Guidelines and Considerations for
AI in Education

WAYNE RESA
Leading... Learning for All

SERVICE
LEADERSHIP
COLLABORATION
EXCELLENCE

Purpose

This document was developed to serve the following important purposes:

- Define Artificial Intelligence and discuss the ways in which Artificial Intelligence might be used by educators and students.
- Provide practical guidance on the pedagogical, administrative, and ethical considerations related to the use of Artificial Intelligence by educators and students.
- Explore the potential future impact of Artificial Intelligence on learning.
- Provide questions to consider when reflecting the many implications AI will have on education.

This document is intended for use by district and school leadership teams as they reflect and plan to effectively support students and improve educational outcomes for all. For additional support, please contact the Wayne RESA Instructional Technology Department.

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Instructional Technology and Library Consultant

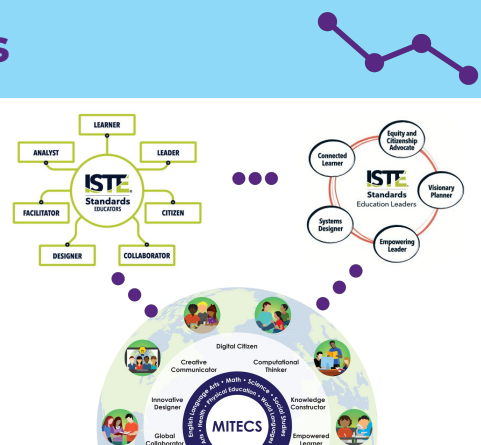**Michelle Wagner** - wagnerm@resa.net
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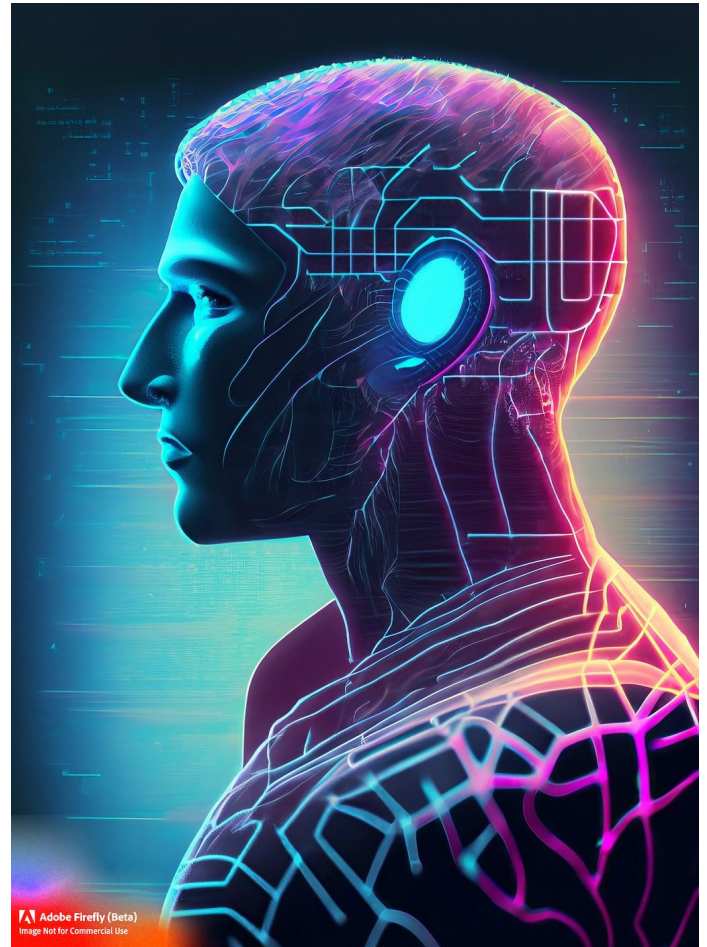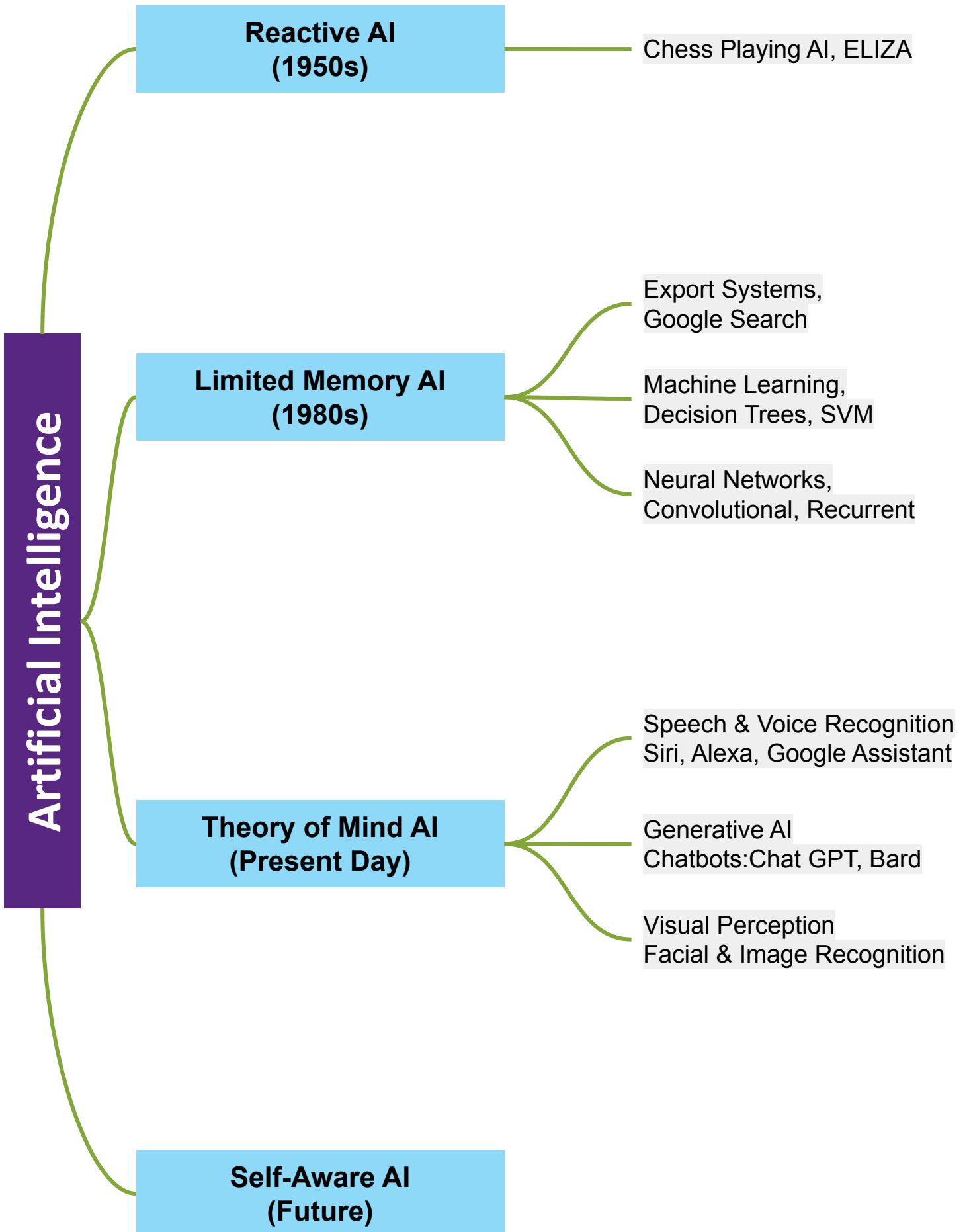
Commitment to Ongoing Review

