AI & Accessibility in Education

2024 Blaschke Report

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CoSN
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CAST
Forty Forward

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AI and Accessibility in Education

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Glossary

Accessibility: Accessibility refers to the design of apps, devices, materials, and environments that support and enable access to content and educational activities for all learners (CAST, 2024).

Accessibility Conformance Report (ACR): Document that explains how information and communication technology (ICT) products such as software, hardware, electronic content, and support documentation meet (conform to) the Revised 508 Standards for IT accessibility. The ACR is the completed version of the Voluntary Product Accessibility Template (see VPAT) (General Services Administration, 2024).

Americans with Disabilities Act (ADA): The Americans with Disabilities Act (ADA) is a federal civil rights law that prohibits discrimination against people with disabilities in everyday activities (U.S. Department of Justice, 2024).

Artificial Intelligence (AI): AI refers to the development of computer systems capable of performing tasks that typically require human intelligence (National Center on Accessible Educational Materials, 2024).

Assistive Technology (AT): Assistive technology is an umbrella term for assistive products and their related systems and services.

Assistive products help maintain or improve an individual's functioning related to cognition, communication, hearing, mobility, self-care and vision, thus enabling their health, well-being, inclusion and participation (World Health Organization, 2024).

Augmentative and Alternative Communication (AAC): AAC means all ways that someone communicates besides talking. People of all ages can use AAC if they have trouble with speech or language skills. Augmentative means to add to someone's speech. Alternative means to be used instead of speech (American Speech-Language-Hearing Association, n.d.).

Generative Artificial Intelligence (GenAI): Generative AI refers to deep-learning models that can generate high-quality text, images, and other content based on the data they were trained on (Martineau, 2023).

Individualized Education Program (IEP): This is a plan or program developed to ensure that a child with an identified disability who is attending an elementary or secondary educational institution receives specialized instruction and related services (University of Washington, n.d.).

Information and Communication Technology (ICT): A diverse set of technological tools and resources used to transmit, store, create, share or exchange information (UNESCO, n.d.).

Large Language Model (LLM): A category of foundation models trained on immense amounts of data making them capable of understanding and generating natural language and other types of content to perform a wide range of tasks (IBM, n.d.).

Learning Management System (LMS): A platform that assists the delivery of content online for learning purposes (Barreto et al., 2020).

National Educational Technology Plan (NETP): The NETP is a Call to Action for Closing the Digital Access, Design and Use Divides (Office of Educational Technology, 2024b).

Office of Educational Technology (OET): The OET develops national educational technology policy and establishes the vision for how technology can be used to transform teaching and learning and how to make everywhere, all-the-time learning possible for early learners through K-12, higher education, and adult education (Office of Educational Technology, 2022).

Personal Identifiable Information (PII): Any information connected to a specific individual that might disclose their identity.

Small Language Model (SLM): An SLM is a machine-learning algorithm that's been trained on a dataset much smaller, more specific, and, often, of higher quality than an LLM's (Lee, L., 2024).

Universal Design for Learning (UDL): UDL is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn (CAST., 2024).

Voluntary Product Accessibility Template (VPAT): The VPAT is a vendor self-report that is meant to help U.S. federal government agencies determine how well the products they purchase meet the Section 508 accessibility standards. After the template is filled out, it becomes an Accessibility Conformance Report (see ACR) (National Center on Accessible Educational Materials, 2021).

Web Content Accessibility Guidelines (WCAG): Defines how to make Web content more accessible to people with disabilities. Although not a law, it is an international accessibility standard referenced in many national laws including Section 508 and Title II of the Americans with Disabilities Act (World Wide Web Consortium, 2023).

Report Developers

About CoSN (Consortium for School Networking)
CoSN is a world-class professional association for K-12 EdTech leaders with the mission to provide professional development resources for EdTech leaders, their teams, and districts, allowing them to cultivate engaging learning environments. CoSN's represents over 14 million students and continues to grow as an influential voice in K-12 education. Learn more about CoSN here.

About CAST
Formerly known as the Center for Applied Science Technology, CAST is a nonprofit education research and development organization responsible for the creation of the Universal Design for Learning framework and the UDL guidelines, which are now a staple standard for making learning more inclusive. Learn more about CAST here.

The Blaschke Fellowship Fund
The Blaschke Fund was created by CoSN to support emerging leaders in education technology policy and advocacy. This memorial fund honors the late-industry giant Charles Blaschke, who conducted pioneering research and analysis on the ever-changing U.S. education landscape for over 50 years. Through the fellowship, graduate students have the opportunity to develop research along with CoSN in topics related to digital equity, protecting privacy of education data, enabling accessibility or other key topics. Learn more about the Blaschke Fellowship here.

Fernanda Pérez Perez
Fernanda Pérez is the 2024 Blaschke Fellow and she prepared this report. Fernanda is pursuing a master's degree in education policy and planning at the University of Texas at Austin. Prior to this, Fernanda worked as an ESL teacher in public and private schools in Veracruz, Mexico. In addition, she has been awarded the prestigious Fulbright scholarship and the Archer Fellowship to support her graduate studies and continue her professional development. Access Fernanda's LinkedIn profile here.

Executive Summary

This report explores the transformative potential of artificial intelligence (AI) to enhance educational accessibility and support for students, particularly those with disabilities. As AI technologies like Generative AI (GenAI) and assistive tools become increasingly prevalent in educational settings, it is crucial to understand both their benefits and limitations.

Key Findings

1. **Potential of AI for Accessibility:**

   - AI tools can significantly improve personalized learning by tailoring educational content to meet the unique needs and preferences of each student, especially those with disabilities. For example, text-to-speech software, speech recognition systems, and AI-integrated augmentative and alternative communication (AAC) tools enhance the learning experience for students with diverse needs.
   - AI can alleviate teacher burnout by automating administrative tasks such as grading and attendance tracking, allowing educators to focus more on direct student interaction and support.

2. **Use Cases and Examples:**

   - Case studies from various educational settings illustrate the practical applications of AI in enhancing accessibility. For instance, AI tools have been used to create individualized learning materials, facilitate communication for students with speech disabilities, and develop accessible math assessments for blind students.

