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Generative AI for Inclusive Education: Supporting Students with Disabilities Through Universal Design for Learning

Marie Sakowicz
University of Maryland, Baltimore County, USA

Foad Hamidi
University of Maryland, Baltimore County, USA

ABSTRACT

Special educators face challenges managing the time and resources needed to teach students with diverse needs. Creating individualized instructional materials that align with the needs and plans of each student is one of these challenges. In this qualitative study, we investigated how generative Artificial Intelligence (AI) tools can assist special educators in creating learning content tailored to the needs of students with disabilities within the framework of Universal Design for Learning (UDL). Understanding how special educators can utilize generative AI tools to create personalized learning content can inform future technology design and form the basis for developing professional development tools that support the effective use and adoption of these emerging technologies.

Keywords: Accessibility, Generative Artificial Intelligence, Special Education, Universal Design for Learning

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INTRODUCTION

Approximately 7.5 million students with disabilities were in public schools in the United States during the 2022-2023 school year, according to the National Center for Education Statistics (NCES, 2024). In the US special education system, these students need a diagnosis and a formal educational plan to receive services, referred to as an Individualized Educational Program (IEP) (*U.S. Department of Education, 2025*). The student will have measurable academic and/or functional goals tailored to the plan that teachers and their support team must follow. Special educators face challenges in creating individualized instructional material that aligns with the needs and plans of each of their students. Additionally, special educators must align their lessons with the Standard Core Curriculum for the grade levels they teach (Common Core State Standards Initiative, 2024). The Standard Core Curriculum is a set of educational standards in English Language Arts and Mathematics that outline what students should learn in each grade to ensure consistency and readiness for the next level. Generative Artificial Intelligence (AI) tools can assist special educators in this process by creating individualized and adaptive content tailored to the needs of students with disabilities.

Generative AI tools can adapt content delivery, provide multiple engagement options, and offer students various ways to express understanding and learning, aligning with the principles of Universal Design for Learning (UDL) (Shireesha & Jeevan, 2024). UDL provides a framework for alternative ways to demonstrate learning, making it more equitable, accessible, and meaningful (*Song et al., 2024*; *CAST, 2025*). Generative AI tools can assist with tasks such as developing learning materials aligned with the core curriculum, providing various teaching methods, and offering assessment strategies. Furthermore, incorporating the principles of UDL into AI-generated content provides more personalized, flexible, and accessible learning opportunities for students with disabilities and diverse learning needs (*Song et al., 2024*). Understanding the role of generative AI tools and UDL in creating inclusive educational environments is important for ensuring students with disabilities have diverse opportunities to engage with content and to express and demonstrate their learning.

There is a gap in understanding how generative AI tools can be used in special education to create personalized learning content to meet the needs of students with disabilities. Our study aims to address this gap by providing insights into how special educators can personalize content for their students with generative AI tools through the lens of UDL. Students with disabilities such as dyslexia, autism, or visual impairments benefit from content presented in multiple formats. Incorporating the UDL principles into AI-generated content allows students with disabilities more ways, based on their needs and strengths, to communicate understanding aligned with their Individualized Education Program (IEP) goals.

We aimed to answer the research question: What are the current and potential uses of generative AI tools for supporting special educators in creating learning content for students with disabilities, particularly within a Universal Design for Learning (UDL) framework?

This study contributes to emerging research in human-computer interaction (HCI), artificial intelligence (AI), and special education by exploring how special educators use generative AI to create learning content that aligns with the principles of UDL to meet diverse student needs. These contributions are relevant not only to educators and administrators concerned with the accessibility and inclusivity of learning technologies but also to technology designers aiming to create tools for students with diverse learning needs.