Due to constant advancements in Artificial Intelligence and the ever-changing technology landscape, this document is subject to regular revisions to ensure its relevance and accuracy.

For the most up to date version of this guidance document, please visit **www.resa.net/ai**.

Connecting the Dots

The guidance provided in this document were developed with a focus on the MITECS or the Michigan Integrated Technology Competencies for Students (Michigan Department of Ed, 2017) and the ISTE Standards for Educators and Education Leaders (ISTE, 2023). Although connections are highlighted throughout the document, we encourage all educators to explore these standards in their entirety. For your convenience, these resources are included within the appendix of this document.

Artificial Intelligence

Reactive AI (1950s)
Chess Playing AI, ELIZA

Limited Memory AI (1980s)
- Export Systems, Google Search
- Machine Learning, Decision Trees, SVM
- Neural Networks, Convolutional, Recurrent

Theory of Mind AI (Present Day)
- Speech & Voice Recognition Siri, Alexa, Google Assistant
- Generative AI Chatbots:Chat GPT, Bard
- Visual Perception Facial & Image Recognition

Self-Aware AI (Future)

What is Artificial Intelligence?

Few topics have captured our collective attention and ignited as much curiosity as Artificial Intelligence (AI). Artificial Intelligence is a branch of computer science that aims to create machines and systems capable of performing tasks that typically require human intelligence. AI works to enable computers to make human- like **predictions** based on data, making it crucial to analyze findings for accuracy and reliability in the same way one would analyze traditional human-generated conclusions.

Due to continual advancements, it is difficult to provide a concise listing of what falls under the AI umbrella. That said, there are many manifestations and facets of AI, including machine learning, deep learning utilizing neural networks, cognitive computing, speech and voice recognition, visual perception, and generative transformers (WGU, 2020). These forms pervade all aspects of modern life. While much attention has been paid to the most recent developments in AI, these developments represent the culmination of decades of advancements within Artificial Intelligence models. These models have evolved with research and innovation. As research continues, Artificial Intelligence will also evolve and change to reflect the latest innovations.

Artificial intelligence refers to machines doing tasks previously done only by humans, like thinking and solving problems (McKinsey & Company, 2023). Computers have moved from just recording and storing information, instead studying and understanding patterns within the information they process. This ability creates two major changes that push educational technology in new directions:

1. Instead of merely collecting information, computers are now able to notice and learn from trends or patterns within that information.
2. Instead of only providing access to teaching materials, Artificial Intelligence systems can now make assertions about teaching and how best to respond to various educational situations.

These changes allow educators to leverage technology more than ever before.

According to the United States Department of Education, *"AI can be defined as 'automation based on associations.' When computers automate reasoning based on associations in data (or associations deduced from expert knowledge), two shifts fundamental to AI occur and shift computing beyond conventional edtech: (1) from capturing data to detecting patterns in data and (2) from providing access to instructional resources to automating decisions about instruction and other educational processes. Detecting patterns and automating decisions are leaps in the level of responsibilities that can be delegated to a computer system."*
(U.S. Department of Education, 2023)

"We need to empower students to harness AI's potential responsibly, preparing them to illuminate the world with knowledge, innovation, and boundless possibilities."

-Beth Gonzalez
Deputy Superintendent of Educational Services
Wayne RESA

The Potential of AI and Generative Models in Education

Many applications of Artificial Intelligence bring value in an educational setting (US Department of Education, 2023). These include uses that enhance productivity for educators and students, create novel interactions, enable teachers to more effectively meet the needs of all students, and support or augment the teaching practice (Aleven, McLaughlin, Glenn & Koedinger, 2016). AI can enhance practices and increase productivity, yet it can never replace true human expertise. When integrated into a classroom by a highly qualified educator, AI can help prepare students for the careers of the future (ISTE, 2023). Some examples representing a bright future for the use of AI in education, include:

- Personalized learning
- Rapid differentiation of lessons and text
- Intelligence Augmentation (IA)
- Intelligent tutoring
-
- Automated grading and feedback
- Adaptive testing

Adobe Firefly (Beta)
Image Not for Commercial Use

While these examples represent the mere beginning of ways in which Artificial Intelligence may revolutionize learning, school districts will benefit from exploring the implementation of these applications and their overall effects on student learning (ISTE, 2023).

ISTE Educator Standards

Empowered Professional

2.1. Learner
Teachers continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning. Teachers:
2.1.a. Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness.
2.1.b. Pursue professional interests by creating and actively participating in local and global learning networks.
2.1.c. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.

2.2. Leader
Teachers seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Teachers:
2.2.a. Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders.
2.2.b. Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.
2.2.c. Model for colleagues the identification, experimentation, evaluation, curation and adoption of new digital resources and tools for learning.

2.7. Analyst
Teachers understand and use data to drive their instruction and support students in achieving their learning goals. Teachers:
2.7.a. Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.
2.7.b. Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.
2.7.c. Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.

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Current Uses of AI in Education

Artificial Intelligence has begun to impact the work that teachers and students do in the classroom. Many educators are already leveraging the power of AI in a variety of ways. Below are some of the manifestations of AI currently being implemented in the Elementary, Secondary, Special Education, and Multilingual Education contexts:

Elementary and Secondary

Teachers are using AI tools to:

- Draft lesson plans
- Provide actionable feedback to students
- Generate ideas for learning activities
- Translate text
- Develop formative and summative assessments
- Generate drafts of communication to parents, colleagues, and administrators

ISTE Educator Standards

Learning Catalyst

2.4. Collaborator
Teachers dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Teachers:
2.4.a. Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.
2.4.b. Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.
2.4.c. Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.
2.4.d. Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.

