AI TOOLKIT

Guidance And Resources To Advance AI Readiness In Ohio Schools

EXECUTIVE SUMMARY

Consistent with Lt. Governor Jon Husted's mission to make Ohio the most innovative and entrepreneurial state in the Midwest, **InnovateOhio** has partnered with AI experts to identify opportunities to use artificial intelligence for good. Recognized through this collaboration was the need for trusted resources, so that Ohio's K-12 educators can prepare students to live, work and thrive in an AI world. InnovateOhio has commissioned the development of this toolkit, *AI Toolkit: Guidance and Resources to Advance AI Readiness in Ohio's Schools*, to answer this need. This toolkit will equip stakeholders in Ohio's schools (district superintendents, school principals, educators, parents, and more) with the resources to advance AI literacy among their students.

The *AI Toolkit* meets the need by providing two types of guidance: (1) guidance on a sound, transparent, and practical method for translating high-level aspirational goals into actionable AI-focused policies and (2) guidance on the resources available to stakeholders (superintendents, principals, teachers, parents, and the citizens of Ohio generally) as they seek to implement that method on the way to concrete policies and practices that ensure the safe, effective, and responsible integration of AI in Ohio's schools.

This toolkit is not intended as a mandate to use artificial intelligence in education, but instead as a trusted and vetted resource that will aid Ohio's educators and parents in their mission to prepare our students for this emerging technology.

INTRODUCTION

Education is, by definition, forward-looking: a central goal is to prepare today's students for the world they will inhabit tomorrow. Anticipating the skills and resources that will be required in a future state is always a challenge, but it becomes even more so as the pace of technological change accelerates, making it difficult simply to keep up, let alone anticipate. Under the leadership of Lt. Governor Jon Husted, InnovateOhio is meeting this challenge head-on, spearheading the development of a toolkit that will equip stakeholders in Ohio's schools (district superintendents, school principals, educators, parents, and more) with the tools and resources needed not just to keep up with advanced technologies but to make full use of their potential in preparing today's students for the world in which they will live, learn, and work tomorrow.

THE NEED

"Artificial intelligence" (AI), as a field of academic research, originated in the 1950s.[1] It is only in recent years, however, that the field, after passing through several hype-disappointment cycles in public consciousness, has yielded products ready for commercial and industrial use. While its advent is recent, its spread has been broad and rapid, extending to applications in transportation, marketing, law, medicine, warfighting – and education. Although its spread has been rapid, it has also been uneven; some have embraced the new technologies, some have resisted them, others simply don't know where to begin.

The advent of AI-enabled technologies has brought with it concerns about the risks associated with those technologies including concerns about privacy, fairness, individual agency, the nature and role of human reasoning. Discussion of these concerns has generated a wide range of guidelines for the governance of AI, and these guidelines have in turn triggered changes in the regulatory environment within which AI-enabled systems are adopted and deployed. These regulatory changes, like the technological changes to which they are intended to respond, are rapid but also unevenly distributed; there are differences from one jurisdiction to the next and that mix becomes even more confusing when potential "extraterritorial" effects are taken into consideration.

Ohio's schools cannot, even if they wanted to, detach themselves from these developments. Stakeholders in Ohio's educational system recognize that to meet the needs of their students, Ohio's schools must take advantage of the potential offered by the new technologies: the potential to make education and assessment more efficient and effective and to make teaching more nuanced and better tailored to the specific needs of individual students. Stakeholders also recognize that the school system must identify and address the risks that come with the new technologies; risks that impact access and representation, course content and skills development, as well as competence and effectiveness.

[1] *The first usage of the term "artificial intelligence," in its current sense, is generally attributed to a workshop that John McCarthy (along with Marvin L. Minsky, Nathaniel Rochester, and Claude E. Shannon) organized at Dartmouth in 1956 called "The Dartmouth Summer Research Project on Artificial Intelligence." The original proposal for the workshop is available at: McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006). A proposal for the dartmouth summer research project on artificial intelligence, August 31, 1955. AI magazine, 27(4), 12-12.*

If there is little disagreement about the need to adapt, finding an answer to the question of *how* to do so remains a challenge. For example:

- **A district superintendent**, having attended an AI-focused workshop, is convinced of the potential that AI offers but feels her district is behind the curve in the adoption, use, and governance of AI and is unsure how to come up with a roadmap for catching up.

- **An elementary school principal**, faced with an unexpected staff vacancy, would like to use AI-enabled technologies to improve and accelerate the process of finding a suitable replacement but is worried about questions of bias in AI-enabled recruiting technologies and how to protect against it.

- **A high school history teacher**, recognizing that his students will be using AI-enabled technologies to assist in research and writing when they get to college, does not want to ban the use of the technologies in his course but is unsure how to use the technologies in a way that does not atrophy his students' capacity for independent research and reasoning.

- **A school counselor**, investigating an online bullying incident, is alarmed at the widespread use of generative AI technologies, both for innocent and not innocent purposes, to produce and share fake images.