LITERATURE REVIEW

AI-enabled technologies provide new opportunities for teachers and students. Research has shown that AI-enabled technologies can create personalized learning experiences, provide feedback to students, and tailor content to specific students and their needs (*Celik et al., 2023; Chen et al., 2022; Chiu et al., 2023; Marino et al., 2023; Hopcan et al., 2023*). Educators find the use of AI-enabled technologies helpful in tailoring their lesson content, delivery, and communication methods based on the learning styles and needs of their students (*Chiu et al., 2023; Chen et al., 2020; Marino et al., 2023; Kasinidou et al., 2024*). Especially in special education contexts, AI-enabled technologies can assist in diagnosing and evaluating students with special needs and tailor the content for them (*Bah & Artaria, 2020*). AI-enabled technologies can also track student development and create interventions (*Mehta et al., 2023*). AI-enabled assistive technologies, such as speech recognition, speech synthesizers, and dictation applications, also play a critical role in special education to make learning more accessible (*Bah & Artaria, 2020*; *Marino et al., 2023*). However, there are some obstacles to overcome with AI-enabled technologies for students with disabilities or special learning needs. Not all AI-enabled technologies designed for educational use meet the needs of all students (*Chiu et al., 2023; Mehta et al., 2023*). For example, some disabilities prevent students from interacting with computer user interfaces without accessibility options. Another challenge is that there may be bias in the data used to train the AI model, and certain groups of students may be excluded (*Mehta et al., 2023*). Cost may be another obstacle to using AI-enabled tools in special education environments (*Marino et al., 2023*). Specific tools for special education may not be economical for school systems, as the population using them is smaller. Although previous research shows that AI-enabled technologies provide personalized learning and adaptive support, improvements are needed to make them more equitable and accessible to students in special education settings.

AI-enabled applications can tailor learning content to meet diverse student needs and provide targeted support through interactive and adaptive platforms (*Marino et al., 2023; Hopcan et al., 2023*). These applications provide a customized self-paced learning experience that satisfies the needs and abilities of students with disabilities (*Marino et al., 2023*). More specifically, AI-enabled technologies can support students with disabilities in literacy, language education, and skill development, giving them access to a relevant and quality education (*Bah & Artaria, 2020*). AI-enabled technologies can also help special educators with "creating classroom environment, role modeling, mentoring and nurturing, listening and looking out signs of discomfort, controlling, prompting, being a resource, assessor, organizer, participant; and tutor" (*Bah & Artaria, 2020*). AI-enabled technologies such as intelligent tutoring systems, augmented reality, virtual reality, and robotics can also support learning for students with disabilities (*Hopcan et al., 2023*). AI-enabled tutoring systems can personalize learning for students with disabilities by adapting to their abilities, preferences, and progress (*Marino et al., 2023; Shireesha & Jeevan, 2024*). The integration of predictive analytics, machine learning, and natural language processing in these AI-enabled technologies provides the ability to give real-time feedback and target gaps to make learning more inclusive (*Shireesha & Jeevan, 2024*). Although AI-enabled technologies have many benefits for student learning, more research is needed to identify the benefits and impacts on the "social, emotional, and behavioral development" of students with disabilities (*Hopcan et al., 2023*). AI-enabled tools can adapt instruction to the individual needs and preferences of students with disabilities, improve accessibility, and promote more inclusive learning environments if properly implemented in special education classrooms.

According to the research, AI-enabled technologies can also help improve communication for students with disabilities. In one study, AI-enabled technologies were used to examine which communication strategies between teachers and students increased social and educational outcomes for students with autism (*Lampos et al., 2021*). The AI-enabled technologies were able to identify which visual and physical prompts had a positive impact on the students. They posited that having access to this information can help teachers tailor their communication strategy for specific students. Although AI-enabled technologies can support the learning experiences of students with disabilities, there have also been serious concerns about the use of digital technologies. The use of AI-enabled technologies for teaching students with disabilities, especially cognitive disabilities such as autism, often undermines student autonomy and privileges the needs and desires of technology designers, teachers, and administrators (*Spiel et al., 2019; Marino et al., 2023*). The use of AI-enabled technologies might amplify this issue due to their ability to track activities and performance more aggressively. This underscores the need for ethical and accessible AI-enabled technologies that meet the needs of students with disabilities and do not cause them harm.

Although the previous research points to promising possibilities for AI-enabled technologies in educational contexts, there is still a need to better understand the experiences of use from both students and teachers. Reflecting these perspectives early in designing AI-enabled technologies for use in special education will help avoid disappointment or harm through their use as this becomes more widespread and prevalent. In our research, we used UDL as a lens to examine how generative AI tools can support special education teachers. UDL builds on the Universal Design (UD) approach that originated in architecture and identified seven design principles to make spaces accessible to diverse users (*Center for Universal Design, 1997; Burgstahler & Cory, 2010*). These principles include equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use. UD is widely applied to create accessible spaces, tools, and experiences, including learning experiences (*Hall et al., 2015*). UDL builds on UD by providing a framework structured around the following three educational design principles (*Meyer et al., 2014; Hall et al., 2015; CAST, 2022*):

- Multiple Means of Representation: Presenting information in different formats (e.g., text, visuals, auditory) to help engage and maintain learner interests.
- Multiple Means of Action and Expression: Learning content that engages students with diverse identities, perspectives, and narratives and allows them to demonstrate their understanding in various ways.
- Multiple Means of Engagement: Learning that fosters engagement through different forms of communication and different forms of expression to build more accessible, inclusive spaces and systems.

