

Use of Google AI tools and AI in education:

I. Introduction and Overview of AI in Education * Artificial intelligence (AI) is rapidly evolving and has the potential to transform educational practices. * The education sector is at the precipice of a significant transformation with the rapid advancement of AI, particularly generative AI (GenAI). * AI tools, such as ChatGPT and DALL-E, are changing the educational landscape. * The integration of AI in K-12 education presents unique challenges. * Governments must decide how education systems can prepare citizens to live and work safely and efficiently using AI, and how AI can improve educational equity and outcomes. * The rapid development and experimental adoption of AI in education presents multiple risks, including widening the educational divide, impacting academic integrity, potential for inaccuracy, discrimination, bias, and data privacy concerns. * Policymakers and education leaders have a key role in mitigating these risks by implementing robust policy frameworks. * Interacting with AI from an early age will help students become familiar with its capabilities, limitations, and ethical considerations. * AI in education has been referred to as the "fourth educational revolution" or Education 4.0.

II. Benefits and Opportunities of AI in Education * AI offers vast potential to transform teaching, learning, and assessment, and to reduce teachers' administrative burdens. * Thoughtfully implemented, AI in education offers enormous potential to improve student learning experiences, help teachers become more productive, and streamline education administration. * AI tools can enable personalized learning experiences. * Tailoring instruction to individual student needs. * Customizing learning experiences based on capabilities, learning styles, and preferences. * Providing personalized study materials. * Offering real-time study assistance. * AI tools can automate administrative tasks. * Automating note-taking for meetings. * Summarizing documents. * Streamlining tasks that would otherwise consume time. * Improving operational efficiencies by automating routine tasks like scheduling and communication. * Reducing administrative burden on teachers. * AI can provide real-time feedback to students. * AI can support educators in lesson planning and assessment. * Creating quizzes and answer keys. * Developing personalized lesson plans. * Assisting with grant research and writing. * Optimizing lectures. * Generating assignments and worksheets. * AI can increase student engagement. * AI can help students develop skills for the workforce. * AI-powered chatbots, like Gemini, can serve as personalized tutors or teaching assistants. * AI can assist teachers in supporting students with learning differences, including those with disabilities or English as a second language. * Leveling text for reading levels. * Enabling speech-to-text. * Personalizing assignments. * AI can assist teachers with content creation, finding resources, suggesting activities, and proposing assessment methods. * AI can generate test and quiz questions. * AI can assist teachers in analyzing student outcomes by identifying patterns and trends. * AI can mitigate academic integrity issues by identifying plagiarism or AI-generated content. * AI can streamline administrative workflows such as timetabling, scheduling, writing individual education plans (IEPs), and writing parent communications. * Translating parent-facing documents instantly and accurately. * AI can be used for pastoral care, such as identifying students who are struggling and suggesting interventions, or providing wellbeing triage and support through chatbots. * Education institutions are using AI to automate and streamline business processes in areas like admissions, finance, HR, marketing, and facilities management. * AI and GenAI have the potential to greatly advance academic research. * Scanning literature, identifying relevant papers, translating or summarizing findings. * Analyzing large datasets. * Creating synthetic data, models, and simulations. * Automating experiments, data collection, and sample processing in labs. * Reducing the administrative burden of research (grant applications, compliance, reporting, publishing). * AI in enterprise learning and continuous learning environments is accelerating, with lower stakes and more straightforward content creation compared to K-12 and higher education. * AI can transform asynchronous digital learning solutions, translating live content into self-paced experiences and generating learning elements.