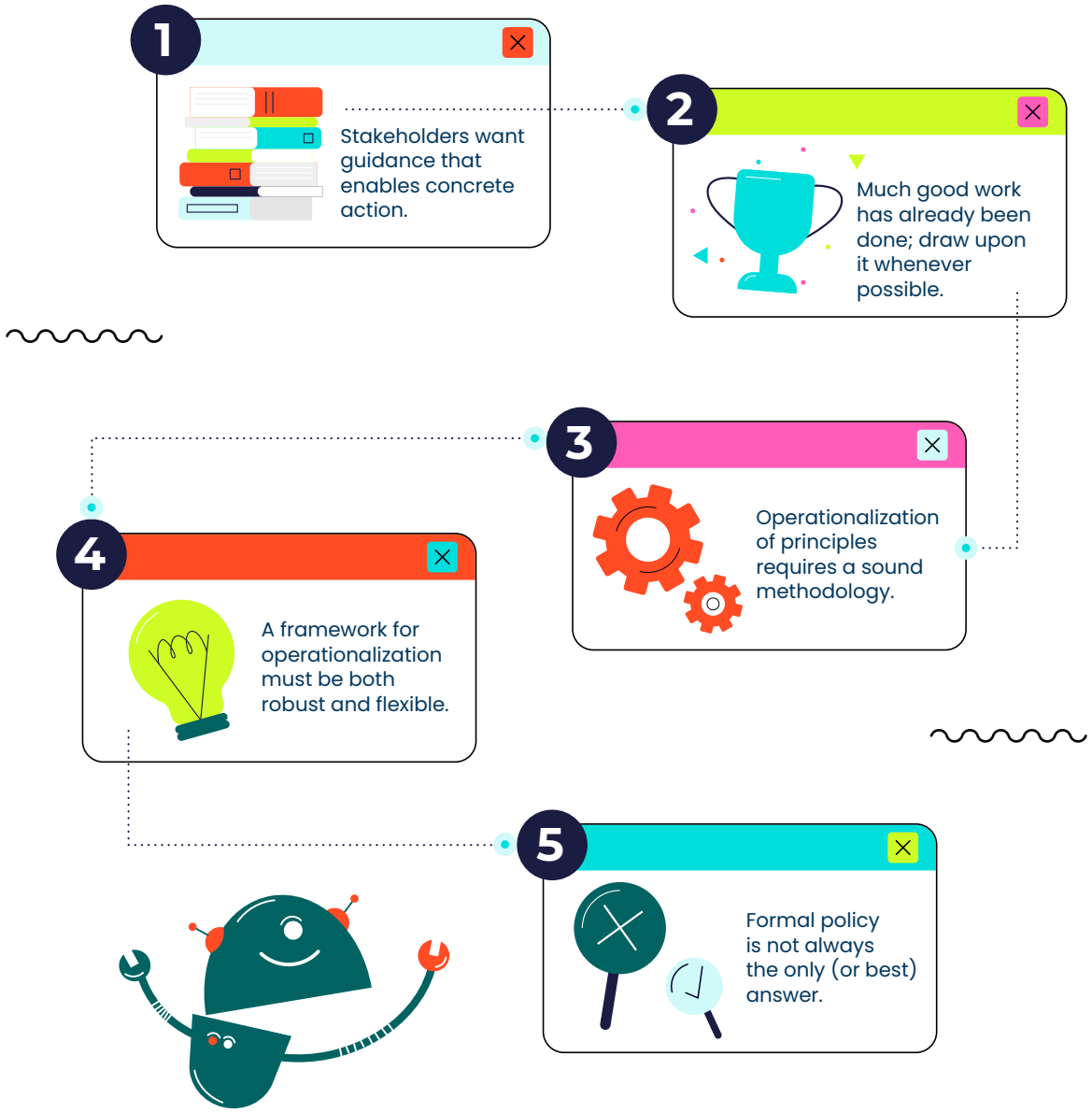
- **A district information officer** who once thought he had a handle on the data generated and stored in his district, finds that the new technologies being introduced to schools, both by teachers and students, have seriously undermined the comprehensiveness of his "data map," raising new worries about data privacy, security, and integrity.

- **The parent of a child with a learning disability** is eager to identify and address the specific challenges that are impeding her child's progress but is concerned about the effectiveness of AI-enabled diagnostic technologies and about the possibility that her child will be misdiagnosed.

The purpose of this toolkit is to provide stakeholders with a readily actionable resource for addressing such issues. Its goal, more specifically, is to equip stakeholders with tools, and methods for using the tools, that will allow them to develop sound, durable, and tailored policies and practices for making safe, effective, and responsible use of AI in their districts and schools.

MEETING THE NEED

In designing the toolkit, aiEDU has consulted with a range of different stakeholders in Ohio's educational system.[2]



[2] In preparation of this toolkit, aiEDU, with the support of the Teaching Institute for Excellence in STEM (TIES), gathered insights and perspective from a cross-section of stakeholders in Ohio's educational system, ranging from district superintendents, to educators, to technology directors, and to representatives of interested civic organizations. The interviews covered a range of different topics related to the integration of AI in Ohio's schools, from the foundational values that the adoption of AI is intended to advance, to the current state of AI usage and governance, and to the nature of the future state that is envisioned and the practical means to get there. The input aiEDU received from these stakeholders in Ohio's schools shaped both the organization and content of this toolkit.

These stakeholders, all of whom are actively engaged in addressing the challenges of incorporating AI into Ohio's schools, provided valuable ground-level insights that have shaped the design and content of the toolkit. Key premises that have informed the approach taken are the following:

- **Stakeholders want guidance that enables concrete action.**
  There is a place for high-level principles, but what is needed now is a path to operationalize those principles, an actionable plan for putting them into practice in a way that is effective and measurable.

- **Much good work has already been done; draw upon it whenever possible.**
  This premise ("don't reinvent the wheel") extends both to questions of policy development (not every new technology needs a new policy; some already existing policies are robust enough to cover aspects of emerging technologies) and to questions of resources for the development of policy (several initiatives have produced guidance for the governance of AI in the domain of education; where suitable, the tools created by such initiatives should be utilized).

- **Operationalization of principles requires a sound methodology.**
  Operationalization cannot be done in an ad hoc manner. What is required is a unifying framework that makes transparent the connections between the high-level objectives and the operational-level directives (and all the steps in between). Such a framework should be designed to allow transparent inspection of the reasoning behind policies and assessment of potential gaps or redundancies in those policies.

- **A framework for operationalization must be both robust and flexible.**
  A cookie-cutter approach won't meet the diverse needs of Ohio's schools. What is needed is a robust plan of action that provides solid guidance while also allowing adaptation to a school's specific circumstances and to ongoing changes in the technological and regulatory landscape.

- **Formal policy is not always the only (or best) answer.**
  Effective operationalization does not always lead to a formal policy. A range of normative instruments are available for encouraging the responsible use of AI, from formal, enforceable, policies to less formal guidance and best practices. Even educational initiatives designed to make school staff better-informed users of AI-enabled tools can be effective ways of mitigating risks associated with AI. All solutions should be considered.

In keeping with these premises, the toolkit has been designed to map out a practical, robust, and flexible path to the development of policies and practices encouraging the responsible use of AI in their districts and schools. The approach taken is straightforward. In *Part 1: Policy Development for AI In Education – A Step-By-Step Approach)*, the toolkit provides an overview of a step-by-step method for identifying what is needed for effective governance of AI in Ohio's schools and for developing and enacting policies and practices that will meet those needs. The remainder of the toolkit *(Parts 2 – 7)*, provides an inventory and review of resources available for accomplishing each of the steps identified in Part 1 as well as guidance on how to use the resources most effectively.[3] The specific parts of the *Toolkit* are as follows.

- **Part 1: Policy Development for AI in Education – A Step-By-Step Approach.**
  An overview of a five-step process for deriving concrete policies from aspirational values and objectives.

- **Part 2: Introduction to Resources for Policymakers, Teachers, and Parents.**
  An introduction to the survey of resources provided in *Parts 3 – 7 of the Toolkit.*

- **Part 3: Resources for Policymakers – A Functional Overview.**
  An overview of the resources policymakers may draw upon in executing the policy-development steps identified in Part 1.

- **Part 4: Resources for Teachers.**
  An overview of resources available to teachers seeking to integrate AI in their classroom instruction and practices.

- **Part 5: Resources for Parents.**
  An overview of resources available to parents seeking to partner with schools in ensuring that their children are well-equipped for an AI-enabled world.