The principles of UDL advocate for providing multiple options for students to receive and express understanding of information (*CAST, 2022*; *Center for Universal Design*, *1997*). This can be through visual and auditory information, having multiple ways to express knowledge and skill acquisition, and having access to various methods to motivate and sustain participation in learning activities. UDL has previously been found to be particularly effective in structuring the design of accessible online learning courses and resources (*Dell et al, 2015; Seok et al., 2018*). Incorporating UDL when creating learning content with generative AI may present promising opportunities to enhance accessibility and offer more personalized learning pathways for students with disabilities.

RESEARCH METHOD

To understand how generative AI tools can aid in content creation to address the diverse needs of special education students, we conducted a qualitative study (*Merriam & Tisdell, 2016*) with special educators. There were two parts to this qualitative study. First, we conducted a focus group with four special educators in December 2024. Then, in February 2025, we held a follow-up co-design

session with one of the participants from the focus group. The goal of the focus group was to understand how special educators use or would like to use generative AI to create personalized content for students with disabilities through the lens of UDL. The goal of the follow-up co-design session was to collaborate on the design of a generative AI application that would assist special educators with a specific task to meet student needs. A focus group was selected because it promotes collaboration, interactive discussions, and idea generation in a small group setting (*Merriam & Tisdell, 2016*). Co-design was selected for the follow-up session because it allowed for a more focused discussion to build on initial thoughts and ideas from the focus group on a generative AI tool that could meet the needs and challenges of special educators.

Table 1

Demographic Characteristics of Participants

Number	Gender	Grade Level(s)	Disabilities of Students	Subject(s)	Previous use of Generative AI
P1	Female	4th -5th	Autism, intellectual disabilities, multiple disabilities, specific learning disorders, and other health impairments	All subjects	Yes
P2	Female	Various levels	Reading issues and math issues	Reading and Math	Yes
P3	Female	PK -2nd	Autism and developmental delays	Early intervention	Yes
P4	Female	6th -8th	Communication and behavior needs	Academic life skills, ELA, social studies	Yes

Participants

Special educators who work with students with disabilities were the population for this study. We used convenience and snowball sampling to recruit participants for the focus group (*Merriam & Tisdell, 2016*). Convenience and snowball sampling were chosen to obtain special educators' specific experience and knowledge, and to take advantage of the availability and willingness of participants we knew in our professional networks. The initial participant for the focus group was recruited from a previous study. To recruit more participants, an IRB-approved flyer was posted on a Facebook (*Meta, 2024*) group for special educators, and snowball sampling was used to get the final participant. We recruited four participants for the focus group. Three participants were special

educators in public schools in the eastern United States at the time of the study. The fourth participant was a semi-retired special educator who performed contract work and saw private clients. All participants were women, but since most special educators in the United States are women, this is representative of the target population (*Data USA, 2025*). P1 was also selected later for the follow-up co-design session due to her experience, knowledge, and insights provided during the focus group session. Table 1 includes the participant information.

The focus group was conducted on Cisco Webex (*Cisco, 2024*) and lasted about 90 minutes. Before the focus group, each participant received read-ahead material with AI definitions and UDL principles. The read-ahead document listed AI concepts and definitions from the Google AI for Educators online course (*Google, 2024*). The AI terms defined in the document were Generative AI, Conversational AI, Machine Learning (ML), and Large Language Models (LLMs). The three UDL 3.0 themes listed on cast.org (*CAST, 2022*) were provided to ensure they were considered in the AI-generated lesson plans developed during the focus group. The document also provided a prompt format from the Google AI for Educators online course (*Google, 2024*) to be used as a starting point for creating a lesson plan in a generative AI tool during the focus group.