III. Google AI Tools in Education (Specific Examples) * Schools and districts are using AI tools like **Gemini** and **NotebookLM**. * At Chicago Public Schools (CPS), staff are using **Gemini's Gems** feature to build AI

curriculum reviewers and using **NotebookLM** to understand district guidance and policies, such as complex financial reporting requirements. * Lorne Rodriguez, manager of enterprise generative AI for CPS, commented that **NotebookLM** and **Gemini** are helping people experiment with GenAI, transforming work and streamlining tasks. * At Miami-Dade County Public Schools, teachers are using **Gemini** to create quizzes and answer keys, while students use it for personalized study materials and additional help. High school students will have access to **Gemini for teens** in a safer environment with appropriate safeguards. Miami-Dade County Public Schools is deploying **Google's Gemini** chatbots to more than 105,000 high school students, marking the largest U.S. school district AI deployment to date. The district selected **Gemini** after testing various chatbots for accuracy, privacy, and safety, citing Google's specific content and privacy guardrails for teenagers and that information entered into **Gemini** will not be used to train Google's AI models. * At Albuquerque Public Schools, teachers are using **Gemini** for personalized lesson plans and grant research/writing. * Teachers at the Ottawa Catholic School Board use **Gemini** to create personalized learning experiences for students with different needs (special education, ESL, advanced learners). Students also use **Gemini** to explain concepts. * Students at UC Riverside use **NotebookLM** to upload readings and debate with it to test their understanding and find argument weaknesses. * Administrative staff at Wake Forest University are using **Gemini in Meet** to take notes and be more present in meetings. The provost's office uses **NotebookLM** to summarize documents and conduct analysis for university policies. They use **Gemini in Sheets** for large-scale data analysis. * Students at San Diego State University use **Gemini** and **NotebookLM** for real-time study assistance, writing support, research, and interactive learning. Faculty use them to optimize lectures, increase engagement, and accelerate research. **Gemini** integrates with the existing Google Workspace environment. * Marketing/communication professionals at Boise State University use **Gemini** for idea generation and content inspiration. **Gemini** easily integrates with Google Workspace. * Teachers and administrators should develop an AI education plan for staff and students, understanding that AI is not the same as a Google search. **Gemini** is a conversational AI tool. * The **Generative AI for Educators** course developed by Google in collaboration with MIT RAISE helps teachers save time, personalize instruction, and enhance lessons with generative AI tools like **Gemini**. * Users of **Gemini** should use their institutional accounts rather than personal ones for data protection. Google has announced data protection measures for even the free version of **Gemini**.

IV. Risks and Challenges * **Data Privacy and Security:** * AI systems often operate on large amounts of data, including sensitive student information. * Entering identifiable data into an AI model puts that student's data at risk. * AI models use entered data for machine learning and data collection. * Using AI to summarize sensitive documents or financial data can put an entire district at risk. * Carelessly entering information into AI models can compromise PII, especially if the tool suffers a data breach. * There is increasing concern about how personal data is used and stored by AI applications, with skepticism regarding the transparency and security practices of AI tool providers. * Students worry their data could be used to predict their behaviors on a larger scale in the future. * Creative students and researchers are worried their work might be stored by large language models and used in unintended ways. * Privacy and data security are foundational for building confidence in AI-powered educational tools. * Robust data governance frameworks and guidelines are necessary to protect sensitive information and comply with regulations like FERPA and COPPA. * Institutions must ensure data protection by keeping everything within their educational domain and using institutional accounts. * Effective data governance involves clear policies on data access, usage, storage, monitoring, and auditing. * Higher rates of data breaches and advanced cybersecurity threats could be aggravated by Gen AI EdTech tools. * Safety measures may be compromised due to the incentive for heightened data collection, storage, and usage by AI platforms. * Awareness among all stakeholders regarding the data collection practices of "free" generative AI platforms is important. * Clear limitations on the collection, usage, transfer, and maintenance of personal data are advocated. * **Bias and Discrimination:** * AI tools are trained on vast amounts of publicly available online text, reflecting biases from those sources and society. * They can be dominated by a white, male perspective and are highly influenced by American culture, capitalism, and the English language. * AI detectors are more likely to flag the work of non-native English speakers. * It is difficult