- **Part 6: A Guide to Guidelines.**
  An inventory of key guidelines for the responsible use of AI, covering their scope, intent, and significant contributions.

- **Part 7: Summary of Resources.**
  A summary of the areas of focus for each of the guidelines discussed in the *Toolkit*.

If executed well, a toolkit so designed will equip stakeholders at all levels of Ohio's educational system, from administrators engaged in statewide policy formulation to district-level school board members to a home-schooling parent, with the tools and methods needed to think through the issues raised by the emergence of AI-enabled technologies and to arrive at sound and effective norms for the use of those technologies. If executed well, and applied well, such a toolkit will help to bring about a state in which stakeholders in Ohio's schools feel empowered, not daunted, by the emergence of AI-enabled technologies and can confidently and safely integrate the technologies into their everyday practice. If the toolkit achieves those objectives, it will have realized its fundamental goal of making technology a resource, not a challenge, an outcome that will allow Ohio's administrators, educators, and parents to focus on the jobs to which they are devoted: preparing Ohio's children to flourish in the world of tomorrow.

[3] Direction to these resources is provided simply as a guide to available information that stakeholders may find helpful. Reference to a resource does not imply its endorsement by InnovateOhio, the office of the Governor or Lt. Governor, or the State of Ohio.

PART 1

POLICY DEVELOPMENT FOR AI IN EDUCATION A STEP-BY-STEP APPROACH

In recent years, discussions of AI governance have shifted their focus from the identification of high-level principles to which AI systems should adhere to the question of how we put those principles into practice in the design and operation of AI-enabled systems. In a paper from 2020, for example, the authors emphasized the urgency of undertaking "the second phase of AI ethics: translating between the '*what*' and the '*how*,'" a phase that will entail hard work as "[t]he gap between principles and practice is large."[4] The need to bridge this gap in the domain of education was a recurrent theme in the discussions aiEDU had with Ohio educators and administrators in preparing this toolkit. What schools, educators, and parents were most in need of were actionable plans with tangible milestones for introducing AI into Ohio's schools effectively and responsibly. One stakeholder said, for example, "I don't think we mind flying by the seat of our pants … but I think we could benefit from some type of roadmap, … I think we would benefit from what a good school district looks like. Where should they be and where should they not be at the end of 2024 and what programs should they be considering."

"Bridging the gap," however, or operationalizing principles, is an undertaking that requires careful thought. It is not simply a matter of closing the book on principles and turning attention to concrete policies and practices. It is a matter of arriving at policies and practices that are anchored in, and comprehensively reflect, the first-order principles, and accomplishing that requires a well-thought-out methodology. Without such a methodology, we cannot be confident that any policies we enact will serve to advance the principles that are the motivation for our efforts. Put another way, the "bridge" we use in "bridging the gap" matters.

In keeping with these considerations, aiEDU has developed a simple but methodical approach to deriving policies and practices from high-level principles. The approach is a five-step process that, after surveying the existing landscape, begins with the identification of core values (those that are articulated in high-level principles) and then proceeds, step-by-step, to progressively more specific and concrete instantiations of those values until we arrive at truly actionable normative instruments[5] against which real-world practice in the adoption and use of AI in schools can be assessed. The five steps, in summary form, are as follows:

[4] *Morley, J., Floridi, L., Kinsey, L., & Elhalal, A. (2020). From what to how: an initial review of publicly available AI ethics tools, methods and research to translate principles into practices. Science and engineering ethics, 26(4), 2141-2168: 2147.*

- **Step 1:** Take stock of the current landscape with regard to (a) AI-enabled technologies available for use in schools, (b) policies already in place applicable to those technologies, and (c) one's own resources for adopting technologies and implementing policies.
- **Step 2:** Identify the high-level values, goals, and priorities that, independent of AI, are driving current initiatives at the school or district.
- **Step 3:** From goals identified in *Step 2*, derive principles for the responsible adoption and use of AI.
- **Step 4:** On the basis of the principles identified in *Step 3*, articulate policies governing the adoption and use of AI in schools.
  - **Step 4a:** Take inventory of the evidence that might be used in assessing adherence to a given principle.
  - **Step 4b:** On the basis of the inventory obtained in *Step 4a*, articulate actionable, evidence-based policies for enforcing adherence to the relevant principles.
- **Step 5:** Put the policies into practice.
  - **Step 5a:** Enact the policies, providing as needed, training to those affected and building in monitoring and feedback mechanisms.
  - **Step 5b:** Periodically assess and adapt the policies based on the feedback mechanisms put in place in *Step 5a*.

These steps, designed to be **intuitive**, **robust**, and **flexible**, allow for the derivation of **assessable**, **evidence-based**, **normative instruments** (policies, but also standards, guidance, and best practices) from high-level values and objectives. They thus meet the need for an **effective** and **transparent** mechanism for bridging the gap between core values that underlie Ohio's educational system and the everyday practices that should instantiate those values. The remainder of this section provides greater detail on each of the steps in the process.

[5] *We, deliberately, leave the type of normative instrument open at this point.*

STEP 1: TAKING STOCK OF THE LANDSCAPE

The goal of this step is to ensure that those who will be developing policies for the governance of AI are equipped with an up-to-date understanding of the lay of the land, as it relates to (a) AI-enabled technologies, (b) the regulatory environment within which those technologies may be deployed, and (c) the internal resources available for addressing the challenges of deployment and compliance. This step is positioned first in the policy development workflow because having a baseline understanding of the technological and regulatory landscape, and of the capabilities of one's team, is a precondition for the effective execution of the other steps. The step should be considered an ongoing process, however, as the landscape is always changing. It will be necessary to continue to monitor developments in the technology and regulatory spaces so that the more substantive policy development steps are always informed by an up-to-date view of the relevant landscape. Key elements of this step may be summarized as follows:

- **Objective:** Obtain an up-to-date understanding of (a) currently available AI-enabled technologies applicable to education, including the capabilities and risks associated with those technologies, (b) the normative environment within which these technologies will be deployed, including both already-enacted policies and less formal published guidance on the use of AI in schools, and (c) the resources within one's school or district that can be drawn upon in adopting technologies and implementing policies. This picture will inform subsequent policy-development steps by bringing into view the technologies that are within the scope of the policy-development effort, the policies that may be repurposed, perhaps with adaptation, to address emerging technologies, the guidance that may be drawn upon in the development of AI-focused policy, and the composition of the internal team that will be tasked with meeting the challenge.

- **Method:** Initial survey and ongoing monitoring of reports published by government agencies, academic institutions, non-profit initiatives, and news organizations.

- **Inputs:** Published guidelines, reports, and articles (including blog posts) on developments in the technology and regulatory domains, as well as assessments of the internal resources available for meeting the challenges of AI adoption.