The focus group participants collaborated on creating a lesson plan using UDL principles with two generative AI tools. The tools demoed and used for the session were OpenAI's ChatGPT (*OpenAI, 2023*) and Anthropic's Claude (*Anthropic, 2024*). The participants engaged in collaborative brainstorming while using the two generative AI tools to generate lesson plans for students with disabilities during the session. This allowed the participants time to experiment and consider other ways to utilize generative AI to support students with disabilities in their daily practice. The group used an iterative approach to test the capabilities of the generative AI tools. The participants began by creating a lesson for early elementary-aged students with autism to support reading comprehension. As the tool responded, the group continued to prompt it to refine the lesson to meet the objectives and goals. The participants also brainstormed about adding accommodations for specific student disabilities during the session. Examples of questions we asked participants during the focus group included:

> *"Have you used AI-enabled applications in your practice previously? If yes, please elaborate,"* and *"Would you be interested in using this application in your classroom? If yes, how would you use it?"*
>
> The participants also shared ideas about how they would like to incorporate generative AI tools into their practice.
> The follow-up co-design session with P1 lasted one hour. The co-design session consisted of two parts. During the first part, we asked the participants several questions about the findings from the focus group.

Some examples were: *"Have you received any feedback from your students on any lessons you have created with ChatGPT?"*, *"Have you utilized generative AI to modify a lesson for a specific disability?"* and *"Do you feel generative AI tools could be used for other teachers and students to help advocate for themselves?"*

During the second part of the co-design session, we discussed the design of a potential future tool that P1 would like to use in her classroom. We used several prompts to facilitate discussion, which included:

"Imagine if there is an AI-enabled application that we could create to help your practice (e.g., lesson planning), what kind of features would you like it to have?" and *"How would this tool support creating multiple representations for a lesson?"*

The data collected was reviewed and analyzed to ensure accuracy and identify themes (*Merriam & Tisdell, 2016*). The first author reviewed the transcripts against the recordings to ensure they matched. Once the transcripts were reviewed and edited to match the recording, they were imported into NVivo (*Nvivo, 2024*) for qualitative data analysis. Thematic analysis was performed in NVivo to identify the sessions' main themes and categorize the data (*Merriam & Tisdell, 2016*). Seven themes were identified from the data, and participant quotes were organized under these themes in the NVivo application. After the first author completed the initial round of coding, the codes were reviewed and refined by the second author. Both authors agreed upon the final codes.

RESULTS

Use of generative AI to create personalized learning content

The first finding from the focus group was the various ways special educators expressed that generative AI tools could help them refine learning content to support literacy instruction for their students. The participants shared ideas and details of how they could solve some of the problems with reading comprehension using generative AI. During the lesson creation activity, P3 suggested an interesting way that generative AI could help students understand a story, saying,

"All of my students right now are working on reading comprehension objectives, so answering WH [who, what, when, where] questions about a story, like sequencing events, retelling. That's a big one right now. I haven't tried it yet in ChatGPT, but it's something that I was hoping to either break it down with or get an idea of different ways. I think my kids are kind of bored with the current way that I'm presenting it."

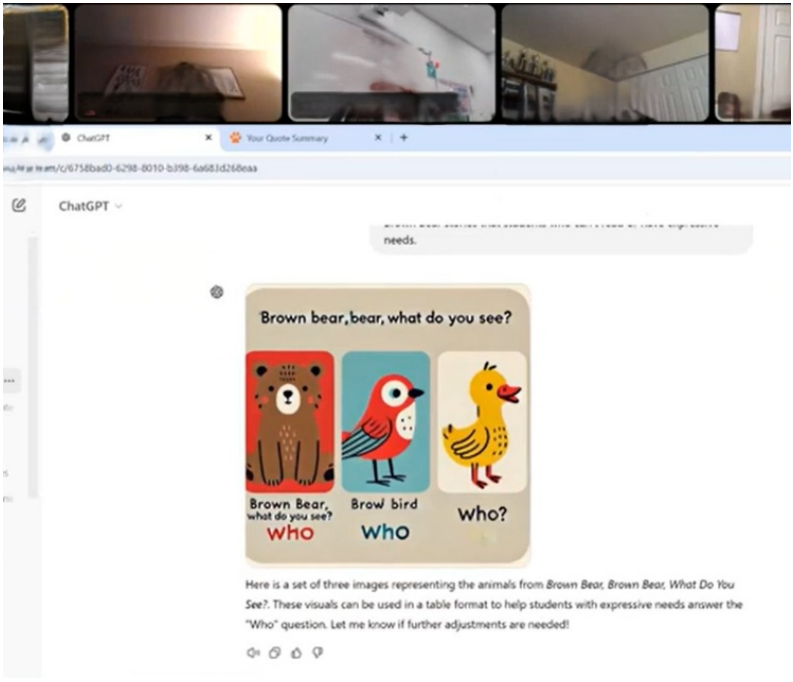
P4 was also interested in comprehension and continued with additional questions asking if generative AI could help create graphic organizers for individual students. She said,