to determine the origin of bias in large language models (training data, algorithms, human reviewers, guardrails). * Addressing bias is challenging and problematic; changing training data or models can have unpredictable results. * Language itself contains biases. * Generative AI may reinforce flawed ideas or biases (confirmation bias). * Training data may over-represent or under-represent characteristics of race, gender, ethnicity, and social groups (demographic biases). * Responses reflect political and ideological biases from training materials. * AI-powered job-screening systems have shown gender and ethnic biases in ranking candidates. * AI-generated images can show biases and stereotypes (e.g., professors depicted as white and male, nurses stereotyped). * If AI-driven educational tools are trained on biased data, they might perpetuate inequalities. * AI can embed biases into responses, which could skew research and reinforce prejudices and stereotypes. * **Academic Integrity and Skills Loss:** * Concerns about cheating and plagiarism. * Over-reliance on technology and potential for students' critical thinking skills to diminish. * Students using AI to complete assignments without fully engaging in the learning process. * Over-reliance on AI for academic tasks can lead to a perceived or actual decline in the quality of their work. * Using AI for tasks like writing essays, answering assignment questions, and conducting research is common among students. * Educators fear that over-reliance will undermine skills in research, critical thinking, and communication. * GenAI can generate essays, solve math problems, or complete tests, raising concerns. * Students worry AI tools might provide an unfair advantage, especially premium versions, making it harder to distinguish between student-generated and AI content. * Students desire clear guidance on what counts as appropriate use versus cheating. * Constant use of AI for tasks could lead to a homogenization of thought, reducing individuality and creativity. * Reliance could hinder key interpersonal skills like listening and communication, leaving students unprepared for the workplace. * **Accuracy and Misinformation:** * AI can and will invent sources, people, and events (hallucinate). * AI is not the same as a Google search and can pull from untrustworthy sources. * Students and teachers must learn to deal with limitations regarding recency and accuracy and be taught to fact-check AI outputs. * AI tutors cannot be entrusted with educating children too young to recognize mistakes or hallucinations. * Misinformation and deepfakes are growing concerns; many students don't understand how deepfakes are created or how to spot them. * Students worry AI could be used to distort facts for political agendas or spread false information. * Students are concerned about losing a clear sense of reality in digital spaces due to undetectable AI-generated content. * **Transparency and Explainability:** * AI models can function as "black boxes," making it difficult to understand the rationale for decisions about learning pathways, grading, or student performance. * Without transparency, stakeholders cannot assess the fairness or accuracy of AI recommendations. * Clarity is vital for users who need to trust the system but also verify its decisions. * **Loss of Human Agency:** * AI must not be seen as a replacement for the human experience of learning. * Teachers remain indispensable; AI is a tool to aid and enhance human invention, skill, and judgment. * AI lacks the nuanced understanding and empathy of human educators, making it less effective for complex, context-dependent needs. * Younger students rely on direct interaction with teachers. AI should augment, not replace, human teaching. * Students value personalized teacher feedback, discussion, and collaboration alongside AI. * **Implementation Challenges:** * Lack of access to reliable high-speed internet (digital divide). * Outdated technological infrastructure. * Limited financial resources to invest in necessary hardware, software, and professional development. * Lack of training and confidence among teachers to effectively use AI. * Professional isolation in rural settings can impede innovation. * Lack of knowledge and support for teachers to adopt AI into workflows. * Most teachers do not know how to adopt AI into their daily workflows. * Most US K-12 teachers lack confidence in their ability to use AI. * Lack of universal technology access will exacerbate the digital divide. * Significant investment is needed for reliable internet, devices, and electricity. * Financial investment is needed for AI tools, data systems, maintenance, updates, data privacy, and cybersecurity measures. * Sophisticated data systems are required, complying with privacy/security standards, adding cost for software, protection, and staff training. * Many schools, especially in underserved communities, have limited budgets for advanced technologies. * Rapid pace of AI developments causes anxiety among students and learners.

