

## Webinar Transcript : Using AI as Assistive Technology to Support Executive Functions

Please join me in welcoming our presenter for the day, Doctor Todd Cunningham, who is a clinical and school psychologist, assistant professor, chair of the school and clinical child psychology program at the University of Toronto. His research investigates the support of students with learning disabilities. From assessment to interventions. Projects involve looking at new techniques and psychological assessments, evaluating assistive technology, professional development and literacy, and numeracy and tele psychology. So with that, I will hand everything over to our lovely presenter, Doctor Todd Cunningham. Todd, the floor is now yours.

Great. Thank you so much. And thank you very much to everybody who's allowing me to beam into their space today. Um, so my name is Todd Cunningham, and I am a professor here at the University of Toronto. I'm also a psychologist. And years ago, when when, uh, assistive technology. Well, for years now have been doing a lot of work in the area of assistive technology and evaluating the effectiveness of assistive technology, and, um, did that for a whole bunch of years and around 2012, 2015 assistive technology just kind of became boring. Same things over and over. We knew really what the main effective technologies out there. Text to speech was very effective for students who had word level reading challenges, such as in dyslexia or learning disabilities, in word reading. We knew that word prediction was very effective for students with who had difficulties with spelling related issues, and we knew the calculator was very effective for students who had basic computational areas, which are. And then every all the other assistive technology. Yeah. Not as effective as we were hoping it to be. And that's kind of the way the place stayed for a long time, until November 2022. The AI really jumped up on the game. And today I really want to kind of talk to you how we're really thinking and seeing AI really as an assistive technology tool, um, to be able to facilitate the learning process, especially for those students who have executive functioning challenges and not seeing it as a tool to subvert learning, but really to enable learning to take place. Now, for many of us, when we think of artificial intelligence, we're really thinking of, you know, kind of ChatGPT when it really came on the market. But in fact, AI has been here for a long time. The algorithms in AI actually date back to the 60s, 1960s, when those initial AI algorithms had been being built. But we've actually been interacting with AI for a very long time. Um, for me, I remember one of my early experiences of thinking about AI was a situation with my youngest daughter, Rachel.

This is Rachel today, an awesome ten year old. But Rachel, when she was two, was going through a phase where she always wanted to know when her birthday was. How many more days till her birthday? Because, hey. Well, there's no better day in your life other than your birthday. You get, uh, it's all about you. You get all your family and friends to come over. People give you presents, and you get as much candy and cake and ice cream as one can have. Why wouldn't we want our birthday to be every single day? And so Rachel was at this point in her life where she was asking constantly, when's my birthday? When's my 30th? How many more days till my birthday? And as a parent, it started to get annoying. And so finally we started saying, Rachel, it's still it's it's a long time from now. It's a long time from now. And so one day, Rachel took it upon herself to get the answer that she wanted. She didn't like the fact that I was just dismissing her. She wanted to know what that answer was. And so she had seen us starting to

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use a new tool in her house. It was a Google Mini, and she saw that We would ask Google Mini lots of questions. We'd start off by the phrase Hey Google and then ask it a question and it gave an answer. So Rachel walked up to this. It was on top of her piano stand, on her top of the tippy toes and yelled, Hey Google, um, when is or how many days till August 29th? And Google gave an answer 148 and you could just see that excitement in her eyes like, oh my goodness, I got the answers. I did this on my own. I got the answer to my question. And then you saw this real sense of complex look on her face, a sense of puzzlement on her face, and then she got back up on her toes again and yelled, hey, Google, is that a long time for now? And had the concept of, uh, um, quantity down yet? But we've been using these AI devices for a long time. Word prediction in our smartphones. Our autocorrect uses AI types of algorithms voice recognition, Google searches. All of these have been using AI algorithms known as natural language processing models NLP. But they've just gotten to a point where they become another level of sophistication is what we're kind of seeing today. And that's kind of what we're moving into, is a new level of sophistication with our AI that is actually opened a new door of assistive technology for our students.

Now, just to remind the audience here, when I talk about assistive technology, I'm talking about any technology commercial, modified or customized that can assist, increase, maintain or improve the functioning capacity of an individual with a disability. So the great analogy always is the wheelchair. Um, before the wheelchair was developed, if I was paraplegic and I needed to get from point A to point B, I could either pull. Myself across the ground. Um, very, um, uh, very effortful, or I could have someone pick me up and move me from point A to point B, but that meant I was very dependent. I created the invention of the wheelchair comes across suddenly. I can get from point A to point B much more efficient, and I can be able to do it independent. And the wheelchair allowed for movement to be more accurate. And that's what we're looking for in terms of an assistive technology device. Assistive technology device is that technology that we use for a student who has a disability, where that disability or that weakness is preventing them from doing specific academic skills out there, and that technology, when we bring that technology in to help out with that academic skills, it's not fixing the academic skills. So when a computer reads aloud to a student in text to speech, it's not fixing their dyslexia or their reading disability. It's, um, it's not teaching them how to read, but it's circumventing it. It's a bypass tool to bypass that weakness, to allow them to go on so that when you look at their ability to do the larger work, their ability to read, they can do reading much more efficiently. It doesn't take they don't have to reread the same words over and over again. They can do that a lot more independent. They don't have a teacher or a peer or a parent read to them, and they're much more accurate. They know exactly what's being said on the page. And so that's the gold standard in which we look for when we're looking at, um, technology or any sort of technology to turn it into assistive technology, it has to be increased the accuracy, the efficiency and the independence of that student in doing the day to day activities that are expected for them within the classroom or at home or in the workplace. So when it comes to assistive technology or AI as assistive technology.