> *"I'm interested in figuring out phonics [a way to improve reading and spelling skills by teaching the relationship between letters and sounds] stuff, and then I'm also [interested in] making individualized graphic organizers just because of a couple of my students have to do the written language goals and they're within the IEP goals. They're allowed to have like sentence starters and so they can do more fill-in-the-blank type work, but I'm wondering if ChatGPT can help make specific graphic organizers on specific content."*

The group worked through some prompts to create a graphic organizer to support a particular story in the chatbot. The chatbot created a graphic organizer with a table of three pictures, which the students could choose from for the lesson.

Figure 1

Focus Group Session generating a graphic organizer for a story.



P4 also asked about a modification to add more images to the text for a student who needed visual aids. She said,

> *"They [some students] get pictures to accompany their answer choices, so like [when] we're asking about who, there's a picture to accompany the text, because not all my students can read. So, is that an example of different modifications and accommodations you're talking [about], but is that something [generative AI] can do?"*

P1 agreed that this approach can be used to support *"students who can't read or have expressive issues or like expressive needs."* She similarly described how images of specific items, depending on the lesson (e.g., animals), can be generated and added to content using prompts. These quotes illustrate how the participants considered ways in which generative AI could create individualized content for some of their students, tailored to their specific needs and skill levels.

P1 described how she prepares for teaching by uploading the curriculum to ChatGPT to generate learning content aligned with the curriculum that she can incorporate in her lesson planning during the co-design session. She said,

> *"I just have more materials for them to have access to. I have more sentence frames [a partial sentence with blanks for students to fill words in] available and more visuals because ChatGPT could be like 'this is the thing that you need to make, this is how you should lay it out...' Whereas it might take me 45 min to decide how to lay out images the best way, but ChatGPT will kind of be like this is what the bridge [used in language learning to organize similar elements together] should look like and this is why, all your verbs are together and all of these are together."*

This quote explained how ChatGPT saves her time when lesson planning by providing her suggestions on sentence frames, bridges, or ways to structure visual aids to help students with English Language Arts activities.

P1 also shared that she had been using generative AI, especially ChatGPT, regularly in her classroom and that she liked it very much. She shared a large number of different tasks for which she used it. The table below summarizes the ways that P1 and other participants mentioned they have used or potentially would use generative AI in their practices.

Table 2
Suggested areas and uses of generative AI for special educators

Lesson Planning	Evaluation	Administrative
instructional materials	answer keys	report writing
idea generation	quizzes	remove biases in writing
incorporating preferred characters	rubrics	IEP writing
visual supports	compare text to rubrics	email writing
math concept review	report card comments	lookup information
create memes	collect data on students	understand teaching skills
concept reinforcement with images	sort data into categories	supplementary aids and services
read aloud activities		
educational rap songs		
math problems		
short stories		
slide content		
align IEP goals to common core standards		
generate sentence starters		
modeling or role playing activities		
create lesson or learning objectives		
modifications for physical disabilities		
manipulatives		

Use of generative AI to create accommodations or modifications for disabilities

We found that generative AI was used to modify learning content to meet certain disabilities. P3 mentioned how generative AI could also support teachers working with blind and low-vision students. She said,

> *"There's a teacher that I'm trying to support who has students with a lot of vision needs, like CVI [Cerebral Visual Impairment] and blindness. I know that she really struggles with trying to come up with lessons that reach that particular population, and then trying to find ways to modify it, like create materials. ... This would be potentially helpful. She tries to do a lot of tactile activities. So trying to come up with ways to incorporate more tactile activities versus picture-based and then trying to find material substitutions for maybe like, adapting a book. Using more hands-on different texture things and she's trying to come up with all these different materials and what [each] could look like, and I think you probably have*

to get very specific with the prompts, but maybe it would cut down some time for her."

In this quote, P3 was thinking about students with visual impairments and how it is harder to find ways to accommodate lessons for them. She was brainstorming how generative AI could be prompted to provide more tactile accommodations for lessons so that teachers could better engage students with visual impairments.

Describing a way to personalize content generation for students with autism, P2 shared how she saw value in using generative AI for modeling behavior for them and stated, *"I can see how it can be so useful, especially for children with autism, creating a video to model certain behavior for them would be... very valuable."* Here, she linked the ability to generate multimedia content with chatbots to creating customized videos that cater to the specific needs of students with autism, helping them learn how to achieve their goals.