V. Current Landscape and Adoption * As of Fall 2023, only around 18% of K–12 teachers nationwide reported using AI for teaching. * A small subset of early adopters (8%) are "super users" who are excited and experimenting with AI. * Two-thirds of teachers are not using AI at all. Nearly identical results (two-thirds not using AI) were found in an EdWeek Research Center survey in December. * Early adopters predominantly teach middle and high school students, particularly in English language arts and social studies. * 27% of English and social studies teachers use AI, compared to 19% in STEM and 11% in elementary education. * Reasons include supplementing/creating instructional materials and receiving less guidance in social studies. * The most common AI tools teachers use are virtual learning platforms (Google Classroom, iReady, IXL), adaptive learning software (Khanmigo), and generative AI chatbots (ChatGPT, Google's Gemini). * 50% of teachers using AI use generative AI chatbots. * AI use for generating quizzes, assignments, and worksheets is higher in higher poverty schools (41% of AI users). Teachers in higher poverty schools may use AI to generate supplemental materials beyond what their districts provide. * Students are already enthusiastic users of GenAI tools such as ChatGPT, Microsoft 365 Copilot, Google Bard, and Dall-E. * 86% of university students across 16 countries were using AI tools, 24% daily (Digital Education Council Global AI Student Survey 2024). * Nearly half of university students in an EY study had used GenAI tools for studies. * Student use of AI has raced ahead of policymaking in higher education. * Many high school students are already using Gemini outside of school. * Student AI use cases include improving written output, understanding course content, assisting with assessments, searching for information, summarizing texts, and checking grammar/spelling. * Information searching tops the list (69%), followed by grammar checking (42%). * Miami-Dade County Public Schools is the nation's third-largest school district. It is deploying Google's Gemini chatbots to more than 105,000 high school students, the largest U.S. school district AI deployment to date. This is a reversal from a ban two years prior due to cheating and misinformation concerns. * In Fall 2023, most districts planned to train teachers in 2023-24, but very few had crafted guidance. Only 5% of districts provided guidance by adopting AI-specific policies in Fall 2023. * Early adopter districts (not a representative sample) show emerging trends. * 65% of early adopters provided publicly available guidance on AI use. * Most early adopters are exploring few AI strategies (half or fewer of eight strategies tracked). * Most common strategies among early adopters: using AI tools for stakeholders (70% teachers, 58% students, 38% parents) and providing professional development (63%). * A smaller number are creating new courses/standards (30% and 8%) or using tools for safety/central office functions (18% and 15%). * Early adopters endorse or partner with various tools, with MagicSchool, SchoolAI, and Writable most frequently mentioned (excluding open-access models). * Suburban, majority-white, and low-poverty school districts are about twice as likely to provide AI-use training than urban, rural, or high-poverty districts. * AI adoption trends show a skew toward predominantly white and lower-income systems (likely meant to be higher-income based on the previous point). * As of June 2024, 47% of high school students nationwide use AI, compared to 7% of educators (according to Project Tomorrow 2024).

VI. Leadership and Policy * Educational leaders in rural districts play a pivotal role in navigating challenges and ensuring AI technologies are integrated effectively. * Leadership is essential for fostering a culture of innovation, securing necessary resources, and supporting professional development for teachers. * Rural leaders often operate within financial and organizational constraints requiring creative problem-solving, strategic partnerships, and advocacy for funding. * Educational leaders must balance the need for innovation with the reality of limited resources. * Educational leadership is particularly critical in rural settings due to resource limitations and geographic isolation. * District leaders interviewed were more focused on supporting teachers in using AI to make jobs easier than on blocking student/staff use. They worry about bringing teachers up to speed quickly. * Barriers to AI use cited by teachers include lack of school/district guidance and professional development. * District leaders' concerns seem less about school applications and more about student privacy, potential bias, and AI's impact on society. * District leaders tended to believe cheating/plagiarism could be covered under existing rules. * Policymakers and philanthropists need to take assertive action to ensure AI benefits reach students most in need. * Urgent need for faster and more comprehensive teacher training. Urban and rural districts need access to high-quality professional

development. * The U.S. should consider a national teacher-training effort, focusing on using AI to address learning needs and accelerate learning. * Government policies should ensure that AI becomes a tool for enhancing learning and equity, rather than exacerbating existing disparities. * Strategic roadmap development with a clear vision, objectives, targets, timelines, resources, and responsibilities is necessary for guiding AI adoption purposefully. * A holistic plan requires investment in both AI innovation and capacity building (equipping teachers/students). * Pedagogy and curriculum reform is needed to teach students *about* AI, *with* AI, and *for* an AI world. * Incorporate AI literacy into the national curriculum, including ethical and effective use. * Embed the use of AI in teaching practices across the curriculum. * Rethink necessary knowledge and skills for an AI-infused workforce, focusing on complementary skills like critical thinking, creativity, and teamwork. * A central government task force on AI in education can help expedite curriculum reform and facilitate collaboration. * Governments have an essential role in shaping the EdTech sector to support national education outcomes by establishing clear regulations and guidelines for tool development and use. * Governments can support innovation in EdTech through R&D funding, encouraging collaboration, providing controlled access to data for training models, and monitoring impacts. * Investing in training and re-skilling workers is needed to adapt to AI-altered workplaces. * Governments should invest in training a pipeline of AI engineers and researchers to monitor impacts.