- **Participants:** State or district superintendents (and their staffs), with input gathered, as needed, from other stakeholders.
- **Output:** A continually updated summary of the lay of the land concerning AI-enabled education technologies, the regulations that govern their use, and the composition and structure of the internal team tasked with overseeing AI-related technology adoption and policy development.

STEP 2: IDENTIFYING HIGH-LEVEL VALUES AND GOALS

The goal of this step is to ensure that the policy-development effort is anchored in the values, objectives, and priorities that, independent of any AI-specific considerations, define the mission of Ohio's schools. The issues raised by AI and the strategies for addressing them can be complex and the literature on these topics is rapidly growing. It is essential, therefore, at the start of the policy-development process, to establish (or reaffirm) the fundamental touchstones that will guide the process. Doing so will help avoid making policy for policy's sake and will provide a reference point for resolving disputes at the more specific stages of policy development. Key elements of this step may be summarized as follows:

- **Objective:** Obtain a clear view of the core values and objectives that inform all initiatives undertaken in Ohio's educational system. These are the values and objectives that the instruments that come out of the policy-development exercise are ultimately intended to protect and advance.
- **Method:** Review of relevant mission statements and other documentation of core values and priorities.
- **Inputs:** Mission statements, school handbooks, short- and long-term plans (both statewide and district-level), and budget documents.
- **Participants:** State or district superintendents (and their staffs), with input gathered, as needed, from other stakeholders.
- **Output:** A summary of the core values that drive Ohio's educational system.

STEP 3: DERIVING PRINCIPLES FROM VALUES

The goal of this step is to develop principles for the adoption and use of AI-enabled technologies that will ensure that the use of AI in Ohio's schools is consistent with and, where possible, advances the core values identified in Step 2. These principles stand at an intermediate level between values and policy: they are more specific than values, in that they pertain specifically to capabilities and risks associated with AI-enabled technologies, but less specific than policies, in that they stop short of prescribing assessable actions or standards. The principles are thus at the center of the effort to bridge the gap. Key elements of this step may be summarized as follows:

- **Objective:** The creation of a set of principles governing the adoption and use of AI in a district or school.
- **Method:** Taking into account the technology landscape developed in *Step 1*, derive, from the core values and objectives identified in *Step 2*, principles specific to the adoption and use of AI. For example, taking into account the availability of AI-enabled diagnostic and placement technologies, derive, from the district's commitment to eliminating discrimination wherever possible, a principle that potential discrimination in AI-enabled technologies should be evaluated and controlled.
- **Inputs:** The technology landscape developed in *Step 1* and the summary of core values created in *Step 2*. These inputs may be supplemented, as useful, by other guidelines for responsible use identified in *Step 1*.
- **Participants:** State or district superintendents (and their staffs), with input gathered, as needed, from other stakeholders.
- **Output:** A set of principles guiding the adoption, use, and retirement of AI-enabled technologies in Ohio's schools.

STEP 4: DERIVING POLICIES FROM PRINCIPLES

The goal of this step is to arrive at actionable policies (broadly understood to include formal policies as well as standards, best practices, and guidance) for the governance of AI that will ensure that a school's use of AI adheres to the principles developed in *Step 3* (and, by extension, the values identified in *Step 2*). Arriving at these policies is itself a two-part process whereby, first, an inventory of evidence that might feasibly be collected and used to assess adherence of a given technology to a given principle is compiled and, second, a policy (or standard, best practice, or guidance) is formulated that incorporates that evidence in its criteria for assessing adherence. Key elements of this step may be summarized as follows:

- **Objective:** The creation of actionable, objectively assessable, policies governing the adoption, use, and retirement of AI-enabled technologies in a district or school.
- **Method:** First, based on the technology landscape developed in *Step 1*, create an inventory of the types of evidence generated by AI-enabled technologies (or by the users of those technologies) that might be used to assess a technology's adherence to the principles identified in *Step 3*. Second, formulate policies that enable an assessment of adherence to the principles based on the evidence identified in the inventory. For example, in support of the principle "potential bias in AI-enabled technologies should be evaluated and controlled," formulate a policy that uses a system's training data as an assessment criterion: *No AI-enabled diagnostic tool shall be adopted unless it can be demonstrated that the data used to train the tool are representative of the student population that will be assessed by the tool.*
- **Inputs:** The technology landscape developed in *Step 1* and the list of principles identified in *Step 3*. These inputs may be supplemented, as useful, by other resources on the capabilities and risks associated with AI (identified in *Step 1*).
- **Participants:** State or district superintendents (and their staffs), school principals, educators, IT directors, and information governance officers.
- **Output:** A set of policies governing the adoption, use, and retirement of AI-enabled technologies in a district or school.

STEP 5: PUTTING POLICIES INTO PRACTICE

The goal of this step is to put the policies formulated in Step 4 into practice. This step falls into two phases. The first, initial implementation, is the phase in which the logistics required for implementing a policy (including any training programs) are identified and addressed and the policy is implemented. The second, monitoring and feedback, is the phase in which a policy, after initial implementation, is monitored for effectiveness and the possible triggering of unintended adverse effects, and the policy, as needed, is updated on the basis of the information gained from that monitoring. Key elements of this step may be summarized as follows:

- **Objective:** Implementation of AI-focused policies in a manner that is effective and provides for ongoing assessment and improvement.
- **Method:** First, for a given policy, identify and address the practical conditions that may affect how the policy should be implemented. Conditions that may have to be addressed include ensuring that any tools or training needed for the effective implementation of the policy are provided. Second, implement the policy along with an ongoing monitoring, assessment, and feedback mechanism.
- **Inputs:** The policies developed in *Step 4* and information on the practical conditions of a school or district that may affect implementation mechanisms.
- **Participants:** State or district superintendents (and their staffs), school principals, educators, IT directors, information governance officers, and parents.
- **Output:** Functioning, assessable, policies governing the adoption, use, and retirement of AI-enabled technologies in a district or school.

SUMMARY OF STEPS

Figure 1 summarizes the step-by-step process for policy development.