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The key area that we actually see AI coming into is in the area of executive functioning and attention, or I should say, actually attention and executive functioning. Now I'm just going to give a little background, because we need to understand what specific weaknesses we're going to deal with when we're talking about this. So first, our brains are complex. They're complex things and our brains are complex because they're so all these pieces are working together to be able to allow the brain to do what it does, and for our brains to be able to learn, for our brains to be able to inquire and engage in a learning environment or any environment, we have to have attention. And we have an intentional field that allows us to focus in on what's important and not focusing on everything else, because there's so much sensory information coming into me at any given time that I can't pay attention to all of it. I have to focus my cognitive resources, my attentional field onto what I need to do to be able to learn. As many of you right now are probably focusing your attention onto me as I'm talking to you. Some of you might be trying to do the divided attention thing, do another activity, get ready for dinner, or drive home as you're listening to me as well. You won't learn as much out of this because we know we're humans are very bad at doing divided attention.

So when it comes to attention, we're really talking about what is currently our brains focused in on so that it can actually absorb that information or be able to recall and use that information. And attention is governed by three main circuits alertness, the orienting and then the executive functioning system. Alertness is turning on the attentional system. This is where we get the system turned on without alertness. Orient. We can't orient it without orienting. We can't do executive functioning. So alertness is the foundation of it turning on the system. Now, students who have ADHD, they have difficulties with alertness. Their brains don't have enough dopamine in their brain. And so, um, when they're sitting in class and doing some work, it's not stimulating enough to generate enough dopamine so that they can turn on their attentional systems. Of course, with ADHD, if they go and do something fun that they like to do, well, that generates the dopamine and they can attend to that. But when they're doing activities that require that sustained attention, that aren't capturing that brain's excitement, then they have a hard time engaging in those environments because they can't turn on their attentional resources. But this can also be due to exhaustion. A lot of our teens are running into this. They're they're not going to bed at a good time, and they're waking up the next day unrested and coming to school and just yawning. Um, it can be done to due to new, um, poor nutrition or dehydration can impact this. A lot of things can go into impacting the attentional system, just not a student not being able to turn that on. And so what do we see them yawning their heads down on their desk. They're daydreaming, kind of looking out into the other world. The second part of the attention is orienting. This is our ability to be able to switch our attentional field onto what's important and not pay attention to other things around. So your ability to pay to me and not to kind of whatever else is happening in your environment right now. Now, students who are very anxious have mental health challenges, who have high level of anxieties. They have a hard time orienting because they have a lot of worried thoughts running through their brains. And so therefore they're paying attention to those worry thoughts, and they're not paying attention to

the person or the teacher in front of them. Or if you have a lot of trauma in your life, you are very hypervigilant.

So you're constantly seeking out, you're orienting towards trauma or trauma or a threat might be coming. So you have a hard time being able to orientate yourself to what's going on, or you have your smartphone beside you, or you have pop ups on your computer going on, and all those things also pull the attentional resources away, and it makes it hard for us to orient ourselves, um, due to the orienting network. Um, so why cell phones being banned from schools is actually a really good thing. We know that our brains are wired to pay attention to important bits of information. Our orienting system turns wants us to check in on important bits of information. And when we have our cell phones close to us, that social media aspect, those notifications, we've trained our brains to think about those as being really important. And so we constantly want to orient ourselves to it. And there's been some good research that actually shows that because of that, students don't have the same attentional resources when they're in class, when their cell phones are next to them. The last system, then, is the executive functioning system, and the executive functioning system is the system about the planning, the organization, the prioritizing of information, the ability to shift tasks from one thing to another, ability to encode that information properly, and also to check ourselves, to monitor ourselves and how well we are doing. And again, these systems are all built on each other. So if one system is not working, then the other systems are not going to work. So attention alertness is out. Then orienting and executive functioning is out. If alertness is out then executive functioning is out. And then we can also have just specific executive functioning related issues in whatever the combination of these attentional networks that are problematic.