VII. Addressing Concerns/Mitigation Strategies * Human judgment is crucial when using AI tools; chatbots cannot reason or make decisions. Evaluate AI-created material with a critical eye. * Instead of trying to eliminate biases in GenAI, work toward fairness and alignment with human values. * Use generative AI to spot biases in writing (screen for bias). * Develop policies around AI to stay ahead, using it as a tool, not a crutch. * Always have a human edit AI output. Use background knowledge and verify information. * Be specific with desired AI output. * Don't input personally identifiable information into AI tools. * Don't create accounts on untrustworthy AI tools. * Provide training for teachers and students on AI use. * Any child under 13 should not use AI technology without parental consent. * Develop clear policies that set boundaries for students and educate teachers. * Prioritize data governance and security. Use the right accounts (institutional) to protect data. Keep data within the educational domain. * Assess existing IT infrastructure, define objectives, engage stakeholders, and develop a training plan for AI integration. * Foster a culture of innovation and openness to change. Encourage experimentation and create a supportive learning environment. * Prioritize ongoing professional development for educators and administrators. * Establish a feedback loop with users. * Pilot new ideas and document what works/doesn't work, sharing lessons learned. * Invest in AI literacy for adults and students at all levels. Create opportunities for staff to practice AI regularly and deeply. * Center AI on the needs of students, families, and the broader community. Maintain transparency and ensure equity of access. * Articulate how AI can help solve long-standing challenges and guarantee equitable access to resources and strategies. * Actively pursue funding and resources to address infrastructure challenges (advocate for funding, partnerships, grants). * Improve technological infrastructure (reliable internet, up-to-date devices, equitable access). * Create a culture of innovation (collaboration, experimentation, growth mindset). Establish professional learning communities or online networks. * Ongoing and targeted professional development tailored to rural contexts is essential. Address technical skills and pedagogical strategies. * Teachers need comprehensive training to integrate AI tools effectively, understanding technical aspects and pedagogical strategies. * Develop AI literacy skills among students to prepare them for the future workforce. * Implement comprehensive professional development for educators and clear policies for equitable and ethical AI use. * Develop strategic approaches that include robust training, ethical considerations, and inclusive policies. * Leaders must advocate for investments in high-speed internet and reliable hardware. * Foster a culture of collaboration and innovation. * Provide targeted training programs to build teacher confidence and competence. Offer ongoing technical and pedagogical support. * Establish clear guidelines for AI use in education, focusing on ethical considerations. * Enhance professional development on AI's technical and ethical aspects. * Engage the community regularly in discussions about AI use. * Monitor and adapt AI implementations to address emerging ethical concerns. * Integrating lessons on AI ethics, bias detection, and

fact-checking into the curriculum. * Promote digital citizenship and cyber safety efforts to instill an ethical framework and discourage harmful uses of AI. * Students need education on ethical and legal obligations of using AI, understanding potential impacts. * Address ethical concerns, particularly data privacy, algorithmic bias, and equitable access, through governance structures like AI ethics committees or task forces. * Ensure continuous, collaborative professional learning environments for teachers. * Develop ongoing and adaptive professional development programs tailored to unique challenges. * Student needs for support include clear, consistent, course-specific guidance and policies, practical training tailored to courses, and training on how to use AI tools effectively, ethically, and responsibly. * Provide clear advice about what data is safe to share and how to protect intellectual property. * Offer careers guidance, upskilling opportunities, and practical training for an evolving job market. * Provide institutional access to core AI tools where possible and avoid widening the digital divide. * Support students to develop critical thinking, creativity, and communication skills alongside AI use. * Ensure AI use complements rather than replaces human interaction. * Students want to be involved in shaping AI within their organizations.