3. **Challenges and Risks:**

   - Despite its potential, AI implementation in education comes with challenges such as data privacy concerns, algorithmic bias, and limitations in personalized learning. AI systems must be created by diverse people and trained on diverse datasets to avoid inaccuracies and ensure true representation, particularly for students with disabilities.
   - Ensuring that AI tools are designed and implemented with accessibility in mind is crucial to avoid exacerbating existing inequalities.

4. **Policy and Frameworks:**

- This report highlights the importance of policy frameworks and guidelines to ensure the safe and ethical use of AI in education. Key policies include the Americans with Disabilities Act (ADA) and updates to Title II (Nondiscrimination on the Basis of Disability in State and Local Government Services, 2024), which require state and local government entities to provide fully accessible digital resources.
- The Universal Design for Learning (UDL) framework provides a guiding principle for creating inclusive educational environments that cater to all students' needs, interests, and preferences.

5. **Recommendations:**

- This report proposes a three-level solution for safe GenAI implementation, focusing on short-term actions like professional development, medium-term actions such as ensuring accessibility for special education students, and long-term goals of universal access to AI tools.
- Ongoing collaboration among educators, policymakers, and technology developers is essential to navigate the complexities of AI in education effectively.

Conclusion

The integration of AI in education holds significant promise for enhancing accessibility and support for all students, particularly those with disabilities. However, realizing this potential requires careful planning, ethical considerations, and a commitment to equity. By prioritizing inclusive design, robust policies, and continuous professional development, we can create a future where AI empowers all students to succeed in an accessible and inclusive educational landscape.

This report serves as a comprehensive guide for educators, district leaders, and policymakers, providing insights into the benefits and challenges of AI in education and offering practical strategies for its effective and ethical implementation.

Introduction

Generative Artificial Intelligence (AI) refers to deep-learning models that can take raw data and "learn" to generate high-quality text, images, and other content when prompted (Martineau, 2023). GenAI tools and AI-integrated apps have soared in popularity in the last few years. For instance, from 2021 to 2022, AI patents worldwide increased by 62.7% (Stanford HAI, 2024). Especially, after ChatGPT became available to the public in 2022, the use of Large Language Models (LLMs) became generalized in different industries. In education, AI tools have sparked interest due to their potential to create solutions at scale such as reducing teacher workload through the automation of tasks or the promise to provide more personalized experiences to students. This interest from education actors has rapidly turned into action. According to a survey carried out by Impact Research in 2023, a majority of K-12 teachers are already utilizing ChatGPT, with usage increasing over the year. In March 2023, 51% of teachers reported using it at least once and, four months later, that rate increased to 63%.

For students with disabilities and special education teachers, this is also a turning point. At this pivotal moment, GenAI tools promise automation, personalization of learning[1], and a leverage in Assistive Technology (AT) as we have never seen before.

Nonetheless, two primary considerations are crucial now. First, by using these tools, educators must acknowledge data privacy breaches, algorithmic bias, student reidentification, and other risks linked to GenAI implementation. Second, it is essential to reflect on the extent to which students -especially students with disabilities- are benefitting from these tools equally, especially with the current update of ADA Title II, requiring all state and local government entities to have fully accessible web and mobile applications. Given the likely trend of continued integration of AI-supported tools in education, it is crucial to consider both their potential and limitations. The purpose of this report is to inform about the benefits and caveats of GenAI tools in schools while bringing forward examples and strategies that may serve as a guide for CTOs, district leaders, and educators for the implementation of AI tools that ensure data privacy and accessibility.

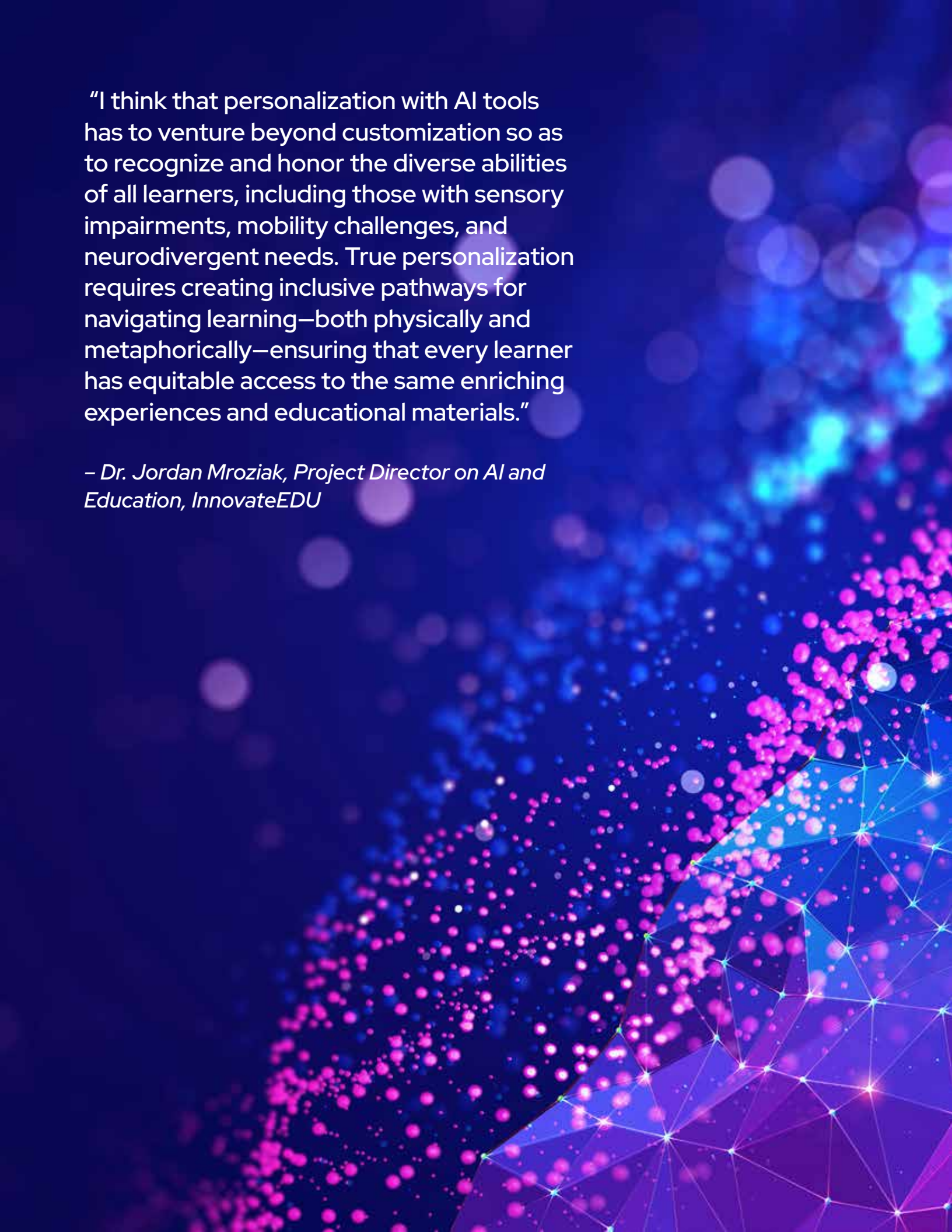
1 In CoSN's 2024 State of EdTech District Leadership survey, EdTech leaders recognized productivity (43%) and personalized education (30%) as the areas with the greatest potential for positive impact of Gen AI (CoSNa, 2024). In addition, the 2024 Driving K-12 Innovation report (CoSNb, 2024) identifies Gen AI as one of the top three tech enablers for schools.