Participants	Superintendents, supported, as needed byother stakeholders			
Inputs	Guidelines, Reports, Articles and Papers			
Step	**Step 1: Landscape Assessment**			
Outputs	A continually updated summary of the lay of the land with respect to (a) technology; (b) regulations; (c) internal resources			
Participants	Superintendents, supported, as needed by other stakeholders	Superintendents, supported, as needed by other stakeholders	Superintendents, Principals, Educators, IT Directors	Superintendents, Principals, Educators, IT Directors, Parents
Inputs	Mission Statements, Handbooks, Planning and Budget Documents	Technology Landscape, Summary of Core Values	Technology Landscape, Principles	AI-Government Policies, Practical Conditions
Step	**Step 2: Values**	**Step 3: Principles**	**Step 4: Formulate Policy**	**Step 5: Implement Policy**
Outputs	Summary of Core Values	A Set of AI-Specific Principles	A Set of AI-Governance Policies	Functioning, Assessable, AI-Governance Policies

Figure 1: Summary of Development Process for AI-Focused Policy

PART 2

INTRODUCTION TO RESOURCES FOR POLICYMAKERS, TEACHERS, AND PARENTS

In **Part 1** of this toolkit, we identified key steps on the pathway to the development of AI-focused policies that will be transparently anchored in, and advance, a school or district's core values and priorities. In the remainder of the toolkit, we address the question of the means for carrying out each of those steps. We do so by providing a survey of the resources that policymakers, teachers, parents, and other stakeholders may draw upon in executing the steps on the path from the identification of high-level aspirational values to the implementation of concrete policy directives.

The survey considers a wide range of resources, but focuses primarily on 21 sets of guidelines for the responsible use of AI: nine with a focus on the use of AI-enabled technologies generally and 12 with a more narrow focus on the use of AI-enabled technologies in schools. The guidelines included in the survey (the "Guideline Pool") are as follows.

General Guidelines:

- 2016 — **Partnership on AI** – PAI Tenets
- 2017 — Future of Life Institute – **Asilomar** Principles
- 2019 — **European Commission** – Ethics Guidelines for Trustworthy AI
- 2019 — **IEEE** – Ethically Aligned Design

2019 **OECD** – Recommendation of the Council on Artificial Intelligence

2021 **GOV.UK** – National AI Strategy

2022 **White House OSTP** – Blueprint for an AI Bill of Rights

2023 **Bletchley AI Safety Summit** – Bletchley Declaration

2023 **NIST** – AI Risk Management Framework

Education-Focused Guidelines:

2023 — **CA Department of Education** – AI in CA: Learning with AI, Learning about AI

2023 — **Consortium for School Networking (COSN)** – K-12 Generative AI Readiness Checklist

2023 — **EdSAFE** – Policy Guidance Framework

2023 — **Google for Education** – A Guide to AI in Education

2023 — **ISTE** – Bringing AI to School: Tips for School Leaders

2023 — **Michigan Virtual** – AI Integration Framework for Schools;[6]

[6] *Under MI Virtual 2023, we include the online **planning guide** that is associated with the framework document.*

2023 **OR Department of Education** – Generative AI in K-12 Classrooms

2023 **Stanford University, Policy Analysis for California Education** – From Reactive to Proactive: Putting Districts in the AI Driver's Seat

2023 **Yale: Poorvu Center for Teaching and Learning** – AI Guidance

2023 **TeachAI** – AI Guidance for Schools: Toolkit

2023 **UNESCO** – Guidance for Generative AI in Education and Research

2023 **US Department of Education** – AI and the Future of Teaching and Learning.

The survey is divided into five parts, each of which provides a different perspective on the relevant resources. ***Part 3***: *Resources for Policymakers – A Functional Overview* is designed to identify which resources may be most helpful in assisting policymakers in carrying out each of the steps along the policy-development pathway sketched in *Part 1*; it is accordingly organized per the steps on that path. ***Part 4***: *Resources for Teachers* takes the perspective of teachers and seeks to provide direction to resources that can aid in their efforts to take advantage of the benefits that AI-enabled tools can bring to their instructional efforts while also mitigating the risks attendant on those technologies. ***Part 5***: *Resources for Parents* brings parents into the picture and considers resources that can aid in their efforts to partner with their schools in ensuring that their children are well-prepared for a world in which AI is ubiquitous. ***Part 6***: *A Guide to Guidelines* is organized as a simple list of resources; it is designed to provide, for any category of stakeholder, a summary of the key features (scope, focus, perspective, and strengths) of each of the relevant guidelines. The survey of resources concludes (***Part 7***: *Summary of Resources*) with a summary of the areas of focus of each of the guidelines discussed in this toolkit (from the perspectives of policymakers, teachers, and parents).

PART 3

RESOURCES FOR POLICYMAKERS – A FUNCTIONAL OVERVIEW

In this part of the toolkit, we adopt a functional perspective on the various resources available to stakeholders and ask what those resources can contribute to each of the steps on the path to policies that will ensure the safe and effective use of AI in Ohio's school districts and individual schools. By way of review, the policy-development steps identified in ***Part 1*** (and covered here) are the following:

- **Step 1:** Taking stock of the landscape;
- **Step 2:** Identifying high-level values and goals;
- **Step 3:** Deriving principles from values;
- **Step 4:** Deriving policies from principles; and
- **Step 5:** Putting policies into practice.

STEP 1: LANDSCAPE ANALYSIS

Almost all the documents in the Guideline Pool provide some amount of landscape analysis (see discussion of **Step 1** above). Resources stakeholders may find particularly helpful include the following:

- **On the Technology Landscape**
  - **ISTE 2023.** Provides (*see pp. 2-4*) a good, high-level, introduction to AI, how it works, and its primary varieties. It also provides a brief overview of specific AI-enabled applications (including those designed for teaching and learning) that stakeholders will want to ensure are within the scope of their governance efforts.
  - **UNESCO 2023.** Provides (*see pp. 8-13*) a good introduction to Generative AI (Gen AI) technologies. Specific topics covered include the historical development of the technologies, the range of Gen AI technologies currently available (for both text and image generation), the role of prompt engineering, and the development of foundational models intended specifically for educational applications.

- **On Normative Landscape**

  - **COSN 2023.** Focused on Gen AI, CoSN 2023 provides a set of questions designed to enable stakeholders to assess their readiness to address the issues raised by using the Gen AI technologies in their schools and districts. Included among the questions is a set (under *Legislative and Administrative Rules*) focused specifically on the need for awareness of the prevailing normative landscape; e.g.:

    Do your state laws or school district's rules specifically allow for the use of Gen AI for business and administrative use within the districts?

  - **TeachAI 2023.** Provides the results of survey data that offer a window on the current normative context within which education-focused AI applications would be adopted; e.g.:

    2% of state edtech leaders say their state has an AI initiative.

    55.1% of officials said they are seeing an increased interest in guidance or policy around the use of AI in the classroom compared to last year.

    Half of teachers report a student has had negative consequences for improper use of AI.

- **On the Internal Landscape**

  - **MI Virtual 2023.** MI Virtual 2023 emphasizes (in the **Planning Guide**) the importance of establishing a cross-functional team dedicated to addressing the challenges of AI integration and the associated needs of policy development and implementation; e.g.:

    To effectively integrate AI in a district, it is crucial to establish an internal implementation team of various stakeholders from throughout the district. AI integration will conceivably affect every department within a school district, so ensuring those departmental perspectives are represented is important.