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Special Education

Special Education Teachers are using AI tools to:

- Generate ideas for accommodations that meet specific student needs
- Make accommodations related to accessibility

Students with Special Needs are using AI tools to:

- Augment their speech and language
- Support cognitive and executive functioning
- Support visual and hearing access

MITECS

1. Empowered Learners

Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences. Students:
a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.
b. Build networks and customize their learning environments in ways that support the learning process.
c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
d. Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use, and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies.

4. Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:
a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.
b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
c. Develop, test, and refine prototypes as part of a cyclical design process.
d. Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems

MITECS, 2017. Michigan Department of Education

Administration

School Leaders are using AI tools to:

- Analyze data
- Create schedules
- Prepare proposals
- Generate communication
- Develop ideas for engaging all stakeholders

Multilingual Education

Multilingual Students are using AI tools to:

- Interpret difficult words
- Construct sentences
- Improve their writing skills
- Learn different language skills

Teachers of Multilingual Students are using AI tools to:

- Translate texts
- Generate summaries of texts at a variety of reading levels

"AI will create a learning revolution, and it's only just getting started. It has the potential to help teachers and students. While we won't achieve perfection in its implementation, suppressing AI would be misguided. Instead, we must focus on empowering students and teachers to utilize AI ethically and responsibly, providing them with the necessary support to navigate this evolving landscape."

-Alexander McNeece
Director of Instructional Services
Garden City Public Schools

ISTE Education Leader Standards

Visionary Planner
Leaders engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology.
Education leaders:
3.2.a. Engage education stakeholders in developing and adopting a shared vision for using technology to improve student success, informed by the learning sciences.
3.2.b. Build on the shared vision by collaboratively creating a strategic plan that articulates how technology will be used to enhance learning.
3.2.c. Evaluate progress on the strategic plan, make course corrections, measure impact and scale effective approaches for using technology to transform learning.
3.2.d. Communicate effectively with stakeholders to gather input on the plan, celebrate successes and engage in a continuous improvement cycle.
3.2.e. Share lessons learned, best practices, challenges and the impact of learning with technology with other education leaders who want to learn from this work.

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Pedagogical Considerations

While Artificial Intelligence has increasingly become part of modern life, it is important to consider its impact on the learning environment. As with most forms of technology, AI can be used to enhance learning. That said, used incorrectly it also has the power to undermine the learning process. The goal of AI in schools should be to advance learning outcomes while protecting human decision-making and judgment. Therefore,

- **Learning more about Artificial Intelligence is important.** Learning how AI works can help educators develop realistic expectations for its potential and its limitations. The potential for Artificial Intelligence includes the ability of AI to shift the modes and contexts of learning, to further enable personalized learning, and to provide predictive analytics. Additionally, such learning can spark innovation within the classroom.

"I am genuinely enthusiastic about the immense potential that AI holds in empowering students with disabilities and addressing learner variability. The prospect of leveraging AI technologies to create inclusive and personalized learning experiences is truly promising and inspiring."

-Amber Wade
Assistive Technology Consultant
Wayne RESA

- **Support for educators around integrating Artificial Intelligence into the learning environment is critical**. As teachers leverage the power of AI in their own work, it is imperative they feel supported and have access to high quality professional learning (Langreo, 2023). For example, instructional coaches may serve as a layer of assistance for teachers as they leverage AI for the benefit of student learning through intentional planning and facilitation of lessons.

- **Learning environments and assignments must be adapted to better encourage authentic learning.** Teachers should consider the ways in which changes to the classroom environment might mitigate the effects of students using Artificial Intelligence to auto-generate their work. This requires rethinking activity types, writing prompts, and assessment models.

- **Limitations of AI should be evaluated and discussed.** Educators should actively engage in guiding students to comprehend the limitations of AI. This involves fostering the ability to recognize hallucinations or AI-generated misinformation, discern biases resulting from training data and algorithms, differentiate between human-human interaction and human-computer interaction, and grasp the implications of AI for digital citizenship.

- **Educational leadership must ensure educators have access to emerging research on the effects of Artificial Intelligence on student learning.** Staying abreast of research and sharing pertinent findings with stakeholders will be critical, as AI continues to evolve. Additionally,

educators must strive to embrace the research and be responsive, making necessary changes. Since AI models have only recently begun to significantly impact the educational environment, educators and schools should plan to adapt as new information and new models become available.

- **Educators should exercise caution**. Exercising caution, professionals in the field must refrain from making unsubstantiated assumptions regarding Artificial Intelligence and its impact, recognizing the significance of relying on empirical educational research.

- **Educators should recognize that Artificial Intelligence is here to stay.** While accurately forecasting the full extent of AI's influence remains unattainable, it is highly probable that AI will continue to permeate the lives of students. Schools that effectively equip students for the future will enable them to harness the potential of AI, enhancing their own intelligence and paving the way for innovative opportunities that surpass current conceptions.

Adobe Firefly (Beta)
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Essential Questions

- What is the positive impact of generative AI tools?
  - What can generative AI do for teachers, and how do we help teachers take advantage of these possibilities?
- What do students need to know about Artificial Intelligence?
- How can teachers help students leverage generative and other forms of AI?
- How can we bring pedagogical best practices together with AI?
- What impact will generative AI tools have on digital literacy skills?
- What impact will generative AI tools have on literacy skills in general?