The Importance of Accessibility

Users interact with technology differently depending on their specific needs and goals. For instance, when dealing with complex readings, AI-generated summaries can help make content more understandable[2]. Non-English speakers might need the translated version of a website, while individuals with disabilities might need alternative text in images, text-to-speech integrations, captions on videos, and other forms of Assistive Technology (AT). These specific needs are often overlooked when designing and building technology tools. The U.S. Office of Educational Technology refers to this issue as part of the Digital Access Divide. The latter term refers to the gap that exists between students who have equitable, sustainable access to connectivity, devices, and digital content and those without these resources (Office of Educational Technology [OET], 2024a). In terms of accessibility, factors widening this gap include inaccessible physical environments and transportation, lack of available AT, non-adapted Information and Communication Technology (ICT) resources, among others (World Bank Group, 2023).

Without inclusive design, numerous individuals are unable to access ICT resources commonly available to others, such as information on education and employment, shopping alternatives, and social opportunities (Kreisa, 2021). For instance, a Pew Research Center survey in 2021 found that 62% of adults with disabilities own a laptop or a computer, compared to 81% of those without a disability. Since inclusive digital design is still uncommon in online platforms and technologies, there is reduced device ownership among individuals with disabilities. (Perrin & Atske, 2021). With the current introduction of GenAI tools in education, educators must guarantee that they are benefiting all students, especially students with disabilities. Ensuring accessibility in technology design is not just a matter of convenience but a necessity for equity. By prioritizing inclusive design, we can bridge the Digital Access Divide and create a more inclusive digital world where everyone has equal opportunities to learn, work, and connect.

2 Making information and the operation of the user interface understandable is the third principle of the Web Content Accessibility Guidelines. Specifically, guideline 3.1.5 specifies that when text requires reading ability more advanced than the lower secondary education level, supplemental content that does not require a reading ability more advanced than this level must be provided (World Wide Web Consortium, 2024).



"I think that personalization with AI tools has to venture beyond customization so as to recognize and honor the diverse abilities of all learners, including those with sensory impairments, mobility challenges, and neurodivergent needs. True personalization requires creating inclusive pathways for navigating learning—both physically and metaphorically—ensuring that every learner has equitable access to the same enriching experiences and educational materials."

– Dr. Jordan Mroziak, Project Director on AI and Education, InnovateEDU

The potential of AI for Accessible Education

With the recent development of Generative AI tools that are inherently responsive and adaptable to specific needs, educators have seen its potential to advance more opportunities for accessibility in education through revolutionary changes such as enabling personalized learning, improving administrative processes, and promoting innovation.

Assistive Technology Tools

Assistive Technologies (AT) are crafted to tackle the specific obstacles that learners with disabilities might face when engaging with their educational materials[3]. Examples include text-to-speech software, screen readers, and speech recognition systems. These services help learners with disabilities to identify, obtain, and effectively use the assistive technologies that suit them best (National Center on Accessible Educational Materials [AEM Center], n. d.). Currently, AI has greatly improved the performance of Assistive Technologies. For instance, facial recognition technology for unlocking personal devices, such as phones or computers, removes the necessity of typing passwords. Another example is word prediction and voice dictation tools, which enable individuals with limited dexterity to interact with personal devices more effectively (AEM Center, 2024). In educational settings, these options have extended depending on the specific needs of students. Some examples are shown in the image below.

Use Case 1: Bruce Alter and his use cases in Oregon.

Bruce Alter is a content expert who serves as an Assistive Technology consultant with the Tigard-Tualatin School District and the Woodburn School District in Oregon. In these districts, he is experimenting with AI in different ways:

a. Augmentative and Alternative Communication (AAC) Tools: Bruce has a student with cerebral palsy whose speech is intelligible only to a handful of people. However, Bruce is testing an AI-integrated AAC which can interpret her speech and provide audio output of what his student wants to say.

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3 The Office of Educational Technology (OET) collaborated with the Office of Special Education Programs to issue the Assistive Technology Devices Guidance to support children with disabilities who need assistive technology devices and services for meaningful access in education. It stresses the importance of collaboration across departments to enhance accessibility.