What we find often in the classroom is we find or at home is we find that students are not engaging in their work. We find that they are often given tasks and they don't know what to do. Even though you've just given a lecture, you've taught the class. They are often not getting the work completed in time. Um teachers are often finding that they're having to, uh, well, they're on on their cases, or parents are on their cases at home. These are often situations where parents are often find that they're getting in a fight with their, their, their, their children every single night saying, you know, you need to get this done. Do you have homework? Get back to your homework. So we're constantly seeing off task behaviors, a lot of off task behaviors. Now, if you talk to a lot of students who have, um, attention and executive functioning issues, often what they talk about is they just don't know what to do. They don't know what what they need to have accomplished. Um, and they and and they're kind of lost on on the next steps. Some students talk about seeing like the white screen of death in front of them. You know, they open up Google Docs or Microsoft Word and they have this assignment to do and they just don't know what to do. Um, other students, they might be in class and they might just start doodling and they think they're just doodling for a minute or two, but in fact, they're doing like for 45 minutes. They have no sense of time. Um, and how fast time is passing. This is the situation where we see that the area of I could actually start to come in to be able to help out with these students in being able to start to attend. How leveraging AI to start to be a tool that can help

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students with organization. Looking at math, looking at research, reading, written expression, looking at a bunch of these different areas, I can suddenly be a tool that can kind of help a student go from stuck to start to engage in the work that they have to do, and we can do that. We can use that in two different ways. I can come in two different ways. We have our chat bots out there, which is like our chat bots and our co-pilots that students can turn on and start to type their stuff into.

Or we can have our apps, which are kind of AI infused tools that have some more safeguards on them, but still allow students to use the tools to kind of get started. So let me kind of show you how this what this looks like in terms of the way that we can start to use AI as one of these tools. And I'm actually going to do this live, just kind of show you. I'm going to use, um, chat Microsoft Copilot as my AI tool. And the reason I'm going to use Microsoft Copilot as my AI is it is one that many of the school boards in Ontario are moving towards as a kind of approved AI tool. The reason that copilot is getting kind of approved by many large institutes is copilot has a guarantee that it's not going to record your information. It's not going to gather your information and use it later on. And we always know that because we have this kind of green check box up here, that that that's happening, this shield with the check box, that's the indication that it's not gathering other AI tools like ChatGPT Magic School and that it's always gathering your information. Anything private goes in there. They've grabbed it. So, um, copilot is a great tool because it allows us to ensure that it's a safe environment in which our students are working, um, within. So the student is in class, and you are providing them with an assignment to kind of be able to get it. And of course, the students looking at this and goes, I don't have a clue what to do here. I don't know what I am supposed to do with this assignment. And so I in what the student could do is the eye. They could just right into the eye what they wanted to do. So if I have an assignment on, let's say, how is my teachers giving an assignment on how is climate change changing? Um, um, how is climate change being impacted by CO2 levels? I can simply give I a prompt, um, write me a grade seven, um, essay on how climate change is being influenced influenced by CO2. And I is going to start to do that. It's going to start writing that up for them. And yes, it will do the students work and that is problematic. And that we tell students is cheating. We won't let them do that. So instead of that, what we want to do is start to teach them how to use this effectively.

So the student has this project that they have to do. They have to do this project on how climate change is, um, being impacted by CO2. So the student can download and put their, um, kind of their project into the bot. Um, and I can say upload a copy because the file. Okay, I'll use the previous copy of it. Oh come on. Sorry. And I can go. Um, now I can interact with it. Um. Please tell me the key thing that I need to do in this assignment. And it's going to kind of pull that up for for the student. Oh, okay. So here's the key thing. I need to, um, pick pick a partner. I need to research some topics. I need to collect some information, create a visual. Okay. Um, what is the goal of this assignment? And ask it that, and then it's going to kind of pull pull these pieces up. So suddenly, instead of asking the teacher 1,000,001 questions, I can just start asking the assignment. Those questions, I can start to interact with the assignment. Okay. Um, please,

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um, create a step by step guide on how to how to get this assignment completed. Um. Um, provide me with useful materials to complete um, each step. Oh. So it's going through and it's now going to create me a step by step guide. So the first step I have to do is pair up. Um, it's telling me what I need to do. Um, next thing is research the topics. Here's some things. Give me some websites that I could actually go to to be able to get some general information on, on that information. So collect collect that information. So again, instead of just being stuck and not knowing how I can start asking questions, start to interact with it, even take it a step further. A lot of times students have a hard time getting stuff done in the amount of time that we need them to get it done through, so I can ask it again. Um. Um. Please. Okay. Um, today is November 19th. I have to hand this this in on December 5th. Please create mini due dates for each of the steps in completing this assignment. Asked that, and now I'm going to have an updated thing with, um, due dates, um, built into my assignment. Oh, there it is. So I have those due dates now in there, so I can actually then use that. Now Copilot can't do this, but if as in ChatGPT that has some additional power to ChatGPT. What I could actually do is write a prompt that would allow me to then download this into Microsoft Outlook, into my Google Calendar. It would actually take all this information and export it into my calendar system for me to allow me to use it there. So the power of AI is getting really is amazing. So I went from a point where I have the white screen of death. I don't have a clue what to do. I've been able to start asking the computer some prompts.