Administrative and Policy Considerations

As Artificial Intelligence becomes increasingly prevalent, it is crucial to contemplate the practical ramifications of its accessibility to both students and teachers (U.S. DOE, 2023). When making decisions regarding the availability of AI, the following factors merit careful consideration:

- **Leaders should determine AI goals, and if current guidelines and policies match those goals.** Consider practicalities of banning/limiting access. Review current guidelines around academic integrity to determine if revision or adjustments are needed.
- **School leaders should ensure that educators have access to AI tools** in order to make informed decisions about the extent to which Artificial Intelligence can be integrated into the learning.
- **School leaders and educators must recognize software and websites that purport to "detect" Artificial Intelligence in student work are limited in their accuracy** and should not be considered to provide reliable and conclusive evidence of a lack of student academic integrity.
- **Schools should adopt procedures and guidelines that directly and clearly address the use of Artificial Intelligence by school leaders, educators, and students.** This should include expectations of disclosure of the use of AI, clear definitions of academic integrity relating to the use of AI, an explanation of what constitutes appropriate AI use, and protocols for handling possible lapses in academic integrity.
- **School leaders must ensure the safety and privacy of students, employees, and parents.** Procedures and guidelines must be reviewed in light of the anticipated use of emerging technology. These policies should reflect an understanding of how AI models work, and should guide decisions about access and acceptable use. Procedures and guidelines should aim to preserve the privacy of personal data, and guide students, employees, and parents in using Artificial Intelligence in ways that prevent the sharing of personal information. Any policy or update should focus on the overall safety of users.
- **School leaders should be transparent with stakeholders about their use of AI models.** Thus creating an understanding of how AI models are utilized within the educational setting. This means being open about the various ways AI is used by educators, including classroom uses.
- **School leaders should consider providing guidance on AI for families.** School leaders should provide families with learning opportunities to more fully understand how AI works, as well as the ethical, academic, and social implications for their children. These learning opportunities should be accessible to parents of all backgrounds and in a language they understand.

ISTE Education Leader Standards

Systems Designer

Leaders build teams and systems to implement, sustain and continually improve the use of technology to support learning. Education leaders:

3.4.a. Lead teams to collaboratively establish robust infrastructure and systems needed to implement the strategic plan.

3.4.b. Ensure that resources for supporting the effective use of technology for learning are sufficient and scalable to meet future demand.

3.4.c. Protect privacy and security by ensuring that students and staff observe effective privacy and data management policies.

3.4.d. Establish partnerships that support the strategic vision, achieve learning priorities and improve operations.

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Essential Questions:

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  - What implications for policy decisions and any potential guardrails might we need to consider?
    - Given these considerations, how might we best keep educators and other stakeholders informed?
  - What are the components that constitute a high level of academic integrity?
    - How might we foster a high level of academic integrity in the work of students?
  - How do we help educators and students recognize and/or screen for false information in order to prevent the use of false information?
  - How might we address the following during policy development and revision?
    - Privacy and data collection
    - Transparency and accountability
    - Digital divide and access to resources
    - Bias
    - Equity
    - Intellectual freedom and censorship
    - Impact on employment
  - How can schools help victims of deep fake bullying or harassment?

"When AI and human creativity come together, the possibilities are endless as it can provide a solid foundation for creating excellent learning experiences. It's like having an assistant, sparking innovation and suggesting exciting new ways to engage in learning. AI will not be the 'be all, end all,' but it can certainly help to build a framework for ideas."

-Christopher Stanley
Director of Instructional Technology
Grosse Pointe Public School System

Implicit Bias Considerations

While it may seem as if Artificial Intelligence would be unbiased, this is not the case (Hutson, 2017). AI is pulling from resources and content created by humans, therefore it has the potential to produce racist, biased, and inaccurate information. Although, leading AI image generator companies have committed to enhancing their tools, acknowledging bias as a significant industry-wide concern (Small, 2023), there is still much work to be done.

Perhaps our greatest defense in recognizing such information is to study and understand the harmful effects of implicit racial associations in education. Additionally, emphasizing the importance of collaboration between researchers and scholars specializing in racial inequity in education and a diverse population of educators can help districts and schools better understand and recognize bias and determine ways to combat misinformation (Warikoo, Sinclair, Fei, & Jacoby-Senghor, 2016).

We should focus on the following components as we seek to empower educators and students to critically examine all resources, including those created by Artificial Intelligence:

- Help students develop critical thinking skills to evaluate information and identify biases. Teach them to question the source, credibility, and evidence behind AI-generated content.
- Incorporate media literacy education into the curriculum. Teach students how to analyze and evaluate information from various sources, including AI-generated content.
- Engage students in discussions about the ethical implications of AI and the potential biases embedded in AI systems. Encourage them to think critically about the impact of AI on society and the importance of addressing bias and misinformation.
- Foster an inclusive classroom environment that values diverse perspectives.
  - Discuss the importance of diverse representation in AI development.
  - Encourage students to consider the perspectives of different communities and cultures when evaluating AI-generated content.
                                    (OSU, 2023)

It is critical to highlight the necessity of scrutinizing AI outputs for bias and inaccurate information. There are flaws in AI, which have the ability to propagate misinformation, particularly affecting younger or less informed audiences who may not have the requisite knowledge to dispute these inaccuracies. Alarmingly, these errors appear to be more prevalent with people of color or minoritized groups, further exacerbating existing biases (Lieberman, 2022).

ISTE Educator Standards

Learning Catalyst

Collaborator:

Teachers dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Teachers:

2.4.a. Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.
2.4.b. Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.
2.4.c. Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally. 2.4.d. Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.

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Essential Questions:

- What work can teachers and students do to uncover their own implicit biases so they may recognize when they are confronted with them in their use of AI?
- What considerations need to be made when choosing AI-powered educational tools in regards to work done by the manufacturer to address and eliminate bias in their technology?
- What measures can be put in place to regularly audit and evaluate AI systems for signs of bias?
- How can we establish clear guidelines and policies to prevent the reinforcement of stereotypes through AI-generated content?
- What structures or policies could a district put in place to ensure teachers and students confirm sources and ask questions to not miss cultural cues and misconceptions that AI computing does not understand?
- When using AI, how can educators make sure the prompt is specific and inclusive enough to make sure all needed data sets are being included for a more accurate representation or outcome?

"AI offers educators many benefits, such as helping us increase efficiency, engagement, and accessibility. However, we must also be mindful of its barriers, including providing inaccurate information and perpetuating bias and discrimination. As educators, we must consider the risks and rewards of AI and encourage one another — and our students — to think critically about the best ways to use this tool responsibly and ethically to facilitate learning. This is where we make the difference for the well-being of children."

-Ashara Shepard-Lance
Education Improvement Consultant
Wayne RESA

MITECS

3. Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
Students:
a. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
b. Evaluate the accuracy, perspective, credibility, and relevance of information, media, data or other resources.
c. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
d. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.