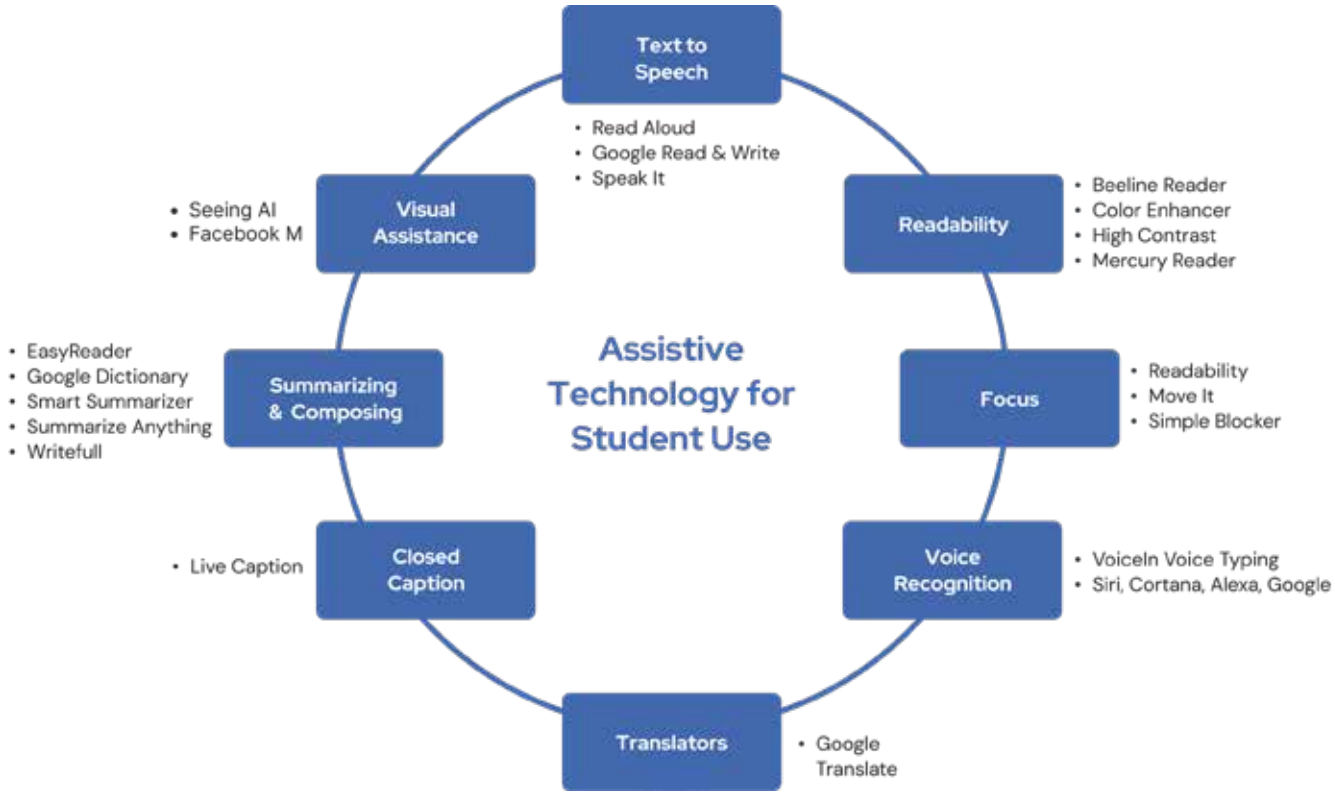

Figure 1.1 Various options for assistive technology to direct personalized learning. Created by K. Kerr (2020).

b. Large Language Model (LLM) for worksheet creation: Bruce personalized a Large Language Model (LLM) to create a math story problem helper. It is a worksheet generator in which the teacher can input the student's grade, math operation, and personal interest. Then, the program will create a worksheet and offer the option of generating an answer key.

c. LLM for assessing content mastery: Bruce personalized an LLM by training it with the common core standards for English language arts and literacy. He specified the percentages of mastery for each standard. With this program, the teacher uploads an assignment, grade level, and description. Based on the student's performance, the AI can determine at which level of mastery the student is and to what extent the student can make use of AI tools to augment rather than replace their skills.

Use case 2: Tara Bachmann and AI image creation tools.

Tara Bachmann is an Assistive Technology facilitator in the Park Hill School District in Kansas. She is using an AI-integrated image creation tool with her students with autism.

She mentions that this tool is ideal for her students, as it allows them to learn through concrete tasks by using specific written language to create pictures. (Education Week, 2024).

Use case 3: NWEA and Accessible Math Assessments.

A common access barrier for blind individuals in math assessments is that, whenever interacting with math equations, screen readers tend to read the whole equation one bit at a time, not allowing for a holistic context of the equation easily. This causes an overwhelming cognitive load, as students need to remember all the information provided by the screen reader while trying to solve the problem.

Through Microsoft's AI for Accessibility grant, the Northwest Evaluation Association (NWEA) is developing an accessible math assessment for students with disabilities. Their prototype integrates a process-driven math (PDM) AI model. PDM is a learning support tool that uses chunking to simplify algebraic expressions (Gulley, 2021). Through PDM, screen reader users can select parts of a mathematical equation and review the parts they want to explore. This reduces cognitive overload as the student can interact with the math problem as they wish (Tanase, 2022).

Alleviating Teacher Burnout

By automating tasks like grading, attendance tracking, and certain lesson planning activities, Artificial Intelligence can alleviate some of the pressures leading to teacher burnout. This increased efficiency allows educators to focus more on delivering quality education and improving student outcomes. As a result, AI could improve job satisfaction and potentially reduce turnover, especially in high-need areas like special education (Marino et al., 2024). Opposite to the idea of teacher replacement, GenAI tools can leverage the possibility of the teacher to spend more time as a facilitator of learning.

"Think of the possibilities here. You've got 30 students in an Algebra 1 classroom. You can now walk up to the Chromebook, or the iPad or whatever you're using, and you can give it specific instructions regarding what you want it to work with this student on. And it starts doing that, and now you move on to the next student. So, you can now be in 30 different places at the same time, letting artificial intelligence do its thing. And that's what I'm looking forward to."

—Dr. Chris Smallen, CTO, Lenoir City School System in Tennessee.