P1 mentioned how she uses it to interface with her students' assistive technologies (i.e., augmentative and alternative communication devices), she said,

"I also really like that with assistive technology, I find it to be very helpful, and like generating what words I even need to put into my students' devices, because oftentimes I'm scrambling last second, ten minutes before the lesson to be like, oh shoot, do you have 'sun' in your device? Did I forget to check? I did forget. I always forget to check."

In this quote, P1 described how she must manually load the words related to an upcoming lesson on student devices so that they can participate in activities, but she often forgets until the last minute. Identifying and loading these words for a lesson can be time-consuming, and she finds that using generative AI to aid her in adding specific words to her student's assistive technology devices has saved her time.

P3 also shared another way she envisioned using generative AI in the future, saying, *"I was thinking about the data collection piece of it and also looking at rubrics and task analyses for students."*

In general, these findings suggest that special education teachers can consider several ways in which the use of generative AI chatbots can save them time by tailoring learning content, generating images and videos, or providing accommodations for specific student needs. Generative AI chatbots can also provide teachers with additional content to use with their students, which is especially beneficial in special education, given the diverse range of student abilities.

Use of generative AI for student Individualized Education Program (IEP) goal tracking

Our participants shared that an area of promise for the use of AI-enabled technologies in special education classrooms is the creation and tracking of Individualized Education Program (IEP) goals. Monitoring progress is important for each student who has an IEP. In the focus group session, P1 mentioned she would like generative AI to help her with IEP goal generation and tracking. She said,

> *"Something that I wish existed in the world of AI is that if I picked the common core standard [for the students grade level], it would then generate the IEP [Individualized Education Program] goal from it, that [it] had all the components [for that element], and it would then show me what the year before should be in the IEP goal with the data tracker and then what the next years would be with the data tracker, for the rest of the kids' existence. ... So, I didn't have to think about it. Also, moving up in progression and getting more complicated, and adjusting to align with the most tested common core standards."*

This quote describes how P1 envisioned an application that could automatically align all the common core standards for the student's grade level to their IEP goals. She also would like the application to show what standards and goals the student had the previous year and what the standards are for the next year as well. That way she could tell if the student was progressing based on what their goals were and will be in the future.

P3 agreed that it would be helpful if generative AI could help to lay out the plan for the topics and skills students needed to learn throughout the school year and the order in which they needed to be taught. She said, *"I agree. I think that'd be really helpful having kind of like a long-term scope and sequence aligned to the curriculum..."* She continued on to also state that having it adjust the plan for each student by saying, *"...differentiate for students..."* and also working backwards to figure out the steps or lessons needed to reach their goals by saying, *"...back-mapping where needed."*. In these quotes, both P1 and P3 expressed how using generative AI to create specialized learning content and to lay out the lessons each student needs to achieve their goals is something they would be able to benefit from. Using generative AI for these tasks would also help ensure that learning goals are accessible for each student.

During the follow-up co-design session, P1 shared details of how she had started using ChatGPT to help track her student's IEP goals and align them to common core standards. When describing how she uses ChatGPT to create learning material to meet student social, emotional, and friendship IEP goals, she said,

"I have a couple of kids with Behavioral Intervention Plans [specific plan to address and help reduce challenging behaviors], so I'm using it to track their data in a slightly different way. I took their behavior goals and then I just readjusted the tracker [paper or electronic method of documenting behavior and progress of the student] that we had from the district to revamp it in a different way using ChatGPT."

She went on to further describe some of the specific prompts she used to make student goal aligned lesson objectives with ChatGPT by saying, *"...put in an objective, make it student friendly, make a language objective, make it connect to common core standards, make it have X Y Z parts."* She also provided more prompts that she has used for the creation of a learning activity with ChatGPT, by saying,

"For a teacher model [add] a 'we do', where we practice together, and then a 'you do', where students work independently section, make it have adaptations for AT devices, make it have scaffolded questioning for whatever based on X Y and Z, and then put it in a graph."

To finish off the discussion of that lesson content preparation that aligned with the students' IEP goals, she described how she has learned to prompt ChatGPT to create specialized learning content based on the students' abilities and goals. She said, *"Then I said footnote the IEP goals at the bottom, and so it was able to do that, and then also added in ways of assessment data so that you could track it."*

P1 shared an additional idea that she had but did not test out in ChatGPT by saying,

"And then I haven't done this yet, but my next step was to actually make the assessments for the lessons that they kind of outlined so that I could kind of look at what that looks or kind of more think through more about what that would look like using ChatGPT to collect some data based on the student IEP goals."