VIII. AI in Rural Settings * AI integration in K-12 education, particularly in rural settings, presents unique challenges. * Rural schools often face systemic barriers such as unreliable broadband access, outdated technological infrastructure, and limited AI-specific professional development opportunities. * These disparities highlight the urgent need for targeted leadership strategies to ensure that AI integration is both feasible and equitable in rural education. * Educational leaders in rural districts play a pivotal role in navigating these challenges. * A major challenge is the lack of access to reliable high-speed internet, crucial for AI tools. * The digital divide disproportionately affects rural districts, limiting their ability to implement AI-powered cloud-based platforms. * Rural schools often have fewer financial resources to invest in hardware, software, and professional development for AI integration. * Teachers in rural settings may lack the training and confidence to use AI effectively. * Without structured professional learning opportunities, rural educators may struggle, reinforcing existing disparities. * Educational leaders must develop strategies to overcome these barriers and ensure equitable and sustainable AI implementation. * Rural educational leaders must often balance the need for innovation with the reality of limited financial, technological, and human resources. * Leadership in rural settings requires creative problem-solving, community engagement, and developing sustainable strategies. * Rural leaders must find ways to engage stakeholders (parents, local businesses, government) to support technology initiatives. * AI tools can assist in creating adaptive learning environments tailored to individual needs, especially beneficial in rural mixed-age classrooms. * Concerns about students' data privacy and ethical AI use are particularly heightened in small, rural communities. * Limited internet access impedes the use of cloud-based AI platforms and prevents engagement with the latest technologies, exacerbating inequalities. * Lack of access to cutting-edge technology in rural areas places students at a disadvantage for technology-based careers. * In rural settings, teachers may have fewer opportunities for professional learning in AI. * The lack of continuous training reduces AI adoption effectiveness and contributes to reluctance among teachers. * Educational leaders need to prioritize professional development addressing AI use in STEM education. * Well-supported teachers through professional development are more likely to adopt innovative practices. * Rural leaders must actively pursue funding and resources to address infrastructure challenges (advocate for funding, partnerships, grants). * Collaborations with technology firms can provide hardware, software, technical expertise, and support. * Improving technological infrastructure is critical, prioritizing reliable internet, devices, and equitable access. * Creating a culture of innovation is a key strategy for AI adoption; professional isolation can impede innovation. Establishing professional learning communities or online networks enables collaboration across distances. * Ongoing and targeted professional development tailored to rural contexts is essential for AI integration. * AI adoption in rural schools is influenced by systemic barriers and leadership decision-making. * Rural educational leaders must evaluate AI technologies based on potential benefits and compatibility with unique challenges like limited resources and infrastructure. * Challenges during the implementation stage in rural settings are often due to infrastructural constraints and lack of professional development. * The social system plays a crucial role; in rural settings, isolation and limited networks can

hinder collaboration. * Rural educational leaders are optimistic about AI's potential to enhance STEM education, particularly personalized learning and administrative efficiency. * Concerns exist about the accuracy of AI tools in rural contexts with limited internet access. * Inadequate infrastructure and lack of professional development are key barriers identified by rural leaders. * Leaders stress the importance of securing funding and resources to improve technological infrastructure. * Fostering collaboration and innovation is seen as essential for promoting AI adoption. * Leadership is vital for driving professional development initiatives tailored to rural needs. * Rural leaders are optimistic about AI's potential to address resource limitations and mixed-age classrooms. * AI technologies were seen as a way to bridge the gap between rural and urban education by providing access to resources and learning opportunities. * Realizing opportunities requires substantial investments in infrastructure and professional development. * Infrastructure challenges (internet access, hardware) were reinforced by qualitative data showing disruption to instruction and hindering AI tool use. * Lack of AI-related professional development emerged as a major barrier. * AI adoption in rural schools demands strategic leadership interventions addressing structural limitations and fostering teacher readiness. * Rural leaders must prioritize long-term capacity-building initiatives, including AI-focused professional learning communities and partnerships. * Policy advocacy is needed to secure resources for AI integration and address the digital divide. Collaborations with policymakers, local businesses, and technology firms are important. * District leaders proactively seeking external funding and leveraging community partnerships are better positioned to implement AI sustainably.