Individualized Education Programs (IEPs) and Personalized Learning

Individualized Education Programs (IEPs) are essential for special education teachers, as they tailor educational plans to meet the unique needs of students with disabilities. However, creating these documents is an extensive process that can take several weeks to complete. The need to organize large volumes of information, ensure correct grammar and syntax, and maintain a coherent flow in the IEP often distracts educators from their core mission: developing a robust support system for the student. In addition, considering the current shortage of special education teachers[4], the increased demand for serving more students and developing more IEPs than their time and energy allow puts a huge burden on teachers. Responsible, safe implementation of AI in the creation of IEPs can allow teachers to minimize paperwork, generate suggestions for tools and strategies to support IEP goals[5] according to the student's specific needs, and automate routine tasks, thereby reducing teachers' workload and allowing them to focus more on direct student interaction and support.

In addition, by enhancing the efficiency of IEP design with GenAI tools, there is a possibility to extend the benefits of personalized learning to all students. Identifying specific challenges that affect a student's progress and providing tailored solutions will benefit not only IEP-eligible students but all learners. Dr. Hawthorne, Chief Academic Officer for Learn21 in Ohio, illustrates the limited access to IEPs by comparing her son's experience to that of her daughters:

> "I wish his sisters could have had an IEP. They weren't eligible for one. Not because I wanted them to have a learning disability, but because I wanted somebody to care as much about personalizing instruction for them as they did for my son."

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4 The rise in students with disabilities attending school has coincided with a shortfall of special education teachers. According to data from the National Center for Education Statistics, during the 2022-23 school year, 15.2 percent of all students nationwide were enrolled in special education programs, marking the highest percentage in 47 years (National Center for Education Statistics [NCES], 2023). At the same time, 45% of schools have reported vacancies in special education roles and 78% reported difficulties in hiring special education staff (NCES, 2022a, 2022b).

5 Be mindful that it is not advised to create IEP goals with GenAI, as there are potential risks of exposing student Personal Identifiable Information (PII). Instead, GenAI can be used as a tool to provide suggestions for ways to support students in achieving the IEP goals once the latter have been identified by the teacher.

Risks and Considerations Regarding AI

Potential Risks and Limitations

Generative Artificial Intelligence is referred to as "generative" because it creates various types of content. However, to generate material, GenAI needs to be trained with data related to specific tasks, examples of documents, media, and other types of information. The more data a GenAI tool learns from, the more it can generate. Therefore, each time a user writes a prompt or provides information to the model, it will remember the user's input and learn from it to provide better responses. However, it is crucial to understand that the training process and the data sets collected are not perfect. There are risks associated with bias and privacy that need to be acknowledged before implementing AI in schools.

Limits to Personalized Learning

At this moment, the algorithm cannot recognize the diverse needs of all students. Consequently, unique accommodations and modifications for students cannot be easily standardized. For example, students on the autism spectrum exhibit a wide range of interaction behaviors, speech patterns, restricted interests, and other traits (National Institute of Mental Health, n.d.) that cannot be easily quantified or described in a prompt. If educators prompt a GenAI tool to generate an IEP for all students on the autism spectrum, the tool will produce a document that overlooks these specific characteristics.

"The "I" stands for Individualized (in IEPs). So, I appreciate the set of knowledge that AI has, and it could [...] help prompt a special education teacher's thinking about some accommodations, but asking it to flat out write the IEP? Sure, it's going to save time, but we lost the "I" in that process."

—Dr. Stacy Hawthorne, Chief Administrative Officer at Learn21

Access Barriers in AI Tools and Algorithmic Bias

Most of these tools perform, learn, and generate responses informed by datasets, which are provided by the developers of each application. Because the datasets tend to lack diversity in their user population samples, some AI tools might not work correctly for some students with disabilities. This is referred to as algorithmic bias. For instance, if an AI grading tool is designed to evaluate written responses based on standard grammatical and stylistic norms, it might unfairly penalize students with disabilities such as dyslexia, who may struggle with spelling and grammar but demonstrate a strong understanding of the material. This could result in lower grades for these students, despite their knowledge and comprehension being on par with their peers. The algorithm's lack of accommodation for diverse writing styles and needs leads to biased outcomes that disadvantage students with disabilities. More importantly, algorithmic biases could negatively impact student placement because of the tendencies involved when AI suggestions exclude students from more advanced tracks or place them in more "remedial" tracks when it is not needed.

Another concern with algorithmic bias is that some AI tools perform poorly when used by individuals with disabilities. There are tools that can identify objects for people who are blind and describe them. Still, as the tool's algorithm was trained with images captured by sighted users, it lacks efficacy when applied with pictures taken by blind users, which tend to have lower quality. Another example is speech recognition systems, which can perform less accurately for students with deaf accent or dysarthria (Morris, 2020).

Data Privacy

The advancement of GenAI use comes with substantial data privacy risks that must be addressed to protect vulnerable student populations. AI systems often require large amounts of personal data to function effectively, including sensitive information about students' disabilities, learning preferences, and educational needs. This data can be susceptible to breaches, unauthorized access, and misuse, potentially leading to discrimination, stigmatization, and loss of trust. Moreover, considering current policy requiring IEP data to be confidential, exposure of data could lead to non-compliance of federal regulations.

a. Student reidentification and profiling: Research showed that AI tools can infer disability status based on online data traces or even mouse movements (Morris et al., 2016; White et al., 2018, as cited in Morris, 2020). Because computing actions may subtly reveal an individual's disability status, there is a potential for algorithms to discriminate against users based on inferred disabilities.

b. Exposure of Personal Identifiable Information (PII): AI systems often require vast amounts of personal data to function effectively, which can include details such as names, addresses, health information, and educational records. If this data is not securely protected, it may be vulnerable to hacking, data leaks, or misuse. Considering this, sharing PII with a GenAI tool could lead to non-compliance of privacy policies such as FERPA, SOPPA, CISA, among others.

c. Unintended use of data for commercial purposes: Many GenAI tools development companies establish in their policy that once a user provides their information to the software, the company owns it and has the ability to sell it to other vendors.

Recommendation: A Three-Level Solution for Safe GenAI Implementation

Adam Garry, the former Senior Director of Education Strategy for Dell Technologies and current President of StrategicEDU Consulting suggests a three-level solution for the safe implementation of Generative AI in school districts. The levels are organized in terms of how much personalization of the tool is possible. For each level, he mentions that it is necessary to ponder their risks and rewards.