P1 also discussed during the co-design session how she uses ChatGPT to efficiently adapt the curriculum to meet the needs or goals of her students. She stated,

"I do a lot of it for my reading curriculum, specifically for the reading intervention curriculum, because it's pretty dry and we do the same thing every day. Which is good, because we need the routines and we need to know that's how they know how to operate within the curriculum, but it's

not accessible for my friends [way of referring to students with a specific need] who use the AT devices and it's not accessible to some of my friends who are very busy, and those kind of things."

The above findings and quotes show that using generative AI to assist with the creation of IEP goals and aligning class content to these goals can save special educators time, provide individualized content modifications, and assist in students' progress.

Use of generative AI to aid with alternate ways to demonstrate learning

Our study found that the use of Universal Design for Learning principles with ChatGPT has worked to make learning content more accessible for diverse learning needs. To explore this we asked P1 during the co-design session if she specifically uses ChatGPT to apply UDL principles when creating lessons, and she said,

"I have found [ChatGPT useful] to do UDL and quote UDL by itself, especially when I say differentiate [adjustment for a specific student] for kinesthetic learners or [apply the] multiple means of communication or whatever [task] I'm looking for at that specific time period."

She shared that not only does she use ChatGPT to apply UDL principles, but also that ChatGPT explicitly references the UDL framework sometimes. P1 also used ChatGPT to create professional development materials for other teachers for accommodations or modifications to demonstrate learning in different classes and found that it provided useful methods. She stated,

"I used ChatGPT to specify for each class what it looks like to use alternative ways to demonstrate learning in music verses dance class verses art class verses our chess class verses whatever it was. And it actually did a really good job, and the teachers found that to be extremely helpful."

P1 goes beyond creating material for her students and uses the chatbot to create material on alternate ways to demonstrate learning for her colleagues.

During the focus group P2 discussed how she has used generative AI to create visuals to provide more ways to engage her students. She said,

"I create a Google Docs, Google Slides to teach each word and just to keep them engaged and I just throw in a lot of, lately Google slides lets us insert AI-generated memes. Like e.g. if the word is buttered, you can

pull a name of somebody like eating butter or something funny stuff. So kids really love that and I see the engagement has gone up by inserting these things."

When asked in the co-design session if there are considerations about any specific disabilities that P1 usually tries to incorporate into her lessons with ChatGPT, she mentioned *"physical disabilities"*, and described a case with a student with multiple disabilities and how she uses ChatGPT to create modifications for that student, saying, *"I [use prompts like], 'how would you do this for a wheelchair?', 'how would you do this for an AT device?'"* P1 found that the ChatGPT can be used to provide suggestions on modifying activities to be more accessible for specific assistive technologies and devices, which can be helpful when serving students who use a wide range and combination of them.

The focus group and co-design session provided an opportunity to collaborate and explore how generative AI tools can aid in the creation of learning content tailored to student needs for special educators when they have limited amount of time available.

DISCUSSION AND CONCLUSIONS

The focus group and co-design sessions provided a space for special educators to reflect on ways generative AI may benefit students with various disabilities and learning needs. The participants shared that they viewed generative AI as a potentially helpful tool to tailor learning content and provide recommendations to meet specific student needs. Our study also showed that special educators are interested in using generative AI tools to create personalized learning content, align with IEP goals, include core curriculum standards in lessons, and provide alternative ways to demonstrate learning. We found that special educators wanted to be able to enter IEP goals and track student learning according to their specific plan. Emerging research examining the use of generative AI for IEP goal writing has shown it to be beneficial (Rakap, 2024; Waterfield et al., 2025). Future work should examine the impact of how generative AI could improve the tracking of IEP goals from one school year to the next. Understanding the longitudinal patterns of student progress and achievement of their IEP goals may help determine whether generative AI improves the tracking and achievement of IEP goals compared to the current manual methods.

Importantly, we found that the ease with which generative AI can incorporate UDL principles may increase teachers' capacity to apply it more effectively and efficiently in their practice. For example, generative AI can provide more formats of content to present to students with disabilities. We also found that the use of generative AI tools may allow special educators to create learning content faster and generally have more content available for their students. The

special educators expressed that once they become more familiar with the use of generative AI, they would be able to utilize it more in their daily practice. Generative AI tools can also save special educators time by providing suggestions for accommodations or modifications for the specific needs of their students. For example, the focus group participants discussed several ways to modify a reading comprehension lesson to include visual aids to help reinforce student learning. The ability to easily generate learning content that is aligned with the needs and goals of diverse learners supports differentiated learning and enhances accessibility.