IX. Student Perspectives * Many students are using AI tools to support their studies. * Heavy reliance on AI for academic tasks can lead to a decline in work quality. * Growing anxiety exists among students about the rapid pace of AI developments and their ability to keep up. * A major concern is misinformation, with many not understanding how deepfakes are created or spotted. * Students are worried about data privacy, particularly the possibility that AI could predict and influence their behaviors. * The most significant concern for students is the impact AI will have on their future employability. * They fear automation and changing job markets will demand new skills. * Pressure to continually upskill feels overwhelming for some. * They worry AI will impact entry-level roles and devalue skills. * Many feel unprepared for rapid job market changes. * They worry those with fewer skills might get ahead using AI effectively in applications. * Students fear it will become harder to stand out and secure interviews. * Students want clear, fair, and practical support to use AI responsibly. * AI is part of everyday life for students, used for study, life organization, job preparation, and personal support. * Academic use is evolving, helping with writing, research, note-taking, revision, and presentation skills. * Using tools like Grammarly, ChatGPT, Copilot for writing improvement. * Non-English speakers use translation tools. * Using tools for help understanding requirements, suggesting approaches, writing essays, outlining, overcoming blocks, structuring arguments, generating statements, proofreading, and content ideas. * Some use voice input feature to structure thoughts. * Many use AI to interpret marking rubrics and get feedback on work before submitting. * Disabled students find tools helpful for explaining concepts and confirming understanding; Copilot helps neurodiverse students build flexibility and fluency. * Some use AI during teamwork as a critical friend. * Routinely use AI for note-taking from lectures or texts. * Using tools like Scholarcy and Elicit to summarize research papers. * PhD students use AI as a digital colleague to brainstorm, draft, edit, and refine large works. * Use tools to create flashcards, practice papers/quizzes, fill knowledge gaps, and improve critical thinking for revision. * Use Presenter Coach for rehearsing presentations, getting feedback on style, pacing, clarity, and filler words. * Students in creative areas use AI for design ideas, image editing, content creation. * Computing students use AI tools for debugging, generating scripts, and optimizing algorithms. * Students use AI for initial data analysis. * Use Character AI for creating character bios for games design. * Use ChatGPT and Copilot to improve understanding of solving math problems. * Students use AI for daily planning and general queries. Many find it easier/quicker to ask AI than teaching staff. * Some students are not using AI due to fear of cheating classification, lack of clarity, perception it's not good enough, lack of awareness/skills, and anxiety. * Students are using AI tools to help with job application letters, CV restructuring, and interview practice. * Some students report using AI applications for relationship and mental health advice and support. * Students feel AI

can make them more efficient and institutions should move away from restriction towards adapting and embracing AI. * Students consider they should be involved in shaping AI within their organizations and are willing to participate in discussions. * Students are concerned about academic integrity, including unfair advantages from premium versions and difficulty distinguishing human from AI work. * Students are unclear on what AI use is allowed despite institutional guidance. They need context-specific policies and guidance. * Equity matters: access to AI tools is uneven, exacerbated by costs of premium versions. Uneven and inconsistent AI use across classes is unfairly disadvantaging some students. * Ethical concerns are growing: misinformation, deepfakes, bias in outputs, risks to IP and data security. * Skills loss is a real fear: overreliance could reduce critical thinking, creativity, and communication skills. * Students want to be partners, not passengers; they want to help shape how AI is integrated. * Students want structured, equitable, and practical support. * They want clear and consistent guidance and policies at institutional and course levels. * They want workshops or integrated sessions tailored for their courses. * Students understand that using AI well is a skill and want to learn prompt writing, output verification, and avoiding misinformation. * Highlight a desire for more project-based, practical learning reflecting real-life scenarios. * Neurodivergent, disabled, and international students highlighted the need for support recognizing unique challenges. * Many are unsure about the data they are giving to AI platforms. * Students see potential in AI to help them work more efficiently and focus on creative parts of jobs. * Students want to be prepared, not replaced. * They know human skills like creativity, emotional intelligence, and problem-solving will still matter. * Students believe the focus should be on teaching them how to use AI responsibly and effectively. * AI is here now and here to stay. * Students want practical support: clear policies, consistent guidance, and training in ethical, effective, and responsible AI use. * They want to build skills like critical thinking, prompt writing, fact-checking, and understanding when AI is appropriate. * Students are aware of inequalities in access and want institutions to level the playing field. * They want freedom to explore AI's potential creatively, diversely, and inclusively. * Value of humans combined with AI: AI speeds up planning/execution but can't replace discussion, personalized feedback, or tutor nuance.