1. **General level:** Utilizing a Large Language Model (LLM) like Google's Gemini or Microsoft's Copilot: Google and Microsoft have created their own GenAI tools specifically targeted for educators. At a more general level, these tools could be valuable to create personalized content for students.

    - **Reward:** Microsoft and Google ensure their tools comply with student data protection regulations. These tools protect user and organizational data while chat prompts and responses are not saved. Additionally, these companies ensure that students' information is not retained or used to train the AI models (Microsoft Education Team, 2024; Google for Education, n.d.).

    - **Risk:** The risk is very low in terms of security, yet it exists[6]. Moreover, there might be some loss in functionality compared to other tools, as it cannot build on from a prompt standpoint. In other words, the prompt cannot "learn" from previous answers, as the latter are not saved by the model.

2. **Small Language Models:** Educators could leverage technology from Microsoft

6 Be mindful not to share any Personal Identifiable Information with any AI tool, regardless of their security measures.

or Google to develop a Small Language Model. These models are simpler, more resource-efficient text processors that can handle basic language tasks and run efficiently on common devices like smartphones. While districts can customize these models by removing unnecessary functions and focusing them on specific tasks, such as aiding in the creation of the foundational components of IEPs, it's important to note that these models are not capable of fully completing IEPs. Instead, they can suggest tools to support the goals set by educators[7].

- **Reward:** An SLM maintains the privacy protections established by Google or Microsoft while personalizing the tool for a specific need. By targeting a specific task, it is also easier to set specific guardrails and train teachers.
- **Risk:** In addition to the security risks mentioned with LLMs, they might have a more limited knowledge base compared to an LLM.

3. **The Open-Source Model:** The district could create their own GenAI application through the use of an open-source model. This model is a type of artificial intelligence (AI) where the underlying code and data are made publicly available for anyone to use, modify, and distribute.

- **Reward:** The models are highly customizable, allowing districts to tailor them to their specific needs and integrate them with existing systems. This allows them to maintain control over their data, ensuring it is used in compliance with privacy regulations and local policies.

- **Risk:** Setting up and maintaining an open-source model requires significant technical expertise and substantial computational resources, which may necessitate additional investments in infrastructure and staff training. There are security risks involved in handling sensitive student data, and ensuring robust protection is essential. Unlike proprietary software, open-source projects may lack formal customer support, and ensuring legal and regulatory compliance can be complex and challenging.

Whatever option is selected, Adam highlights the importance of merging the framework that the district has already in place to protect data privacy and go about specific tasks (such as the creation of IEPs) while detailing the tools, guidelines, and resources required in the implementation of GenAI tools.

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7 Be mindful that AI tools cannot create an Individualized Educational Program (IEP) on their own. While they can provide suggestions, it is ultimately the educators who can decide on the accommodations for each student through their knowledge and expertise.

Considerations for AI Implementation and Procurement

When procuring Generative AI (GenAI) tools for education, several critical considerations must be considered to ensure their effectiveness and ethical use:

d. Have a clear objective: Despite the growing popularity of GenAI tools, districts should identify a specific reason for their use. This approach ensures that the tool aligns with district needs and maximizes its impact on student outcomes.

e. Consider the data you provide to AI models: Many commercial models retain information provided by the user for many years, if not forever. Educators should refrain from uploading private student data and meet the expectations of policy at the federal, state, and local level (e.g. FERPA, SOPPA, etc.) regarding data privacy and the use of AI.

f. Be informed before testing: Districts must thoroughly understand the tool, including its privacy practices, security measures, and contract terms, before making a commitment. Ensure that the tool will be used solely for educational purposes.

g. Acknowledge algorithmic bias and demand action: It is essential to critically evaluate AI tools for potential biases, advocate for inclusive design, and actively seek solutions that accommodate all students' needs. Education leaders should require vendors to provide transparent information about the steps they are taking to address these issues. By being vigilant about the possibility of AI systems inadvertently disadvantaging students based on disability status or other characteristics, educators can help ensure a fair and equitable learning environment.

h. Start with Staff: Testing AI tools with staff, rather than students, helps avoid premature exposure of student data. Some companies offer beta tests or sandboxes for staff to simulate student experiences, which can be a valuable way to assess the tool's effectiveness.

i. Engage with vendors and keep them accountable: Institutions must ensure that GenAI products comply with relevant regulations and guidance, especially for safeguarding sensitive student information and meeting accessibility standards. Monitoring should be frequent and promote effective collaboration between districts and vendors.

j. Keep humans in the loop: While AI can enhance learning, human oversight is crucial to ensure that these tools are used ethically and effectively. Through continuous assessment of the tools' impact on students, educators can address potential biases and make necessary adjustments. The latter is especially important when dealing with individualized programs such as IEPs, as educators are the only ones who should decide on the appropriate accommodations for students. This collaborative approach helps balance technological advancements with personalized, empathetic teaching, ensuring that every student receives the support they need.

A Practical Example: Hinsdale Township High School District 86

Keith Bockwoldt, Chief Information Officer for Hinsdale Township High School District 86 in Illinois, shares his district's thoughtful approach to GenAI implementation. Keith's 'Reimagining Learning through Innovation' program allows teachers to pilot new tools funded by the district's IT budget. Teachers submit proposals for evaluation, which are assessed for compliance with data privacy policies before pilot implementation. Teachers must then provide evidence of the tool's impact by year-end, and the department reviews whether the tool should be adopted more broadly.

Keith highlights two critical considerations:

1. **Vendor Compliance:** He ensures vendors are aware of and comply with data privacy policies, such as the Student Online Personal Protection Act (SOPPA). He discusses data protection measures, including data purging and storage practices.
2. **Ongoing Vendor Engagement:** Continuous communication with vendors is crucial for maintaining compliance with data privacy standards.

Policy, Frameworks, and Guidance

A Discussion on Policy and Guidelines

With the sudden popularity rise in AI implementation, there has been an urge from education instances (especially at the local level) to create AI policy that aligns with curriculum standards. However, there is a growing concern about the extent to which local policies regarding AI are a priority at this moment. Currently, AI-integrated tools are constantly transforming while education actors are still in the process of learning what AI is, how to implement AI tools in their practice, and how the latter can benefit their students the most. Thus, policy might not be able to adapt and turn around fast enough to take advantage of the promise of AI in education. At this moment, it is necessary to look into the current policies in place and analyze how they align for common concerns in AI use. By being aware of the latter, leaders can focus on creating flexible guidelines and manuals of best practices that can promptly adapt to the future uses of AI as an Assistive Technology.