By giving I mean asking some questions about my assignment to the computer. And now I'm starting to get a lot of information to know how I can be able to use this and engage with this information. So this becomes a very powerful tool, just helping me get started on the assignment. So now I'm on the assignment, I'm working on the assignment I'm doing doing some work to, to learn. Um, but but I need to kind of, um, Let's see. Um, I've looked at a bunch of websites. I got a lot of information from these websites, but I need to start to organize this work. And again, this is where we see a lot of students with AI or executive functioning challenges have a hard time. They have a hard time kind of getting their ideas in a good order. So now I'm going to go back to my tool and I'm going to now I've done my research, I'm going to ask you some more questions and help me out. So I'm going to start off by giving the the AI a persona. So this is an important when we're trying to get the AI to do specific tasks for us. So I want to say I want you to simulate a grade seven teacher in the area of science. I am going to, um, ask I'm going to provide you with, um, points Coins, and I want you to help me organize those points into an essay. Um, do you understand? And I put the do you understand command just so that it lets me know. Yes, I understood before I started doing it. So now I would kind of download a whole bunch of different points that I've researched on my essay. Um, in this case. So, um, Co two is going up. Um, this causes more wildfires. Um, the land is dry. Um, um, industry and cars are bad. It's just some basic points here and now it's going to go in and start to organize that. For me now it's elaborated as well. So I need to go and keep interacting with this. I don't want just to take this at face value. I need to interact and play with these pieces. Um, and, and again, it allows me to do that so I can keep working and working with this AI tool to kind of help me move towards a

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point of getting that, um, final piece that I'm looking for. Another thing that I might run into is editing. Editing is really hard. So even as I kind of get this kind of AI, um, as the computer is helping me to elaborate and fill in on on these different pieces, I might finally hit a point where I just I need to edit the work. And so again, this is where I can come in to be able to help me out. I can actually give it a piece of my writing to me, um, to it, and it will be able to go through and help to, um, correct and work on my, my writing. So let me just grab some very poor writing that I am going to dump into the I. Move this window. Um. Okay, here it goes. Very bad piece of writing. And I'm going to ask I to kind of clean it up for, um. Me. This one's on Mars. So again, I'm going to change.

I'm going to start my window over again, and I'm going to say, I want you to simulate a expert writing coach. I am going to give you some of my writing. Please edit it for spelling and grammar. I do not want you to change the ideas in the the passage. Do you understand? It will check that it's actually understanding. Okay. That's great. When I drop in my passage here and then let it go and edit that. And so now it's going to come back and it's going to give me the edited piece of work for me so that I have I have that. So this is a really powerful way by giving it the passage and giving again those commands. It's going to allow the tool to do exactly what I'm asking it to do. I want to just simply edit the work. I don't want you to change it. I just don't want you to do it. And this tool, this AI tool then becomes probably one of the most powerful tools that we have in terms of editing out there. So last year I had some of my research, um, students go in and play with, um, the um, basically put head to head, uh, Microsoft Copilot, um, ChatGPT another tool called um, uh, Quill Bot and Grammarly to see which is actually the better editing assistive technology out there. What we did is we took passages where only 19% of the work was written correctly. Um, or 67% of the work was written correctly. 84% of the work was was spelled correctly, or 93 was spelled correctly. And what we found was if we looked at Microsoft Word, you know, um, if, uh, 84 to 93% of the words were spelled correctly, then it was good at figuring out about 75% of those misspelled words.

However, if you jump over to ChatGPT um or copilot, um is copilot and ChatGPT use the same algorithm. We are at 100% for all of the categories. Um, better than Quillbot, better than Grammarly, like Grammarly if you are. If you're a really bad speller and you only can spell 19% of the words correctly, then it's only able to kind of get about 50% of the word spelled correctly when you use it. Recognize 50% of those words, whereas ChatGPT in that. No problem. Um, when we look at grammatical related issues. So again this is 60% of the passages were had no grammatical issues. Up to 99% of the passage had no grammatical issues. Um, Grammarly did very poorly on the second with a lot of the grammar issues out there, but ChatGPT or copilot no problems in what they're able to do. They were able to recognize and get it all the way across. And the third finding that we we came across is this ability to change the idea. So in my prompt, I had basically told the chatbot that I did not want it to change my ideas as I was going through. And that's important because again, when we use these tools, what we found is stuff like Quillbot and Grammarly. If you just let them go through and edit the work on its own, it actually starts to change the meaning of the documents as it's rewriting Writing those grammatical

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errors and the spelling errors. It's changing the overall meaning of the student. Whereas copilot and ChatGPT, they kept them very high, um, keeping those main ideas there so it didn't change the student's work. So in the end, what we found was AI's cool, but all AI is not made the same. There really is differences between AI and when it comes to writing. Therefore, we need to be very careful in helping students understand that we need to be using certain tools. We also need to give them the right prompts to ensure those tools are working out.