- **COSN 2023.** CoSN 2023 also provides helpful questions (under *Strategy*) focused on assessing whether a school or district has gathered the resources needed to conduct a meaningful landscape analysis; e.g.:

  Do you have a cross-functional team (i.e. Technical, Operational, Academic, Financial, Legal, Administration, Communications, Students & Parent Representatives) that provides oversight and guidance on the procurement, adoption, implementation, management of, and communication about Gen AI in your district? Is your Team … [r]esponsible for researching and aligning with organizations, including the White House & U.S. Department of Education, that are developing best practices for the use of Gen AI in K12 districts?

- **Also see:** EdSAFE 2023.

STEP 2: IDENTIFICATION OF CORE VALUES

Most of the resources in the Guideline Pool make some reference to the need to make sure that policy is aligned with core values or objectives. Identification and discussion of specific values (see discussion of **Step 2** above) is less frequent. Resources stakeholders may find particularly helpful include the following:

- **On society-wide values and objectives**

- **OECD 2019.** Among the values OECD 2019 identifies as priorities for protection and advancement are *human-centered values and fairness* (Principle 1.2). Elaborating on how it intends these terms to be understood, the document lists "fundamental freedoms, equality, fairness, rule of law, social justice, data protection and privacy, as well as consumer rights and commercial fairness."

- **On education-specific values and objectives**

- **US DOE 2023.** US DOE 2023 identifies a set of four foundational values that guide its discussion of how to integrate AI into teaching and learning. These include:

  Foundation 1: Center People (Parents, Educators, and Students);

  Foundation 3: Ensure Safety, Ethics, and Effectiveness.

MI Virtual 2023. Among the values most often cited in education-specific guidance on the use of AI are fairness and the avoidance of bias. MI Virtual 2023's focus on addressing questions of "access for all student populations" (under *Policy, Ethical, & Legal Considerations*) is an example of the prioritization of this value (see also the associated ***Planning Guide***).

Also see: EC 2019; OSTP 2022; UNESCO 2023.

STEP 3: DERIVATION OF PRINCIPLES

Principles (see discussion of **Step 3** above) are at the heart of most of the AI governance efforts undertaken to date[7] and almost all the resources in the Guideline Pool have them. Some principles bear directly on a value; e.g., a principle that requires *fairness* in access to AI-enabled tools. Other principles bear indirectly on values; e.g., a principle that requires competence of the operators of an AI-enabled system, where competence is not a core value in itself, but serves trust that the system is being operated in a manner fit for its intended purpose (and thus consistent with applicable values). In this overview of resources, we distinguish among five types of principles: (1) those focused directly on values and those focused indirectly on values through a primary focus on (2) safety, (3) innovation, (4) trust, and (5) education. Resources stakeholders may find particularly helpful include the following:

For value-oriented principles

Asilomar 2017. One of the earliest sets of guidelines for the responsible use of AI, Asilomar 2017, articulates 23 principles focused on three areas: (1) research issues; (2) ethics and values; and (3) longer-term issues.[8] An example of those focused on ethics and values is:

> **Principle 12: Liberty and Privacy.** The application of AI to personal data must not unreasonably curtail people's real or perceived liberty.

[7] *For an analysis of 36 sets of guidelines and the common themes among them, see Fjeld, J., Achten, N., Hilligoss, H., Nagy, A., & Srikumar, M. (2020). Principled artificial intelligence: Mapping consensus in ethical and rights-based approaches to principles for AI. Berkman Klein Center Research Publication, (2020-1).*

- **For safety-oriented principles**
  - **Bletchley 2023.** The Bletchley Declaration, published in November of 2023, focuses on the safety requirement, connecting that requirement with other value-oriented conditions.

    AI should be designed, developed, deployed, and used, in a manner that is safe, in such a way as to be human-centric, trustworthy and responsible.

- **For innovation-oriented principles**
  - **UK 2021.** Under the category of innovation-oriented principles may be grouped those intended to ensure that governance policies respect the need to advance economic prosperity and industrial strength. A key pillar of the national AI strategy articulated in UK 2021 is one that provides for financing of AI-related research and innovation; see: ***Pillar 1****: Investing in the long-term needs of the AI ecosystem.*

- **For trust-oriented principles**
  - **IEEE 2019.** The Law Chapter of IEEE 2019 provides a good discussion of four trust-oriented principles: **effectiveness**, **competence**, **transparency, and accountability**. While the context of the discussion is the law, it is largely applicable also to the trustworthy adoption and use of AI in the service of education.

- **For education-specific principles**
  - **TeachAI 2023.** For education-specific principles, a good place to start is the set of seven principles advanced in TeachAI 2023. Examples include:
    - **Principle 1: Purpose.** Use AI to help all students achieve educational goals.
    - **Principle 3: Knowledge.** Promote AI literacy.
    - **Principle 5: Integrity.** Advance academic integrity.

[8] *For additional discussion and commentary on Asilomar 2017, see Boddington, P. (2017). Towards a code of ethics for artificial intelligence (pp. 27-37). Cham: Springer: 104-111.*

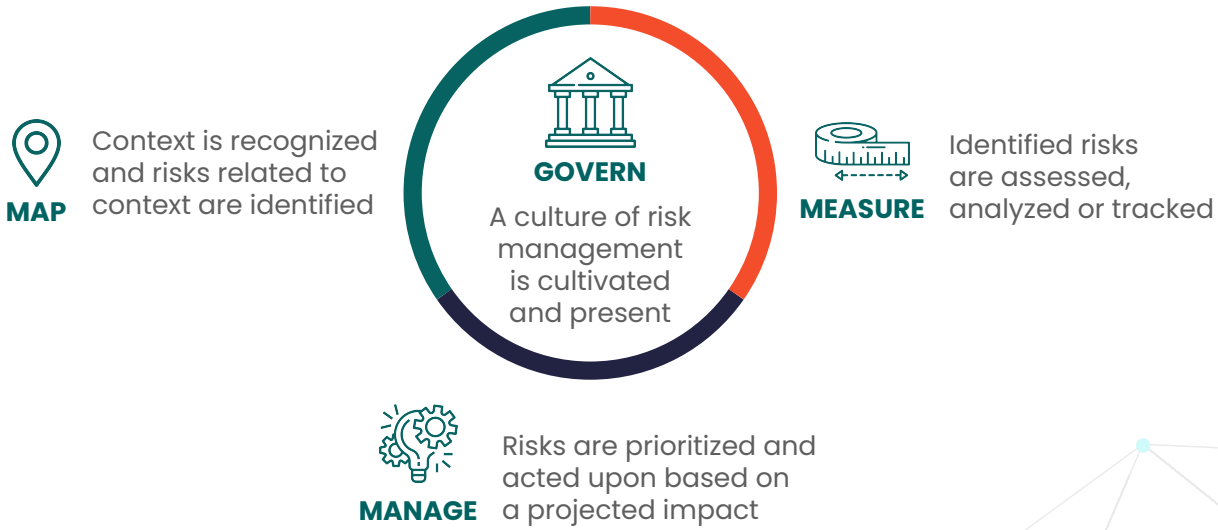
Also see: UNESCO 2023 (see, in particular, *Section 4: Towards a policy framework for the use of generative AI in education and research*); US DOE 2023.

