChatGPT, is here and will now forever be part of our existence, we must learn to work with AI to enhance our capabilities and lived experiences. Critical thinking is key to accomplishing this. We in academia must make AI literacy an integrated priority to ensure that students at all levels are fully aware of AI, understand it, can use it, and can harness its power in order to be more productive, effective, and capable. ChatGPT AI can provide many benefits to improve education by enhancing engagement, interaction, understanding, and

motivation. It can help both students and instructors to save time, lower stress, and create a more positive educational experience. Yet this can only happen if everyone in academia works together to enhance educational processes and pedagogical approaches. By properly using AI in the classroom we can help to develop more capable and enlightened citizens as well as more effective and skilled students ready to overcome research obstacles and compete in the realities of today's markets and industries.

Additional Resources

AI Guides (PDF):

1 Page Guide to ChatGPT in Education (PDF): https://drive.google.com/file/d/1fTtmGz2Cp2nd65mNfQzPyo3beWXc9j9m/view?fbclid=IwAR1ca03NIEONeb8vmgzmkfSRdqKh7UEF0QtCK2i3i1gX1xQ_FoR-c3m1StOc

Hands-On AI Projects for the Classroom: A Guide for Elementary Teachers (PDF): https://cdn.iste.org/www-root/Libraries/Documents%20&%20Files/Artificial%20Intelligence/AIGDK5_1120.pdf?ga=2.148833847.144812743.1667084241-758571551.1584477015

Websites:

Get Going (AI Prompt Sharing Community): <https://prompts.getgoing.ai>

Flow GPT (Trending Prompts): <https://flowgpt.com>

Sovorel Educational Blog: <http://sovorelpublishing.com>

AI Literacy: <https://www.netliteracy.org/ai-literacy>

Videos:

What might ChatGPT mean for higher education part 1 (Education Futurist Bryan Alexander Webinar): <https://youtu.be/Bz7aW6vStBw>

What might ChatGPT mean for higher education part 2 (Education Futurist Bryan Alexander Webinar): <https://youtu.be/gB6fM5TMp5c>

Sovorel Educational YouTube Channel: <https://www.youtube.com/@sovorel-EDU>

Short Videos about ChatGPT: <https://youtube.com/shorts/THsEFZ63-iM>

Webinar about ChatGPT: <https://youtu.be/lfwAXqpBbgI>

Glossary

AGI: Artificial General Intelligence. There is no fully agreed-upon definition but it is generally viewed as the ability to learn and think like a human regardless of environmental factors/limitations, to be human-like in dynamic reasoning, creative thought, analysis, realization, and awareness in general.

AI: "...systems or machines that mimic human intelligence to perform tasks and can iteratively improve themselves based on the information they collect" (Oracle, 2022, para. 1).

AI Literacy: The need for everyone (including instructors/teachers/professors and students) to realize that AI is all around them, know how to use/work with AI, know how to harness its capability and power, as well as to always use critical thinking and awareness with any AI result (fully understanding its data sources and methods).

Bloom's Revised Taxonomy: six distinct levels of cognitive learning per Bloom's Taxonomy revised to be 1) remembering, 2) understanding, 3) applying, 4) analyzing, 5) evaluating, and 6) creating. These different levels, generally viewed as lower level (1-3) and higher level (4-6), are used to help instructors develop student learning outcomes/objectives. See the image within this book for a visual representation.

Course Alignment: Also referred to as "structural alignment" is the proper alignment of key course components: student learning outcomes, assessment strategies, and instructional strategies (teaching activities/pedagogies) in order to make the best learning experience possible (Biggs, 2003).

ChatGPT: Stands for Chat Generative Pretrained Transformer. An AI assistant-type tool that can be interacted with through conversational English and is capable of answering virtually any question and create text as well as computer code in virtually any format.

Effective Teaching and Learning: Instructional experts in a given subject matter

that guide students in understanding by building relationships, creating emotional connections to the instructional material, developing communities of inquiry, elaborating/discussing, maximizing engagement, motivating, providing opportunities to practice and apply skills, assessing in a developmental way, providing ongoing assistive feedback, and then assessing in a summative way, to maximize the educational experience.

GPT: Generative Pretrained Transformer based on a Natural Language Processing Transformer (NLP). Developed by OpenAI.

GPT3: Generative Pretrained Transformer version 3, released in 2020. Based on a large neural network of 175 million synapses. Its release marked the first full implementation of an AI that could manipulate and create text at a level that was indistinguishable from a human's work (Gehles, 2021).

GPT3.5: Uses a combination of text and code published before Q4, 2021 (OpenAIb, 2022). "GPT-3.5 learned the relationships between sentences, words and parts of words by ingesting huge amounts of content from the web, including hundreds of thousands of Wikipedia entries, social media posts and news articles" (Wiggers, 2022, para. 3).