MITECS, 2017. Michigan Department of Education

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Ethical Considerations

Educating staff and students on the ethics of Artificial Intelligence is crucial, as the overall impact will be measured by their ability to make informed decisions about its use, regardless of whether they serve as users or creators (Lieberman, 2022). Artificial Intelligence has the potential to revolutionize education, there are important ethical considerations to be made (European Commission, 2022). These include:

- **Privacy**: AI systems often need large amounts of data to function effectively. In an educational context, some uses could involve collecting and analyzing sensitive data about students, such as their learning habits, academic performance, and other personal information. Therefore, maintaining student privacy is the primary ethical consideration. Even with consent, it is not appropriate to prompt *public* models with identifiable data because anything shared with a model, even if information is shared in prompt form, may be added to the model for future reference and even shared with other users of the model.
- **Bias and fairness**: AI are trained using existing datasets, leading to the potential reflection and even magnification of biases existing within these datasets. Thus, we must prepare users to recognize and respond appropriately to bias, racism, and inaccurate information. For more information please see this document's section entitled *Diversity and Cultural Considerations.*
- **Cultural competence:** While AI has the potential to summarize content in such a way that we might better understand various cultures, results must be viewed with a critical lens. For more information please see this document's section entitled *Implicit Bias Considerations*.
- **Accessibility and equity**: AI has the potential to greatly enhance learning, but if access to AI technology is not universal, it could exacerbate existing educational inequity. This includes inequities based on socio-economic status, location, and disabilities.
- **Student-Teacher relationship**: AI should not replace the essential human connection between students and teachers but should serve as a tool to enhance learning. The emotional, social, and moral aspects of education are deeply human, and AI cannot replicate these.
- **Dependency**: In the absence of a full body of relevant research, it is to be acknowledged that over-reliance on AI technologies could pose a risk in the long run, as it may hinder critical thinking skills and problem-solving abilities in students. A balance needs to be maintained where AI is used as a tool to aid education.

Essential Questions:

- How might we ensure privacy and protect student data from inappropriate collection?
- How might we ensure accountability for the minimization of bias and inaccuracies in the materials produced by AI?
- How might we ensure equitable access to AI and teaching methods that leverage AI for all students?
- How might we ensure transparency and accountability of AI systems and support transparency when AI is used?
- How might we promote intellectual freedom and properly filter the AI-generated products?
- How might we promote the preservation of intellectual property, and responsible use of data?
- How might we ensure skills taught are marketable in a world in which AI will be ubiquitous?

ISTE Educator Standards

Empowered Professional - Citizen

Teachers inspire students to positively contribute and responsibly participate in the digital world. Teachers:
2.3.a. Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.
2.3.b. Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency.
2.3.c. Mentor students in the safe, ethical and legal practice with digital tools and protection of intellectual rights and property.
2.3.d. Model and promote management of personal data and digital identity and protect student data privacy.

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"Teaching students about the potential of AI goes beyond preparing them for the future; it equips them with essential life skills in the present, aiming to foster responsible and respectful digital citizenship."

-Amy Gwizdz
Elementary Educator
Dearborn Public Schools

ISTE Education Leader Standards

Equity and Citizenship Advocate

Leaders use technology to increase equity, inclusion, and digital citizenship practices. Education leaders:
3.1.a. Ensure all students have skilled teachers who actively use technology to meet student learning needs.
3.1.b. Ensure all students have access to the technology and connectivity necessary to participate in authentic and engaging learning opportunities.
3.1.c. Model digital citizenship by critically evaluating online resources, engaging in civil discourse online and using digital tools to contribute to positive social change.
3.1.d. Cultivate responsible online behavior, including the safe, ethical and legal use of technology.

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Advancements in

1950s	1980s	1990s	2000s

1956
Artificial Intelligence founded as a field of study
(Anyoha, 2017)

1985
NWEA introduces their first computer adaptive educational assessment
(NWEA, 2023)

1997
Deep Blue, IBM's chess-playing computer wins game against reigning world champion
(Reynoso, 2021)

1997
Dragon Dictate,the first speech recognition tool for consumers released
(Mutchler, 2017)

1998
Furby, toy pets with the ability to respond to questions released
(Reynoso, 2021)

2000
Netflix introduced a personalized movie recommendation system based on their Cinematch algorithm
(Biddle, 2021)

2002
i-Robot's Roomba, an autonomous robot vacuum able to clean while avoiding obstacles, released
(Reynoso, 2021)