STEP 4: FORMULATION OF POLICIES

The question of operationalization (see discussion of Step 4 above), or how to put principles into practice, is a challenging one (made still more challenging by the sparseness of reliable results from evaluations of AI-enabled systems applied in real-world contexts (see below on *Gaps in the Discussion*) and one to which the resources in the Guideline Pool, both those with a general focus and those with an education-specific focus, generally give insufficient attention. Some resources do address the question, however. Resources stakeholders may find particularly helpful include the following:

General

NIST 2023. NIST 2023 recognizes the central role of measurement in the effective management of the risks associated with AI, and hence the central role of measurement in the development of effective AI governance policies. At the core of the AI Risk Management Framework proposed in NIST 2023 is a mechanism enabling the interaction of four key functions: govern, map, measure, and manage; the diagram below (reproduced from NIST 2023) illustrates the place of measurement in the development of effective governance policies.



- **Education-Specific**

  - **EdSAFE 2023.** Of the education-specific guidelines in the Guideline Pool, EdSAFE 2023 is a good place to start on methodological questions. It outlines a well-thought-out approach to policy development for the use of AI in education, articulating a step-by-step method for proceeding from high-level goals to actionable policy (aligned, in general, with the approach outlined in this toolkit).

  - **Also see: UK 2021** UK 2021 (in particular, the proposal to pilot an "AI Standards Hub" under the rubric of *Pillar 3: Governing AI Effectively*).

Gaps in the discussion. As noted above, a key element in the formulation of effective policy is the identification of evidence by which to evaluate adherence to the principles instantiated in a policy. In the case of AI-enabled systems, however, both those designed for application in education and those designed for application in other domains, there is, as yet, no ongoing program of evaluations of the effectiveness of the technologies as applied in real-world settings. A sparsity of evaluations means a sparsity of reliable evidence of effectiveness, hence the existence of an "evidence gap" that poses a challenge to effective policy formulation.

There is some reason for optimism, however, as there is increasing recognition of the evidence gap and the need to remedy it. For example, in the US-EU Trade and Technology Council's ***Joint Roadmap*** *on Evaluation and Measurement Tools for Trustworthy AI and Risk Management* (December 2022),[9] the parties to the roadmap state their commitment to take steps towards:

Interoperable tests and evaluations of AI risks: Evaluations strengthen research communities, establish research methodology, support the development of standards, and facilitate technology transfer. Evaluations inform consumer choice and facilitate innovation through transparency of system functionality and trustworthiness and can be used for compliance tests. A significant challenge in the evaluation of trustworthy AI systems is that context of deployment matters. For example, accuracy measures alone do not provide enough information to determine if a system is acceptable to deploy. The accuracy measures must be evaluated based on the context within which the AI system operates and the associated harms and benefits that could occur.

Other challenges include the quickly moving state of the art, the diversity of architectures of AI systems, and the complex behavior and emergent capabilities of large deep learning systems. New joint efforts in AI tests and evaluations are expected to focus on trustworthiness characteristics of system performance in addition to metrics such as accuracy.

STEP 5: IMPLEMENTATION OF POLICIES

As noted earlier, most of the resources in the Guideline Pool stop at the articulation of principles; there are some, however, that address questions of policy implementation (see discussion of **Step 5** above). What is important to recognize with regard to this step is that success in implementation is dependent on what is done both *before* and *after* the enactment of the policy. Before implementation, it is necessary to ensure that the infrastructure (tools, processes) needed to operationalize the policy is in place and that those charged with implementing the policy have been given appropriate training. After implementation, it is necessary to ensure that monitoring and feedback mechanisms (from all those engaged in or affected by the use of a tool, including administrators, educators, parents, and students) are in place so that the policy can be adapted as needed. Resources stakeholders may find particularly helpful include the following:

- **TeachAI 2023.** Recognizes the need to support policy with appropriate training. With deeper and more widely distributed competence in AI comes both better execution of policies and better recognition of the need to fill gaps where policy is lacking. For example, in support of the organizational learning that can serve as the foundation for effective policy and risk mitigation, TeachAI 2023 advocates that schools and districts:

  Prioritize professional development for all staff.

  Bring together individual educators' experiences with AI to document successes, identify gaps, and build collective organizational knowledge and capacity.

  Include operational considerations such as evaluating AI tools already in use and creating selection criteria for future evaluations.

- **PACE 2023.** Provides a good discussion of the importance of support activities undertaken before, during, and after implementation in ensuring that the goals of a policy are met. A particular emphasis is on the need for training and support of both those overseeing the implementation of a policy and those expected to adhere to it; e.g. (from the section headed *Turning Early Adopters' Learning Into Organizational Learning*):

  As soon as possible—even before finalizing their policies—districts need to enter a second stage focused on supporting and consolidating learning about AI that will facilitate the development of good policies as well as long-term improvement. … If districts coordinate learning successfully, this can support policy development, teachers' learning across the board, and, ultimately, organizational improvement.

- **Also see: COSN 2023**; **EdSAFE 2023**.

PART 4

RESOURCES FOR TEACHERS

Part 3 of this toolkit provides policymakers with a guide to the tools and sources of information that will aid them in their efforts to turn abstract principles into actionable policy. Policies, however, even well-formulated ones, will not have their intended impact unless they are implemented effectively. Effective implementation requires the informed and competent engagement of the practitioners on the ground who are charged with putting the policies into practice. In the case of educational policy, those crucial ground-level practitioners are, most often, teachers.

Part 4 of this toolkit turns its attention to teachers and provides direction to resources that can aid in their efforts to take advantage of the benefits that AI-enabled tools can bring to their vocation while also furthering applicable policy objectives and mitigating the risks attendant on those technologies.[10] *The resources are discussed under three rubrics: (1) Background, (2) AI in the Classroom, and (3) Practical Templates and Tools.*

Background

Introductions to AI

AI 101. From **aiEDU**, a high-level overview of what AI is, where it is deployed, and why it is important to be "AI literate."

AI in 5 Minutes. From **aiEDU**, a brief introduction to AI: what it is, how it works, and what needs to be considered in ensuring that it is used in a safe, effective, and ethically responsible manner.

Intro to AI. From **aiEDU**, a 10-week project-based learning course that introduces the fundamentals of AI through engaging, culturally relevant lessons.