So organization is really one of the big places that we start to see AI coming in, giving it the assignment and then helping with the process of writing through that assignment. Now, as you can see, I'm using a lot of prompts here. I'm giving it prompts. I said there is another type of AI called apps. Let me just really quickly show you an AI app. This is called Quillbot. Quillbot is an AI infused app that helps out with the writing process. And I can go into let me just go into. I can go into Quillbot flow, and what will flow is going to allow me to do is I can start to indicate what type of project I'm doing. So I'm going to do a research project and I can put in what my topic is about. So I'm having to do, um, how, um, um, climate change is leading to more forest fires. And I can give it that information. And what this app's going to do now is it's going to create a kind of a general structure to what I want to be writing about. Um, and that way I can start to build. Now, it's not giving me the answer. So again, because this is an app, it has safeguards built onto it, I can't go and ask Quillbot to write me a full essay. It won't do that. What it will do is generate some ideas of where I can go off of. Now, I can see here, um, it's saying you probably want to start off with a brief introduction to what climate change is, or how climate change and overview of climate change and forest fires. Um, important to address the issues. Um, thesis statement. So it's giving me some pieces here.

Well, in fact, maybe I might not even understand what climate change is. I haven't done that research yet. So I can go and do the research aspect here, and I can ask for it to go and do basically a search, but it's going to do more than just a basic search. It's actually going go through and tailor build the findings based on specifically what I am looking for. And give me some, um, some, um, clips of what what was found. So here's the source it looked at, and here's the information that it pulled from that source that it feels is really relevant to me. Now, what's really cool is I can type that out, or if I simply insert that, it's actually going to footnote that for me to indicate that this is something that I have, um, pulled, pulled from another source and given me the footnote. I mean, the, um, the reference here. Otherwise I can go in here and I can view it. I can actually explore that website that it got me that information off of. And I can go and read the article if, if I want. Now, this is a very, um, academic articles. So, uh, most grade seven students would probably engage with this level of complexity, but by having the paraphraser here to kind of pull it apart, it is allowing me to have some interactions that way. So this becomes a nice way. Another thing that this, um, Quillbot does, again, putting on the safeguards, it won't write out a whole paragraph for me, but if I got stuck. So let's say I'm writing a paragraph. Um, um, fires are increasing due to um. Doing live presentations. So it's moving a little slow. Fires are increasing due to changes in climate patterns. And then I get stuck. I can hit my fire piece here, and it's going to generate some ideas for me to help me kind of think of some



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new ideas I might need to put next and come up with some lists. So again, if I get stuck, a really cool tool to kind of help me out and kind of becoming unstuck so I can move on at the very end of, um. Quillbot does have its editing tools in here.

However, as I showed in the previous slides, it's not the most effective editor. It does bring in a lot of errors into its editing, so we don't necessarily recommend it for the editing aspects of it. But in terms of a initial safeguard system to put some safeguards on the student using AI, this can be a very powerful tool. Another challenge that we often find with students who have, um, executive functioning systems is when they're presented with text, they get very overwhelmed with all the text that is in front of them. You know, they, um, They they they have a. Let me see. Grab a passage here. You know, the teacher gives them a passage that they need to read about. Um, and they go, oh my goodness, there's so much here. It all looks super important. I don't know what you know, what's important, what's what's not important. And therefore they become overwhelmed and then they don't do it. So again, I can use I to be able to help me out in this situation. Um, I want you to simulate a grade seven science, um, tutor. I am going to give you a passage. I want you to create a summary of that document.

Provide me with ten Key points that I should know from that document and provide me with, um, five key vocabulary words, um, with definitions that will help me to understand what, um, what is in the document. Do you understand? So give it the prompt. I grab my document. Now drop it in there. And let it go to town. And now it's going to start to do that. So it's going to create the great quick summary. Key points of what I'm going to be looking for. Some key vocabulary that I should learn. And this is a fantastic Tool to complement what we usually do in with reading comprehension. So reading comprehension generally me is made up of activating your prior knowledge, developing a purpose for understanding the purpose of why you're reading it. As you read through, you want to gather information, identify those key informations, record that information and then summarize what you have read. Um, this helps me with the activating of prior knowledge. Instead of going cold into that document, looking at this document and being completely overwhelmed by it, I now have a kind of a layout of this document, seeing those summary key ideas and also some vocabulary that I should know to be able to help out. This is also really good for teachers. Before you give documents to students to be able to read. Having just creating something like this for all students is very, very helpful. Or another thing for our English language learners, this vocabulary piece is really, really important. And in fact, what we can do is ask it to, um, you know, put it, um, put a document in and ask it to actually develop a list of keywords that a student should know to be able to interact with that. And then you can also ask it to kind of be able to change the level of difficulty. So I could say, um, please, um, rewrite the first page at a grade four level, um, in terms of vocabulary and sentence complexity, um, but keep the main ideas. And now it's going to read it and it's going to do that.