2003
Amazon.com launches automated recommendations, individualized for users
(Hardesty, 2019)

2006
Facebook launches personalized News Feeds and Status Updates
(Meta, 2006)

2006
Twitter launches its communication platform with personalized curation for individual users
(Firstpost, 2022)

2009
Waze, a community-based traffic and navigation app, released
(Levi-Weiss, 2021)

2009
Grammarly, a cloud-based writing assistant, released
(Lytvyn, 2022)

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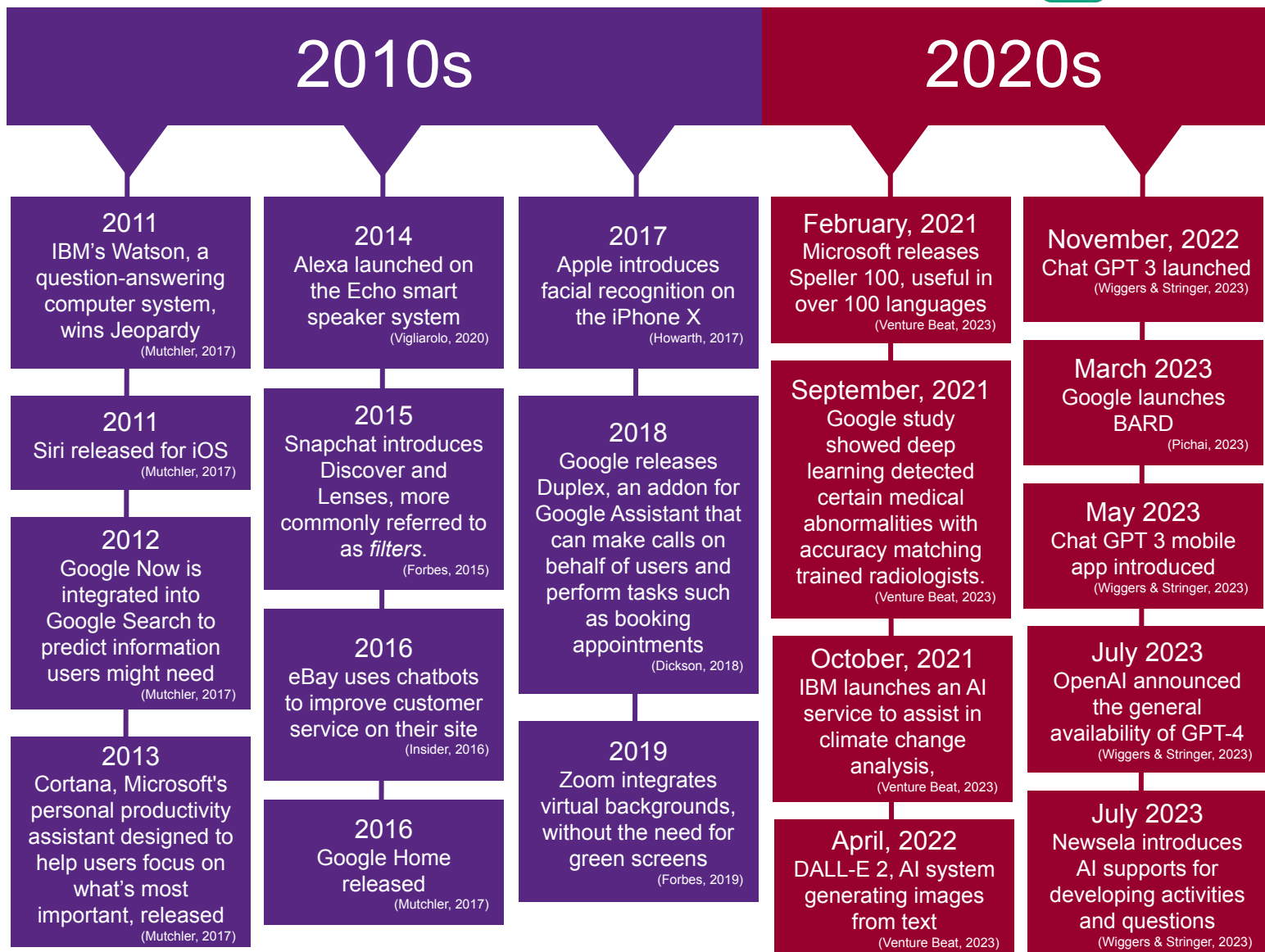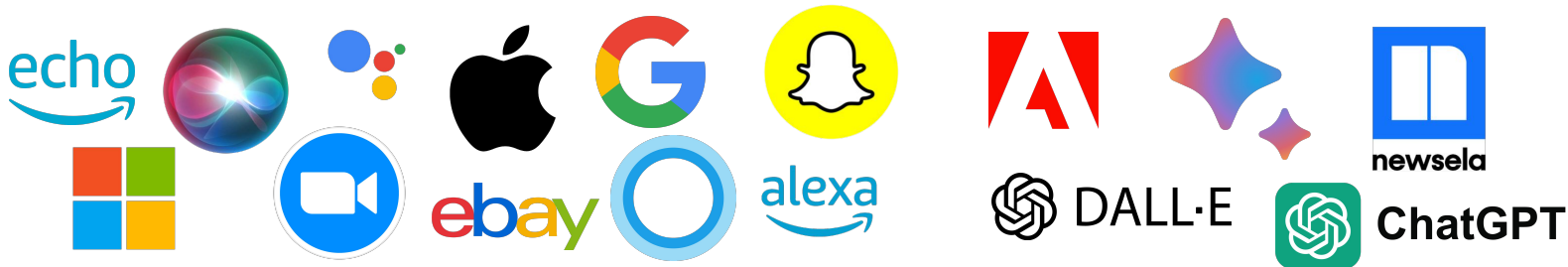
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Artificial Intelligence

2010s

2011
IBM's Watson, a question-answering computer system, wins Jeopardy
(Mutchler, 2017)

2011
Siri released for iOS
(Mutchler, 2017)

2012
Google Now is integrated into Google Search to predict information users might need
(Mutchler, 2017)

2013
Cortana, Microsoft's personal productivity assistant designed to help users focus on what's most important, released
(Mutchler, 2017)

2014
Alexa launched on the Echo smart speaker system
(Vigliarolo, 2020)

2015
Snapchat introduces Discover and Lenses, more commonly referred to as *filters*.
(Forbes, 2015)

2016
eBay uses chatbots to improve customer service on their site
(Insider, 2016)

2016
Google Home released
(Mutchler, 2017)

2017
Apple introduces facial recognition on the iPhone X
(Howarth, 2017)

2018
Google releases Duplex, an addon for Google Assistant that can make calls on behalf of users and perform tasks such as booking appointments
(Dickson, 2018)

2019
Zoom integrates virtual backgrounds, without the need for green screens
(Forbes, 2019)

2020s

February, 2021
Microsoft releases Speller 100, useful in over 100 languages
(Venture Beat, 2023)

September, 2021
Google study showed deep learning detected certain medical abnormalities with accuracy matching trained radiologists.
(Venture Beat, 2023)

October, 2021
IBM launches an AI service to assist in climate change analysis,
(Venture Beat, 2023)

April, 2022
DALL-E 2, AI system generating images from text
(Venture Beat, 2023)

November, 2022
Chat GPT 3 launched
(Wiggers & Stringer, 2023)

March 2023
Google launches BARD
(Pichai, 2023)

May 2023
Chat GPT 3 mobile app introduced
(Wiggers & Stringer, 2023)

July 2023
OpenAI announced the general availability of GPT-4
(Wiggers & Stringer, 2023)

July 2023
Newsela introduces AI supports for developing activities and questions
(Wiggers & Stringer, 2023)

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Preparing Educators to Meet the Needs of Students with Regard to Artificial Intelligence

In an effort to support educators in learning about Artificial Intelligence, Wayne RESA will provide learning opportunities around the subject of AI and its use and integration in the classroom.

These opportunities will include:

- Continued conversation with district leaders and instructional technology experts
- A variety of professional learning offerings throughout the 2023-2024 school year

Please see RESA.NET for current offerings and the most up to date information.

"I am excited that Wayne County is on the forefront of AI innovation as it relates to the field of education. AI is an extremely broad subject with powerful tools for all walks of life. Leaders from across the county are working together to harness these powerful tools to help our students and the future is bright!"

-Dr. John J. Tafelski
Assistant Superintendent for Curriculum & Instruction
Allen Park Public Schools

Adobe Firefly (Beta)
Image Not for Commercial Use

Conclusion

The advancement of Artificial Intelligence in the lives of students, educators, and educational leaders represents a pivotal moment in all aspects of life, especially in education. Educational stakeholders are advised to adopt a measured approach in embracing this emerging technology. It is crucial for them to acquire knowledge about AI, engage in ongoing dialogue to shape relevant policies, and explore strategies for empowering students to effectively harness the incredible capabilities of AI, thereby unlocking fresh avenues for learning and fostering innovation.