GPT4: Generative Pretrained Transformer version 4, set to be released in 2023. Expected to be at least 100 times more powerful/capable than GPT3 (Awan, 2022; Wiggers, 2022).

Hallucination: AI science term referring to when an AI might present information that is incorrect. The AI system can even express this incorrect information confidently, with falsely (hallucinated) created facts and/or citations.

Language Model: "Language modeling (LM) is the use of various statistical and probabilistic techniques to determine the probability of a given sequence of words occurring in a sentence. Language models analyze bodies of text data to provide a basis for their word predictions. They are used in natural language processing (NLP) applications, particularly ones that generate text as an output" (Lutkevich, 2022, para. 1).

OpenAI: This is a company focused on AI research and deployment. Their mission is to ensure that artificial general intelligence (AGI) benefits everyone, all of humanity, (OpenAI, 2023c). Current high-level investors include Microsoft, Reid Hoffman's charitable foundation, and Khosla Ventures.

OpenAI: This is a company focused on AI research and deployment. Their mission is to ensure that artificial general intelligence (AGI) benefits everyone, all of humanity, (OpenAI, 2023c). Current high-level investors include Microsoft, Reid Hoffman's charitable foundation, and Khosla Ventures.

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About the Author



Brent A. Anders, PhD., has worked in higher education for over twenty years, concentrating on digital media, communication, student interaction, and online instruction. Anders has extensively worked as an educational media consultant (video production, live webcasting, student experience / engagement, and instruc-

tional technology), a course developer/instructional designer, an educational author, and a lecturer.

Anders also served in the U.S. Army for over 25 years, first as an airborne infantryman, then as an international certificated military instructor with additional leadership positions. Anders personally trained hundreds of soldiers all over the world, retiring as a Sergeant Major while working with the U.S. Embassy in Armenia as part of the Kansas Army National Guard State Partnership Program.

Anders currently works at a major university in Armenia, (The American University of Armenia), as the Director of Institutional Research and Assessment, and the Center for Teaching and Learning. Anders also works as a lecturer instructing students from different majors. Anders authors books and research articles, does periodic international speaking events, and hosts a dedicated educational YouTube channel and blog: www.sovorelpublishing.com. For a full listing of Brent A. Anders' academic publications please visit <https://ksu.academia.edu/BrentAnders>

Feedback

Thank you very much for reading this special book. I hope it will directly help you to obtain and continually develop grit so that you can succeed in all of your endeavors.



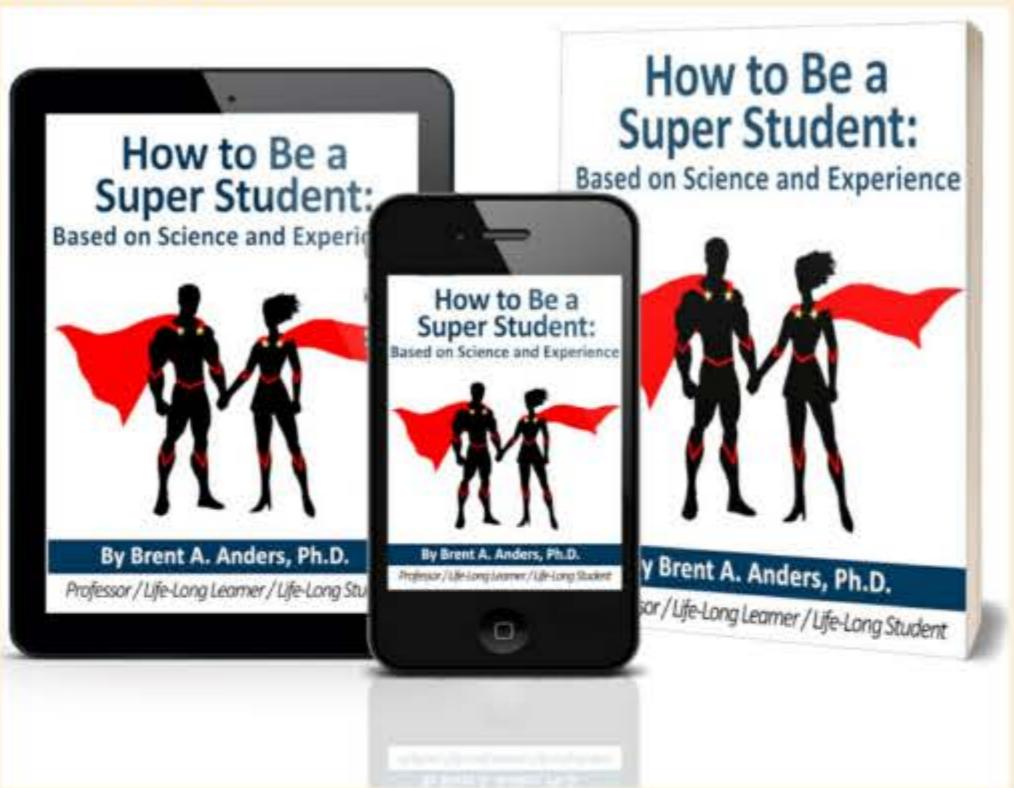
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Other Available Books