So now I can do what's called scalable English where I can actually scale the level of difficulty of a of this document so that the students are gaining still those key concepts that I'm looking for, but they're not being overwhelmed by the academic language or just the overall amount of information that that is sitting there. So AI is very powerful as it comes into these,

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these areas. Another big problem that we often see with students with executive functioning difficulties is in the area of just general organization. Um, now this is kind of a bit of a and getting being productive. So often what we find is students are sitting around and they're just not getting a lot of stuff done. They don't have a lot of time on tasks. They're wasting a lot of time. Now, another tool that one can start off by using is a program called Rescue Timer. This is a wonderful tool, and what it does is track all of the, um, time you're spending on different screens and compile it together, and it gives you a score of how productive you are on a daily things, and it tells you what you're doing, where you're spending your time, and it'll actually break it down to the different tasks and also to the minutes of where, how you're spending your time on those different tasks. So it actually shows you how you're using your time with, um, often with students, with executive functioning. We give this tool to them and we just tell them to use it in the background just to gather this information of how they're especially when they're homework, how they're how they're spending their time. Then what we can do is we can export that information. We can actually get a complete reference of all the time that they're spent, plus the time of days. And we can input this into chat, I mean, into copilot, and we can ask it to first analyze this data and then create a schedule for that student. Create a schedule of how their day should be looking. Break. Break the day down so that they know when they should be taking breaks. When they should be doing other types of work. And then we can actually ask it to create a daytime, like a schedule for the week for, for the student and put in all the information that they need to be paying attention to, and it will generate that. And what's fascinating is we started doing this with students.

So we used the hops program, homework organization, planning strategies program for students with executive functioning to help them to develop homework plans and break um, but when we brought the I in to along with that, suddenly what students were doing is being much more interactive. Instead of waiting for one of the coaches to help them out, or getting mad at their parents and teachers for kind of trying to impose their wills on them, they would go back and actually interact with with the tool to be able to customize their own plans. And then they tracked it. They would actually track the information and see, did my scores change? Did my scores change as I was using this kind of technology? So this became another really powerful tool in terms of helping out with students as they start to move through their days, creating schedules and getting the work done. Now, the problem with all this is I'm showing you is you're probably saying, oh my goodness, Todd, there is no way my students will have the sophistication to be able to create these types of prompts to actually talk in this way that you are talking to the computer. And you're right, it's not. Developing prompts is actually a bit of a science. There's a real science there in terms of developing their prompts, in terms of the prompt science, just for you to know, there are four key things that every good prompt needs to have to really kind of get AI to do what we want AI to do. The first part of a prompt is you need to kind of create that persona. So I want you to simulate is a really important kind of phrase, because in doing that, you're basically setting the AI algorithm to know what kind of environment or what kind of person you want it to take on the persona of how do you want what you want to do? The second

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thing is you need to give it a task. What are you going to accomplish? I want you to summarize. I want you to create a schedule for. I want you to create a lesson plan for it. You need to give it a specific task in which you want it to be able to complete. Next thing is, you have to give it context so it knows what it's working around. And then in the end, you can give it what kind of format you want. Do you want in bullet points? Do you want it as a document? You want to have it as a table. You need to kind of give it kind of that overall format. What you want. So any good prompt kind of is comprised of these elements. And if you comprise it of these elements, then what you are able to do is get the tool to be very efficient in terms of providing what you want.

So here is a prompt. You are a grade six classroom teacher in Ontario. Draft a weekly email to students caregivers. So here is the persona. Here's the task. Here is the context of what I want and you want. And here's this. Limit this to an open, um, open, um, greeting with bullet points. Um, and I can take that prompt. Now, I can go back to my copilot and drop that prompt in starting a new chat. Always say make it blank. Hit it and it's going to carry out that task. So instead of me having to sit down and try and write this thing out, to send out my to my, to the community and really think about all the wording and all that I can have. I create that first draft and now I can, you know, edit this page or copy and put it in Microsoft Word or thing, edit the work that I have in here to customize it more, but it really reduces that first draft, that heart, you know, just getting myself going. Um, so that I can get this information done the same way that you can use those prompts to do it. We've developed, um, prompt cards for students. So when a student, instead of having to know and memorize all the prompts, we have kind of prompt cards that we have developed that students can go in and customize the prompts so that they can get the AI to do what they are looking for. It all, all the kind of the pieces are built in there so that AI will take on, you know, the persona, identify the specific informations the student goes in and customize these these prompts for specifically what they want to do. But this is a great way to help students to start to first interact with these tools so that they are beginning to engage in the process. So overall, when it comes to AI, what what we're really seeing is, yeah, I could do the work for the student. They definitely can go in and type type in, in um type in the um, it and it will generate the essay for them. But what we actually want to do with AI is we really want them to start to learn the process on doing this. We want to actually use AI in the way that they would use a classroom teacher by asking questions, getting guidance around something. Um, so that they have this kind of tool sitting beside them that allows them to be more independent, allows them to be more efficient in using their time to get tasks completed, allows them to kind of have a higher accuracy in their task completion. Um, and by doing that, then really the I for students who have executive functioning challenges really then becomes the assistive technology for them. It really does meet those goals of being a technology that works around an area of difficulties, that executive functioning piece and allows them to be independent, efficient and more accurate.