X. Selected School Districts and Universities Implementing AI * Chicago Public Schools (K-12). * Miami-Dade County Public Schools (K-12). Third-largest district in the U.S.. * Albuquerque Public Schools (K-12). Ranked 35th largest in 2019. * Ottawa Catholic School Board (K-12). * University of California Riverside (Higher Ed). * Wake Forest University (Higher Ed). * San Diego State University (Higher Ed). * Boise State University (Higher Ed). * Gwinnett County Public Schools (K-12). Ranked 13th largest in 2019. Started studying AI in education before ChatGPT's debut. Incorporates AI throughout the curriculum at Seckinger High School. Has an AI Learning Framework. Launched a robust teacher training program. Released updated AI policy and guidelines in 2024. Approved AI tools include Microsoft Copilot, MagicSchool, Diffit, Curipod. * Wichita Public Schools (K-12). Ranked 97th largest in 2019. Has teachers, administrators, staff access Microsoft Copilot. Has an AI specialist. Plans to leverage Copilot and Azure for data-driven insights. * St. Vrain Valley School District (Colorado K-12). Details comprehensive approach. Includes "cutting-edge technology and innovation" in strategic plan. Gives students access to AI-focused courses and programming. Endorses various AI tools. Provided teacher professional development. * Ednovate Schools (California charter management organization). Established guiding questions for AI work (equity, personalization, sustainability). Provides access to Khanmigo and Google's Gemini Plus for all teachers. Piloting other tools. Exploring integrating AI into back-office functions. Auditing data sets for AI analysis.

XI. Teacher Professional Development and Training * District leaders are focused on how to support teachers in using AI. * Lack of professional development is a major barrier for teachers not using AI. * 23% of districts had provided training on AI as of Fall 2023, and another 37% intended to do so during the 2023–24 school year. * Suburban, majority-white, and low-poverty districts are more likely to provide AI training. * There is an urgent need for faster and more comprehensive teacher training. * Training should focus on helping teachers use AI to address learning needs and accelerate learning. * Professional development is critical for successful AI integration, particularly for teacher readiness and buy-in. * Comprehensive training for teachers

to integrate AI tools effectively is important. * Professional development needs to equip teachers with technical aspects of AI and pedagogical strategies. * Ongoing and targeted professional development tailored to rural contexts is essential. * Workshops, peer mentoring, and reflective practices are crucial for building teacher confidence and competence. * Establishing professional learning communities or online networks enables teachers to collaborate and learn. * Effective professional development must address both technical skills and pedagogical strategies for using AI in classrooms. * Lack of AI-focused professional development for teachers is a key challenge. * One-time workshops are insufficient for building AI competency; continuous, collaborative professional learning environments are essential. * Training programs should focus on practical applications of AI in classrooms. * Provide training for teachers and administrators not only on how to use AI systems but also on understanding ethical implications. * Offer ongoing training for educators on AI's technical and ethical aspects. * Educators need frameworks, training, and resources to adapt curricula, teaching content, and methods for an AI-infused world. * All teachers (not just computer science) urgently need training and support to develop AI literacy. * Comprehensive training programs are essential for all educators to equip them with skills to teach about ethical AI use and integrate technology/AI into practices. * Governments can partner with the private sector to develop AI-focused teacher training programs, materials, and qualifications. * Training topics requested include basic digital literacy, AI literacy, safe/ethical GenAI use, alignment with pedagogy, and preparing for AI's impact on skills. * Professional development for teachers introducing them to AI is highly valued by school officials.