Revisiting the principles of UDL presented in Section 2 (CAST, 2022), our study shows that:

- Multiple Means of Representation: Generative AI tools can help teachers ensure that the content generated by AI can be customized to present information in different formats (e.g., text, visuals, auditory).
- Multiple Means of Action and Expression: Generative AI tools can be used to create lesson plans that engage students with disabilities and allow them to express their understanding in various ways.
- Multiple Means of Engagement: Generative AI tools can help teachers foster engagement by creating various versions of lesson plans that engage students with disabilities.

Finally, all participants expressed a lack of training, support, and collaboration in their positions as special educators, particularly regarding AI-enabled technologies and how to incorporate them into their practice. They also expressed appreciation for the opportunity to share and collaborate with others in their field during the focus group. Having a space to discuss the various ways in which others have used generative AI was beneficial to the participants. Future research should investigate the specific professional development needs and systemic supports required by special educators to integrate generative AI into their instructional practices effectively. Although the study increased the knowledge and curiosity of the participants about generative AI, they were still cautious about its use. This was due to a general lack of training and knowledge about AI and generative AI. Privacy, bias, and understanding of policies surrounding the use of generative AI were other concerns mentioned by the participants, which are also echoed in other research on using AI-enabled technologies by people with disabilities (e.g., McDonald et al., 2021; Crawford et al., 2024). The need for training and usage policies remains a gap in the adoption of AI in education (White et al., 2024; Qu et al., 2022; Han et al., 2024; Annapureddy et al., 2023). These concerns signal a need for both technology developers, school administrators, and educators to be aware of the limitations in using generative AI to avoid unintended harm.

Limitations

There are several limitations to our study. First, we had a small number of participants, especially for the co-design activity. While the specific expertise we were looking for in the participants limited our recruitment pool, having more perspectives would have strengthened the work. Second, we did not include the perspectives of students with disabilities in this paper. Although including these perspectives is crucial to the next stages of our project, which we are planning to do, we decided against it given the early stage of the research and lack of concrete applications or designs that participants could have provided feedback on. Finally, the interviewees had varied levels of experience with generative AI, which could potentially skew the data in favor of those with the most experience. Consideration should be given to these limitations when interpreting the findings.

Conclusion

This study highlights the ability of generative AI tools, such as ChatGPT, to assist special educators in generating learning content that aligns with the principles of Universal Design for Learning (UDL). Special educators are challenged with having various disabilities and learning needs in their classroom, and the ability to quickly adapt learning content to student needs is paramount. Generative AI tools can help them easily create learning content that meets the diverse needs of students with disabilities. The study also found that the participants were already testing Generative AI chatbots for administrative tasks and lesson planning and wanted to learn how to use them more often. The participants appreciated the ability to collaborate with other special educators on various techniques to get better results from generative AI chatbots. Knowing how to use generative AI chatbots will save special educators time and allow them to provide more individualized learning experiences to their students.

IMPLICATIONS

The findings of this study have important implications for both educators and policymakers in the context of supporting students with disabilities using new technologies, such as generative AI. As generative AI tools are increasingly used in schools, it is essential to understand how special educators can be effectively supported in adopting these tools to enhance instruction, differentiation, and student engagement. This research suggests that when paired with the principles of UDL, generative AI has the potential to expand educators' capacity to design inclusive and responsive learning experiences. However, without targeted professional development, clear ethical guidelines, and institutional support, special educators may face barriers to effective implementation. Therefore, it is also essential that administrators, policymakers, and teacher preparation programs

consider these areas when integrating generative AI to promote equity, accessibility, and student autonomy.

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Bios

Marie Sakowicz is a Ph.D. student at the University of Maryland, Baltimore County. Her research focuses on the use of AI in Special Education to help create more equitable learning environments and experiences for learners with disabilities. Email: marie.sakowicz@gmail.com

Foad Hamidi, Ph.D. Department of Information Systems, University of Maryland, Baltimore County. His research is focused on the participatory design and evaluation of emerging systems, including digital living media systems and adaptive systems, for different users, including children and adults with and without disabilities. Email: foadhamidi@umbc.edu

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