Glossary

Artificial Intelligence (AI): A field of computer science focused on developing intelligent machines capable of performing tasks that typically require human intelligence.

Chat Bot: computer program or AI application designed to simulate human conversation and interact with users through textual or auditory means

Cognitive Computing: A branch of AI that aims to simulate human thought processes and enhance decision-making by leveraging advanced technologies such as natural language processing and machine learning

Deepfakes: Highly realistic and often convincing manipulated media, such as videos or audio recordings, created using artificial intelligence techniques like deep learning.

Expert Systems: Computer programs that emulate human expertise in a specific domain, utilizing rules and knowledge to provide problem-solving or decision-making support

Generative AI: Involves training models to create or generate new content, such as images, text, or audio, based on patterns and examples from existing data

Generative Transformers: A type of deep learning model that utilizes transformer architecture to generate creative and coherent outputs, often used in natural language processing tasks like language translation or text generation

Hallucination: an unexpected output containing falsehoods, generated by artificial intelligence models.

Intelligence Augmentation (IA): The use of AI technologies to enhance human intelligence and capabilities, enabling individuals to achieve better outcomes and solve complex problems more effectively

Intelligent Tutoring: The application of AI techniques to create personalized and adaptive learning experiences that provide tailored instruction and feedback to learners

ISTE Standards: Standards developed by the International Society for Technology in Education (ISTE), establishing a set of guidelines that define skills and knowledge required for effective use of technology in education and promote digital literacy and innovation

Machine Learning: A subfield of AI that involves the development of algorithms and models that enable computers to learn from data and make predictions or decisions without explicit programming

MITECS: The Michigan Integrated Technology Competencies for Students is a framework that outlines technology-related skills and competencies students should develop to succeed in the digital age

Neural Networks: Computational models inspired by the structure and functioning of the human brain, consisting of interconnected nodes (neurons) that process and transmit information to perform tasks such as pattern recognition, classification, and regression

Personalized Learning: An educational approach that tailors instruction, content, and pace to meet the unique needs and preferences of individual learners, often leveraging technology and data-driven insights

Reactive AI: AI system operating solely based on its immediate environment and current inputs, lacking memory or the ability to retain information from past experiences

Theory of Mind AI: AI system possessing the ability to understand and infer the mental states of others, including beliefs, intentions, and emotions, to facilitate more sophisticated human-like interaction and social understanding

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Note: This guidance document was created by professional educators with the assistance of an artificial intelligence (AI).
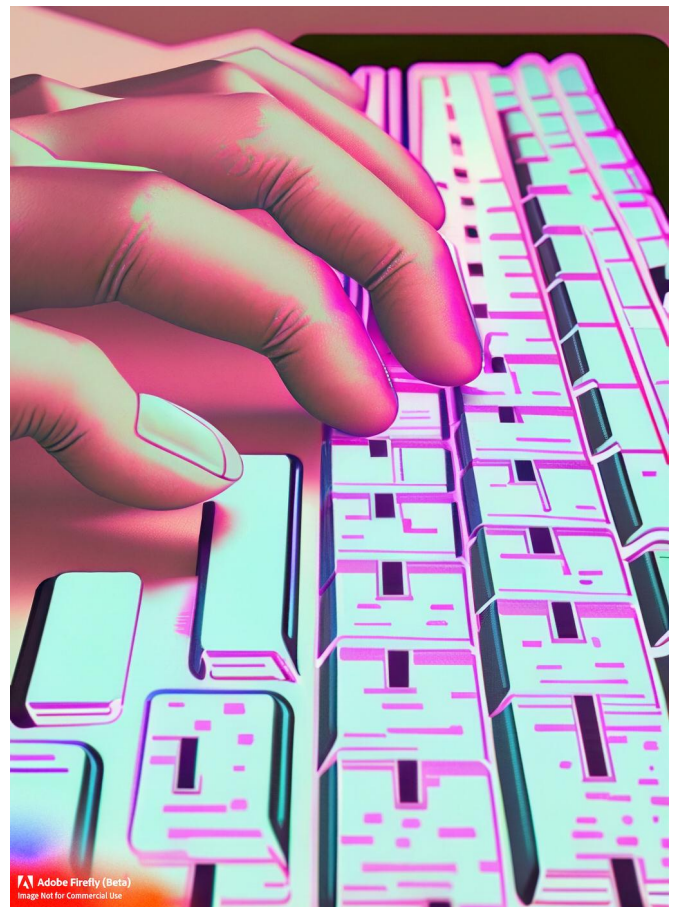
Appendix
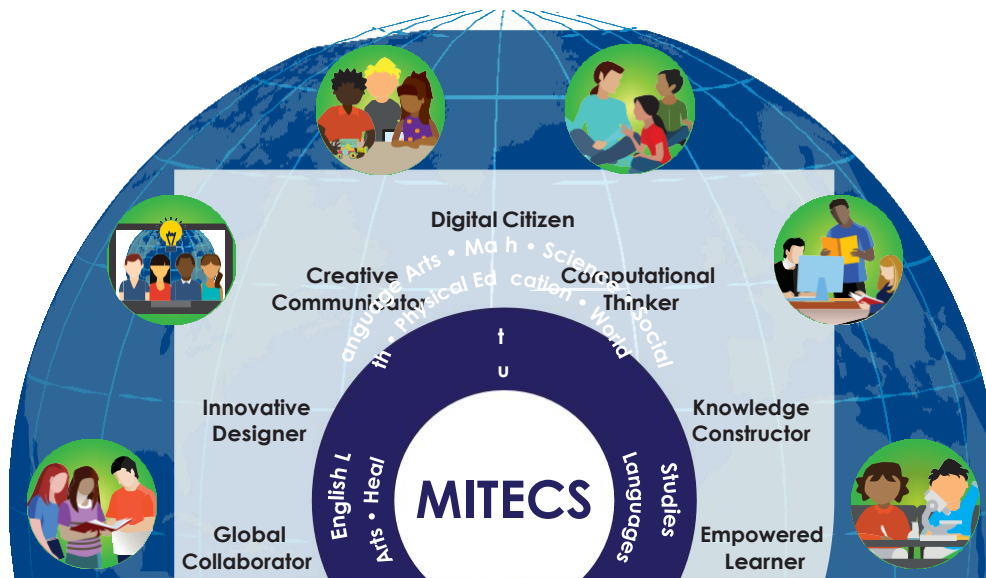
Michigan Integrated Technology Competencies for Students

The Michigan Integrated Technology Competencies for Students (MITECS) support the Top 10 in 10 Strategic Plan. The competencies specifically address two components of the Learner-Centered Supports Focus Area which include Personalized Learning and Deeper Learning. Successful implementation of the MITECS requires professional learning for technology integration to support an Effective Education Workforce. Strategic Partnerships are a critical component of the MITECS as students access networks of professional experts and explore local community issues. Finally the MITECS inherently require Systemic Infrastructure - access to devices and robust connectivity to enable everywhere, all-the-time learning.