> " [...] we might not use the term AI in those current policies, but we have data privacy policies, we have cybersecurity policies. They are going to apply in an AI world"
>
> *– Dr. Stacy Hawthorne, Chief Administrative Officer at Learn21*

Current Policy Involving AI and Accessibility[8]

The federal government has started to design policy and guidelines around AI. At the federal level, President Joe Biden released an Executive Order on the Safe, Secure, and Trustworthy Development and Use of AI (Exec. Order No. 14,110, 2023). In the education field, the Office of Educational Technology (OET), a U.S. Department of Education division, has issued three guidance documents related to the implementation of AI in schools: (1) The National Educational Technology Plan (NETP), a general plan for technology use, (2) "AI and the Future of Teaching and Learning", a more detailed guide on equitable and ethical implementation, and (3) "Designing for Education with Artificial Intelligence", a set of guidelines for software developers when creating educational GenAI tools (OET, 2023, 2024a, 2024b).

Accessibility and individuals with disabilities are mentioned throughout these documents. The most notable keypoints are as follows:

1. **Executive Order on the Safe, Secure, and Trustworthy Development and Use of AI 8**

    - **Education focus:** the EO requires the U.S. Secretary of Education to establish policies within a year for the responsible deployment of AI in education, highlighting non-discrimination and the impacts on vulnerable communities.
    - **Disability concerns in AI:** Acknowledging potential bias, the Executive Order emphasizes the risk that AI technologies may disproportionately affect people with disabilities, notably in applications like virtual test proctoring.
    - **Collective Civil Rights' efforts:** Through collaborations like the National Center for Learning Disabilities (NCLD), CAST, and other organizations with the EDSAFE AI Alliance, as well as the Leadership Conference for Civil and Human Rights' Center for Civil Rights and Technology, efforts are being made to foster a safer and more trusted AI education ecosystem, addressing bias and discrimination.

2. **National Educational Technology Plan (OET, 2024b)**

    - **The Digital Access Divide:** Highlights the significance of ensuring equitable access to educational technology for students and educators, which includes internet connectivity, devices, and digital content. It also discusses the importance of accessibility, digital health, safety, and citizenship concerning digital access.

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8 Keypoints are also based on annotations made by Nicole Fuller, Policy Manager at The National Center for Learning Disabilities (2023)

- **Universal Design for Learning (UDL):** The plan focuses on the implementation of CAST's UDL framework to reduce the Digital Access Divide. UDL emphasizes the need to design instructional materials, evidence-based learning activities, and assessments to maximize inclusivity and accommodate a wide range of learners.

3. **AI and the Future of Teaching and Learning (OET, 2023)**

- **Adaptive Learning for Diverse Needs:** AI has the potential to increase support for students with disabilities by leveraging capabilities like speech recognition to provide more personalized and adaptive learning experiences
- **Context-Sensitive AI Models:** It is crucial for AI models to be context-sensitive, ensuring they are effective, safe, and trustworthy for diverse learners in various educational settings. This means considering neurodiversity, different learning environments, and the unique assets students bring from their experiences at home and in their communities.
- **Ensuring Fairness and Minimizing Bias:** AI systems must minimize bias and promote fairness in educational applications, ensuring that they do not exacerbate existing inequalities. This includes having measures in place to protect against algorithmic discrimination and ensuring that AI tools align with the goals of equitable education.

4. **Designing for Education with Artificial Intelligence (OET, 2024a)**

- **Algorithmic bias:** AI bias can be systemic, computational and human. Algorithmic discrimination could lead to unfair distribution in learning opportunities.
- **Equitable representation in data:** AI training data sets should reduce bias and represent user diversity.
- **Digital equity involves attention to gaps in design, use, and access.**

5. **ADA Update to Title II: Accessible Digital Resources**

In addition to the aforementioned guidelines, the United States Department of Justice issued a final rule requiring state and local governmental entities, including early childhood, K-12, and postsecondary institutions, to ensure that web- or mobile app-based digital learning resources are accessible and usable for students with disabilities. (Nondiscrimination on the Basis of Disability in State and Local Government Services, 2024). The final rule specifies that these materials must adhere to the technical requirements of the Web Content Accessibility Guidelines (WCAG) 2.1 developed by the World Wide

Web Consortium (AEM Center, n.d.). Larger districts will need to adopt compliant technology by June 2026, and smaller institutions by June 2027.

District leaders must act now to ensure compliance and promote inclusivity. This rule helps guarantee that individuals with disabilities have equal access to government services, including educational resources powered by GenAI tools, thereby upholding their rights and promoting inclusivity. It is crucial for district leaders to prioritize accessibility and take decisive steps to integrate accessible GenAI technologies, ensuring that their educational institutions are prepared to meet these new standards.

Shifting Towards Accessible Educational Technologies

On the third season of The Accessible Learning Experience, a podcast produced by CAST's AEM Center, Luis Pérez, Dr. Elizabeth Barker, and Rick Ferrie discuss some steps towards the adoption of accessible technology within districts:

1. **Make an inventory:** Rick Ferrie suggests that leaders should start by deciding on the educational tools in their district that fall under the rule's scope. It is especially necessary to understand that regardless of whether a tool is an app, a website, or another type of technology, it will be in scope if it has a digital interface.

2. **Establish a baseline:** Then, leaders should evaluate where the identified tools are positioned in terms of compliance. To do this, districts have the ability to request vendors for an Accessibility Conformance Report (ACR)9. The latter assesses a product's conformance to accessibility standards. Nonetheless, Luis Pérez highlights, the ACR may have limitations given that it is a vendor-reported statement.

3. **Prioritize impact:** Shifting to completely accessible tools may not happen immediately. Schools should prioritize the products and areas that will have the most benefit to students once they become fully accessible. Then, all the energy and resources can be directed towards a specific goal that will be both effective and impactful.