How to Be a Super Student: Based on Science and Experience, available on [Amazon](https://www.amazon.com/How-Be-Super-Student-Experience/dp/0998763756):
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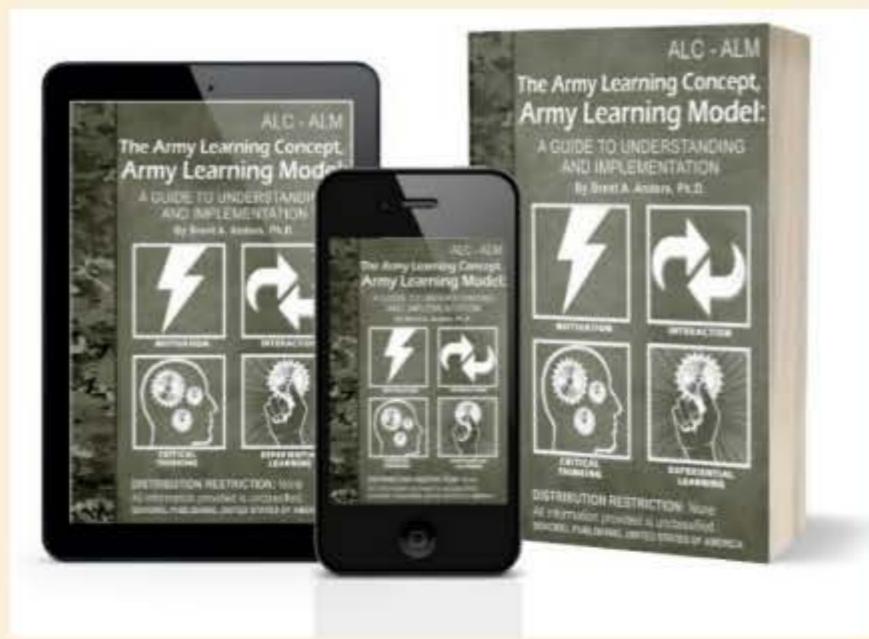
This powerful book unlocks all the secrets to truly being a Super Student. Professor and life-long learner Brent A. Anders, PhD., provides key insights from his many educational experiences both in higher education and as a retired military instructor, along with reflections made by his many students, and information learned from cutting-edge learning science research. Each one of the key concepts presented manifests as a new academic superpower to help ensure that you will thrive and succeed in all your academic pursuits.



Seven Characteristics of an Excellent Instructor: Based on Learning Science, available on [Amazon](https://www.amazon.com/Characteristics-Excellent-Instructor-Learning-Science-ebook/dp/B0839CXTLQ) (<https://www.amazon.com/Characteristics-Excellent-Instructor-Learning-Science-ebook/dp/B0839CXTLQ>)

This highly useful compact e-book presents the top seven characteristics of excellent instructors derived from over 50 scientific journals and resources (from 2000 to 2020).

Each characteristic is fully described, explained, and suggestions on how to develop these characteristics are provided to help all educational practitioners improve and become excellent instructors.



The Army Learning Concept, Army Learning Model: A Guide to Understanding and Implementation, available on [Amazon](https://www.amazon.com/Army-Learning-Concept-Model-Implementation/dp/0998763721) (<https://www.amazon.com/Army-Learning-Concept-Model-Implementation/dp/0998763721>)

This book is a powerful implementation guide to fully use and integrate the benefits of the Army Learning Concept (ALC), Army Learning Model (ALM).

Areas covered include improving interaction via enhanced instructional presence, enhanced instructional techniques and technologies such as virtual reality, reaching adult learners, Gen Zs, and everything in between.



How to Enhance Instructional Presence, available on [Amazon](https://www.amazon.com/gp/product/0998763713) (<https://www.amazon.com/gp/product/0998763713>)

This book deals with how to specifically make students feel more like a real learning member of an instructional community (of inquiry) and not “just a number.”

The book describes how strategic implementations of video can be used to enhance social, cognitive, and teaching presence to maximize instructional effectiveness, engagement, instructor approachableness, student achievement, and improve educational experiences.

Take a Walk with Me: How to Develop GRIT, a True Story

Soon to be available on [Amazon \(www.amazon.com\)](http://www.amazon.com). "Take a Walk with Me" will deal with the very important topic of grit. It is an interesting type of book because it presents grit through the lens of a true story about completing a 15-mile road march in the Army. It then breaks grit down into easy-to-understand components along with ways to develop grit within your own life.

"Take a Walk with Me" will provide a deep emotional understanding along with scientific references, all to create a roadmap to success. The power of grit is that it helps us succeed in learning, health/fitness, business, relationships, and all aspects of life. It is a vital component in helping us achieve our goals and true purpose in life.

Thank you for your support.

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