1. Empowered Learner

Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.

Students:

a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.

b. Build networks and customize their learning environments in ways that support the learning process.

c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

d. Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use, and troubleshoot current technologies, and are able to transfer their knowledge to explore emerging technologies.

2. Digital Citizen

Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.

Students:

a. Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

b. Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.

c. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

d. Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

2017

3. Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

Students:

a. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

b. Evaluate the accuracy, perspective, credibility, and relevance of information, media, data or other resources.

c. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

d. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.

4. Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

Students:

a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.

b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

c. Develop, test, and refine prototypes as part of a cyclical design process.

d. Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

5. Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

Students:

a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

b. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

c. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

d. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

Students:

a. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

b. Create original works or responsibly repurpose or remix digital resources into new creations.

c. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

d. Publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator

Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

Students:

a. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

b. Use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints.

c. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

d. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

MICHIGAN Department of **Education**

2017

TOP 10 in 10 YEARS
putting Michigan on the map as a premier education state

SECTION 2: EDUCATORS

Empowered Professional

2.1. Learner

Teachers continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning. Teachers:

2.1.a. Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness.

2.1.b. Pursue professional interests by creating and actively participating in local and global learning networks.

2.1.c. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.

2.2. Leader

Teachers seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Teachers:

2.2.a. Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders.

2.2.b. Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.

2.2.c. Model for colleagues the identification, experimentation, evaluation, curation and adoption of new digital resources and tools for learning.

2.3. Citizen

Teachers inspire students to positively contribute and responsibly participate in the digital world. Teachers:

2.3.a. Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.

2.3.b. Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency.

2.3.c. Mentor students in the safe, ethical and legal practice with digital tools and protection of intellectual rights and property.

2.3.d. Model and promote management of personal data and digital identity and protect student data privacy.

Learning Catalyst

2.4. Collaborator

Teachers dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Teachers:

2.4.a. Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.

2.4.b. Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.

2.4.c. Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.

2.4.d. Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.

2.5. Designer

Teachers design authentic, learner-driven activities and environments that recognize and accommodate learner variability. Teachers:

2.5.a. Use technology to create, adapt and personalize learning experiences that foster independent learning and accommodate learner differences and needs.

2.5.b. Design authentic learning activities that align with content area standards and use digital tools and resources to maximize active, deep learning.

2.5.c. Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.

2.6. Facilitator

Teachers facilitate learning with technology to support student achievement of the 2016 ISTE Standards for Students. Teachers:

2.6.a. Foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings.

2.6.b. Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field.

2.6.c. Create learning opportunities that challenge students to use a design process and/or computational thinking to innovate and solve problems.

2.6.d. Model and nurture creativity and creative expression to communicate ideas, knowledge or connections.

2.7. Analyst

Teachers understand and use data to drive their instruction and support students in achieving their learning goals. Teachers:

2.7.a. Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.

2.7.b. Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.

2.7.c. Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.

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ISTE

SECTION 3: EDUCATION LEADERS

3.1. Equity and Citizenship Advocate

Leaders use technology to increase equity, inclusion, and digital citizenship practices. Education leaders:

3.1.a. Ensure all students have skilled teachers who actively use technology to meet student learning needs.

3.1.b. Ensure all students have access to the technology and connectivity necessary to participate in authentic and engaging learning opportunities.

3.1.c. Model digital citizenship by critically evaluating online resources, engaging in civil discourse online and using digital tools to contribute to positive social change.

3.1.d. Cultivate responsible online behavior, including the safe, ethical and legal use of technology.

3.3. Empowering Leader

Leaders create a culture where teachers and learners are empowered to use technology in innovative ways to enrich teaching and learning. Education leaders:

3.3.a. Empower educators to exercise professional agency, build teacher leadership skills and pursue personalized professional learning.

3.3.b. Build the confidence and competency of educators to put the ISTE Standards for Students and Educators into practice.

3.3.c. Inspire a culture of innovation and collaboration that allows the time and space to explore and experiment with digital tools.

3.3.d. Support educators in using technology to advance learning that meets the diverse learning, cultural, and social-emotional needs of individual students.

3.3.e. Develop learning assessments that provide a personalized, actionable view of student progress in real time.

3.2. Visionary Planner

Leaders engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology. Education leaders:

3.2.a. Engage education stakeholders in developing and adopting a shared vision for using technology to improve student success, informed by the learning sciences.

3.2.b. Build on the shared vision by collaboratively creating a strategic plan that articulates how technology will be used to enhance learning.

3.2.c. Evaluate progress on the strategic plan, make course corrections, measure impact and scale effective approaches for using technology to transform learning.

3.2.d. Communicate effectively with stakeholders to gather input on the plan, celebrate successes and engage in a continuous improvement cycle.

3.2.e. Share lessons learned, best practices, challenges and the impact of learning with technology with other education leaders who want to learn from this work.

3.4. Systems Designer

Leaders build teams and systems to implement, sustain and continually improve the use of technology to support learning. Education leaders:

3.4.a. Lead teams to collaboratively establish robust infrastructure and systems needed to implement the strategic plan.

3.4.b. Ensure that resources for supporting the effective use of technology for learning are sufficient and scalable to meet future demand.

3.4.c. Protect privacy and security by ensuring that students and staff observe effective privacy and data management policies.

3.4.d. Establish partnerships that support the strategic vision, achieve learning priorities and improve operations.

3.5. Connected Learner

Leaders model and promote continuous professional learning for themselves and others. Education leaders:

3.5.a. Set goals to remain current on emerging technologies for learning, innovations in pedagogy and advancements in the learning sciences.

3.5.b. Participate regularly in online professional learning networks to collaboratively learn with and mentor other professionals.

3.5.c. Use technology to regularly engage in reflective practices that support personal and professional growth.

3.5.d. Develop the skills needed to lead and navigate change, advance systems and promote a mindset of continuous improvement for how technology can improve learning.

ISTE

iste.org/standards

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