4. **Outline a roadmap:** District leaders should design a clear plan and a timeline to make the necessary modifications to the tools that were prioritized. AEM's Quality Indicators provide a helpful guideline on how to create a coordinated system to provide accessible materials to students.

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9 The ACR is the completed version of the Voluntary Product Accessibility Template (VPAT) that vendors share with procurement staff. For more information visit the Section508 website on How to create an ACR using a VPAT.

The Path Towards Institutional Application

Implementing AI tools in schools requires careful planning and a strategic roadmap to ensure these technologies enhance learning outcomes while being accessible to all students, including those with disabilities. This section outlines a comprehensive approach to incorporating AI in education, focusing on policies and practices needed in the short, medium, and long term. By prioritizing professional development, accessibility, and universal access, we can create an educational environment where AI supports and empowers every student.

A Roadmap Towards Accessible GenAI Implementation in Schools

Bruce Alter, Assistive Technology consultant with the Tigard-Tualatin School District and the Woodburn School District in Oregon, suggests a path for school districts to start implementing AI in a way that promotes accessibility and educational equity.

1. **Short Term Action:**
   Professional development is the first crucial step. Education leaders need to comprehend what generative AI (GenAI) is, how it functions, and how to implement it responsibly. Despite GenAI's wide-ranging capabilities, it is not flawless. These systems are trained on datasets provided by developers, which often lack diversity. This can lead to inaccuracies, especially for students with disabilities. For example, AI tools that identify objects for the visually impaired may fail when trained with images from sighted users but used with photos taken by blind users, resulting in lower quality (Morris, 2020). Additionally, there are significant risks such as potential re-identification of students and biases against individuals with disabilities. Thus, professional development is vital not only for understanding GenAI's responsible use but also for setting implementation standards across districts.

2. **Medium-Term Action:**

   a. Seek Expert Guidance: Collaborate with teachers and researchers who understand learning processes to determine when students should use AI tools to enhance their abilities without replacing them. For instance, defining the writing skills students need before using tools like spell check, word prediction, and GenAI.

b. Ensure Accessibility for Special Education Students: Guarantee that special education students have access to AI tools that aid their learning, even if general education students do not. Teachers should integrate AI tools into Individualized Education Programs (IEPs) as effective assistive technology, such as using GenAI to tailor assessments and curriculum to students' reading levels.

c. Expand Professional Development: Scale training to include not just special education teachers but all staff involved in the learning process, including general education teachers and paraprofessionals.

3. **Long-Term Action:**
   As AI tools become ubiquitous, it is essential to foster a culture of AI implementation in education supported by appropriate policies and professional development. Stakeholders should aim for universal access to these tools for all students, teachers, and staff. Guidelines like CAST's Universal Design for Learning framework can help assess AI tool implementation, ensuring that learning environments are inclusive and that all students can succeed. Moreover, efforts to make AI more inclusive must align with broader initiatives to address bias and foster inclusion in communities. Since education technology tools are used within specific contexts, they risk perpetuating bias and discrimination if the roots of inequity are not addressed systemically (Shelton & Lanier, 2024).

> " We must consider that our education has to change in light of these tools being an accepted and ubiquitous part of modern society."
>
> *—Bruce Alter*

Conclusions

The integration of AI in education presents a unique opportunity to enhance accessibility and support for all students, particularly those with disabilities. By leveraging AI tools, we can create more inclusive learning environments that cater to diverse needs, foster personalized learning, and alleviate teacher workload. However, this potential comes with significant challenges that must be addressed through comprehensive policies, professional development, and a commitment to equity.

AI's capabilities in identifying and addressing individual learning needs can revolutionize how we approach education. Tools like generative AI (GenAI) can personalize assessments and curriculum, ensuring that each student's learning path is tailored to their abilities and progress. This is particularly beneficial for special education students, who can greatly benefit from customized support integrated into their Individualized Education Programs (IEPs).

However, the implementation of AI in education is not without risks. Issues such as data privacy, algorithmic bias, and the potential for re-identification of students must be carefully managed. AI systems need to be trained on diverse datasets to avoid inaccuracies, especially for students with disabilities. Professional development for educators is crucial to ensure they understand the responsible use of AI and can implement it effectively and ethically.

A strategic roadmap for AI implementation in schools should focus on short-term actions like professional development, medium-term actions such as ensuring accessibility for special education students, and long-term goals of universal access to AI tools. Policies and frameworks like CAST's Universal Design for Learning can guide the creation of inclusive educational environments.

Ultimately, the successful integration of AI in education hinges on collaborative efforts among educators, policymakers, technology developers, families, and communities. By prioritizing accessibility, equity, and ethical considerations, we can harness the power of AI to create a future where all students can succeed and thrive in an inclusive educational landscape. This report underscores the necessity of thoughtful planning, continuous evaluation, and adaptive policies to navigate the complexities of AI in education. As we move forward, our commitment to accessibility and inclusion will be paramount in realizing the full potential of AI to transform education for the better.

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Appendix

Figure 1.1 Various options for assistive technology to direct personalized learning. Created by K. Kerr (2020). The image shows a diagram titled "Assistive Technology for Student Use," presented in a circular format with several categories and examples of assistive technologies.

1. **Assistive Technology for Student Use**
    - **a. Text to Speech**
        - i. Read Aloud
        - ii. Google Read and Write
        - iii. Speak It
    - **b. Readability**
        - i. Beeline Reader
        - ii. Color Enhancer
        - iii. High Contrast
        - iv. Mercury Reader
    - **c. Focus**
        - i. Readability
        - ii. Move It
        - iii. Simple Blocker
    - **d. Voice Recognition**
        - i. VoiceIn Voice Typing
        - ii. Siri, Cortana, Alexa, Google
        - e. Translators
        - i. Google Translate
    - **f. Closed Caption**
        - i. Live Caption
    - **g. Summarizing and Composing**
        - i. EasyReader
        - ii. Google Dictionary
        - iii. Smart Summarizer
        - iv. Summarize Anything
        - **v. Writefull**
    - **h. Visual Assistance**
        - i. Seeing AI
        - ii. Facebook M