Now, the last piece I'm going to say before I over question, there's always a cautionary tale and alertness to this. The first thing is that AI is biased. It is based on Western Internet. And so if you're just asking it a general question, it's going to give you a Western slant to the answer

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of that question. Um, so again, students have to know how to be able to use the technology to get in. The second thing is it's not always right. Students still need to read and check and make sure what is being written or what they're researching. Like they need to corroborate it. It's not to do all the tasks for them. It's to assist them with doing those tasks. It's not necessarily to it's not going to. They can't just have AI generate them a bibliography list and then go look up those ideas. There are going to have to still do research skills. They still have to develop those other skills. It's just this help can help facilitate them being able to do it. It's not perfect. It doesn't give you the right answer all the time. In fact, it gives you the most common answer. The first time we got this AI tool we wrote in was the definition of learning disability, and it brought up an older definition of what a learning disability was. So it definitely wasn't. It's not a perfect tool in that way. Um, the other thing is we always tell students, if you're using AI, your teachers always have the right to question you and ask you questions on what you're handing in. Because really, when we hand something in that is a reflection of my demonstration of the learning that has taken place for me. I'm handing in a writing thing as a demonstration of what I have learned along the way. And so teachers should always have the right to ask you questions about what you have written or what you have handed in. And if you can't have it, if you can't answer those questions, then it's likely the teacher is going to think that you have cheated and just use the AI to write this. So you have to ensure that you can be able to answer questions about what you have done.

And if you go through the process of using AI as a tool to actually do the research, help you organize your ideas, write, edit the work. If you actually use it as a tool to facilitate the process of learning, then it's going to work for you and you're going to be able to answer those questions because you've actually engaged in the learning process. You haven't just stared at the white screen of death. You've engaged in that learning process. But teachers always have the right to be able to question question you. And the last warning is never. If you're not using copilot in a locked environment, never give it anything personal because it is grabbing all that information. So with that being said, our hope is with using AI now as an effective technology that more students are able to engage, go off to college and university, and parents can kiss their kids goodbye instead of having to worry that, am I going to be having to help my child all the way through college or university to get their work done? Thank you. Amazing. Well, thank you for that, doctor Todd Cunningham and sharing all those new ideas with us. I have been monitoring the chat and the Q&A, but if people still have any questions, please keep writing them in and I will try to get to as many as I can. We don't have a ton of time left, but I will try to touch on the major themes here. I'm seeing basically three major themes. The first is oh my God, it's cheating and I totally understand that instinct. I would love to have a time machine and go back to math class when the abacus was invented, and see the teachers freak out about that, because it is. It's a new tool and we're still not sure how to use it. And I always use the analogy, um, you know, I can give you a hammer and you can build something beautiful or you can bash someone else over the head. It's a tool. How we use it is a choice. So what would you say to the teachers that are having a really hard time wrapping their head around this idea that AI can be used as

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something other than cheating? So first I can cheat for the student as I showed you. It will write you the essay. It will do that.

But again, what we have to do is think about, okay, so when we're handing in a piece of writing, when the students handing in a piece of writing or doing a project, what are what is the summative evaluation that we're trying to get out of that? And the main summative evaluation typically is what the that we're using that writing as a way to demonstrate that the student has acquired some knowledge or has developed a skill. And and that's where I can help out. For students who have executive functioning challenges, typically they don't engage in the work. They can't get the work done, they can't get started. The homework piles up. And so therefore nothing's happening. So now we have a tool. And again we have to teach the students how to use these tools. Right. We have to teach them the prompts and what they how, what they should be able to do and what they can't do with it. Um, just like when we introduced the internet to to students out there, we had to teach them internet safety and how to write effective search and queries and what are good websites and not good websites. Same thing we're going to have to do with this tool. We really have to think about how to help them to understand the process of learning and facilitating the process of learning, um, that otherwise they wouldn't be able to do without it. And so that's the key thing for me when I think about I, I'm really thinking about when that product is coming in and I has touched that product. Has the students still learned that information? And I tell all my students at university in master's and doctoral programs, you can use AI, but I always reserve the right to question you on anything you hand in because I want to collaborate or validate that you actually know that information.

And so that's the big piece that we need to kind of switch our our thinking about the product itself is not necessarily the goal of the assignment. The goal of the assignment is to bring about a certain learning of certain materials for that student. The end product that they give you is this kind of a final piece of of what what's being displayed. And therefore, um, let's let's not just evaluate that. Let's evaluate the overall learning that has taken place. Wonderful. Um, so the second theme I kind of see coming through these questions, and you also saw coming, uh, was my students couldn't handle this. Uh, the particular teacher here is saying my grade seven students with ADHD also have LDs. They would never be able to do it at this level. And you touched a little on that with your prompts. But what else can we do to support students who are using these tools. Yeah. So so again so there's two main avenues you can do. You have the open chat bots and then you have the apps. And for some of the students who are very new to this or have a lot of comorbid challenges, then the app might be a better way. It creates all the safeguards. It's giving you step by step instructions on what to do and kind of, um, and how to move through it versus the open chat bots. Now the open chat bots are way more powerful. They can do a million more things in them than the apps can do, but the apps for some students is a really good place to start off. For a lot of students we're working with, we start off with Quillbot as that app for writing to help with the general organization and beginning of the writing process.

But what we're finding is, as students quickly kind of get a sense of it, and as we

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introduce, um, the prompts and help them to learn how to write the prompts, then the chat bots become much more important. The other thing that we have to remember is a lot of the times for students with executive functioning and other learning disabilities, they actually don't know the process to go through in terms of doing research. They haven't developed the critical thinking skills because they've always been paying attention to the spelling, the word, reading, basic numeric operations. They haven't developed that next level of skills that is required. And so we have to directly teach those skills to them. So if we're teaching writing, we're using self-regulatory strategy development framework to be able to help to teach the ability to plan, organize, write, edit, review. And then alongside we can bring in an AI tool and help them to learn how to use that it that I as an At tool effectively to help move through those different stages of of the writing process.

So again, we can't just drop in from in front of them and expect them to be able to do it. Really it is helping to facilitate a learning process along the way. And the prompt cards are, we're finding, very effective in helping students get from zero to at least started in that process. Yeah, I think that's a great tool. We always say, you know, cards like that, checklists step by steps have that printed out next to the computer. As the students are working on this it can be a huge help. Huge. Uh, so the last sort of theme I'm seeing is how do we know we can trust AI? You know, if the example given here was the teacher asked the chatbot to take a piece of writing that was written for grade 12 and sort of tone it down for grade five students. How do we know they're actually doing that? Well. Um, that we always have to check AI is a tool. It is not going to be 100%. And it's not perfect. And therefore it always takes a human to do it. I would never expect a student to hand in something that I has edited or done anything with, without having using text to speech and having the computer read out loud to them what is actually on the screen and what's actually been reading. They have. You always have to double check and you also have to use, you know, know the content area. So sometimes what happens is I will have a glitch and it will pull up the wrong piece of information as I gave with the example. So again a good researcher is not going to just use one piece of information. They're just going to use they want to corroborate or corroborate. They need to look for three pieces of information that all are saying the same thing. These are things that we want to teach students anyhow. I never expect the students just to read one article and expect that to be their only source of reference. I want them to know that they have to look at multiple references to make sure that they're all saying the same thing. So we're doing the same thing. Never have had AI touch something and never look at it again and hand it in. Always takes a teacher. Always takes a student or someone else to read over.

Look at it to ensure that in fact, it is done what we've asked it to do. Very well said. We are a little bit over time, but just really quickly. You used the phrase do you understand when talking to copilot? What if it says no? What do you do then? Luckily. Um. What? What does. Do you understand? What you see is it makes it has it write out what it thinks it it needs to do. Now I have my own learning disability. You can see my spelling was atrocious. As horrific as I was typing into Copilot tonight. Um, but it understands it for the most part. You know, it figures out

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what I'm trying to write because, again, it's using some pretty sophisticated algorithms in the background. But I always do that. Do you understand? And look at what it wrote out to make sure that, yes, it actually understood the instructions that I just gave it. Now I can overlay my assistive technology on it so I can have copilot there. And I could use my text to speech program either like read and write or natural reader, or the built in text to speech program into my operating system and have that text read out loud. So if I can't read what I, um, what AI has generated, um, another program can read it, read it to me. But yeah, it's always important that do you understand allows me to know that that it gives me the gives it reechoes back what it expects to do based on the prompt that I gave it. So it's just about a fail safe kind of situation.

Awesome. Well, with that, we don't have any more time for questions, so I will have to finish it off for tonight. But if you do have additional questions going forward, LD at school is always here for you, so feel free to email us at any time. Info at LD@School.ca. Find us on Twitter using the hashtag #LDwebinar or our handle @LDatSchool and we try to answer every question we receive. So on behalf of the LDatSchool team, I'd like to once again thank Doctor Todd Cunningham for sharing his brilliant mind and his time with us tonight, and thank the participants who took the time this evening to join us. Please remember, we'll be sending out the presentation slides and a short survey tomorrow as well as you will be the first to know when the webinar recording is completed and available on our website. And with that, I just thank you one last time and hope you have a great rest of your evening and stay safe out there. All right.

Thank you.