What is AI? (see p. 2). From **ISTE**, a high-level introduction to what AI is and is not.

[10] *The resources cited in this section are intended simply as a launching point for teachers' explorations of ways to integrate AI into their classroom instruction and practices. Valuable additional information will be found throughout the guidelines discussed elsewhere in this toolkit (see Part 6: A Guide to Guidelines) and in other resources to which those guidelines point.*

Applications of AI

- **AI Topics**. From **aiEDU**, an overview of the domains in which AI-enabled tools are being applied.
- **Examples of Generative AI Tools to Explore** (see p. 4). From **ISTE**, a pointer to Gen AI tools of relevance to educators.

Glossaries

- **Glossary of Terms** (see p. 15). From **CoSN** and **CGCS**, a glossary of terms of art used in CoSN's K-12 Generative AI Readiness Checklist (from **CoSN 2023**).
- **Glossary of AI Related Terms** (see Appendix G). From **Michigan Virtual**, a glossary designed for educators and school board members seeking to integrate AI in their programs.
- **Glossary** (see p. 36). From the **European Commission**, a glossary of AI-related terms used in its 2019 guidelines (from **EC 2019**).
- **Techniques Used in Generative AI** (see Table 1). From **UNESCO**, a brief glossary of technical terms used to characterize types of AI and their components.
- **Common Acronyms and Abbreviations** (see p. 62). From the **Office of Educational Technology** in the **US Department of Education**, a brief glossary of acronyms used in discussions of AI and its governance.

FAQs

- **Frequently Asked Questions** (see p. 6). From **ISTE**, suggested responses to questions commonly asked about the use of AI in schools.

AI in the Classroom

General Guidance

- **Strategies for Success** (see p. 3). From **ISTE**, suggested approaches to the safe and effective incorporation of AI in the classroom.
- **AI Guidance for Teachers**. From Yale's **Poorvu Center for Teaching and Learning**, guidance on what AI (especially Gen AI) is and how it can be incorporated transparently and effectively in the classroom.

Specific Content

- **AI Snapshots**. From **aiEDU**, an assortment of classroom warm ups that will give your students a basic understanding of AI.
- **AI Activities**. From **aiEDU**, a set of three classroom activities designed to prompt discussion about both the benefits and risks presented by AI.
- **AI Challenges**. From **aiEDU**, a set of hands-on challenges designed to deepen learners' understanding of the capabilities and limitations of AI.
- **Project Dashboard**. From aiEDU, a set of engaging projects designed to introduce high school students to the opportunities and challenges presented by AI.

Resources for Ongoing Professional Development

- **PD Sessions**. From **aiEDU**, a set of professional-development sessions covering a range of AI-related topics.
- **Educator Newsletter**. From **aiEDU**, a monthly newsletter covering latest developments in AI and resources available to educators.

Practical Templates and Tools

Templates

- **Letter to Administration**. From **aiEDU**, a template for a letter seeking support for the responsible incorporation of AI in classroom instruction.
- **Recommended Language for Acceptable Use Policy (AUP)** (see Appendix B). From **Michigan Virtual**, suggested language for an AI-focused addendum to an existing AUP.
- **Sample Student Agreement on the Use of AI** (see p. 42). From **TeachAI**, a template for an agreement documenting a student's commitment to the responsible use of AI.
- **Addressing Generative AI on Your Syllabus** (see section with this title). From Yale's **Poorvu Center for Teaching and Learning**, recommended language for clarifying course policy on the use of AI.

Questionnaires and Checklists

- **K-12 Generative AI Readiness Checklist**. From **CoSN** and **CGCS**, a list of questions designed to assess a school's AI readiness in specific issue areas. While designed primarily for school and district leaders, teachers may find the checklist helpful in assessing the state of AI readiness in their schools.
- **Trustworthy AI Assessment List** (see pp. 26ff.). From the **European Commission**, a checklist of specific questions to consider in assessing whether a given implementation of AI meets conditions of trust (from **EC 2019**).

PART 5

RESOURCES FOR PARENTS

Part 4 of this toolkit provides teachers with direction to resources that can aid in their efforts to integrate AI in their classroom instruction and practices in a safe, effective, and responsible manner. AI-enabled tools, however, are often, by design, multi-use: they have application in the classroom, but also outside the classroom, as students take advantage of the capabilities of such tools in pursuing their own social, intellectual, and recreational interests. Given the nature of these tools, and the increasing accessibility of students to them, it becomes more important than ever to bring parents into the picture. Safe and effective use of AI in schools requires a partnership between parents and teachers.

Part 5 of this toolkit turns its attention to parents and provides direction to resources that can aid in their efforts to understand the capabilities and risks presented by AI-enabled technologies and to partner effectively with schools to ensure that their children are prepared to function productively and safely in an AI-enabled world. While some of the resources cited are designed primarily for teachers and school leaders, they also offer a very valuable grounding for parents seeking to be informed partners in the integration of AI in their children's lives and education. The resources are discussed under three rubrics: (1) *Background*, (2) *AI in the Classroom*, and (3) *Practical Templates and Tools*.

Background

Introductions to AI

AI 101. From **aiEDU**, a high-level overview of what AI is, where it is deployed, and why it is important to be "AI literate."

AI in 5 Minutes. From **aiEDU**, a brief introduction to AI: what it is, how it works, and what needs to be considered in ensuring that it is used in a safe, effective, and ethically responsible manner.

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Frequently Asked Questions (see p. 6). From **ISTE**, suggested responses to questions commonly asked about the use of AI in schools.

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- **Project Dashboard**. From **aiEDU**, a set of engaging projects designed to introduce high school students to the opportunities and challenges presented by AI.

Practical Templates and Tools

- **Letter to Administration**. From **aiEDU**, a template for a letter seeking support for the responsible incorporation of AI in classroom instruction.
- **Sample Student Agreement on the Use of AI** (see p. 42). From **TeachAI**, a template for an agreement documenting a student's commitment to the responsible use of AI.

PART 6

A GUIDE TO GUIDELINES

Parts 3 – 5 of this toolkit provide perspective-specific guidance to resources: from the perspective of policymakers (**Part 3**), from the perspective of teachers (**Part 4**), and from the perspective of parents (**Part 5**). There may also be times, however, when a practitioner wants a simple inventory of resources, independent of any specific perspective or framework. Part 6 of the toolkit is intended to provide this view.

Part 6 provides, for each of the 21 resources included in the Guideline Pool, a brief summary of its content and key contributions. More specifically, the summaries provide, for each guideline covered, the document's URL, its scope, a summary of its content, and a brief description of its key contributions. *Part 6* begins with summaries of the guidelines focused on educational applications of AI; these are followed by summaries of general guidelines for the responsible use of AI.

Education-Focused Guidelines[11]

CA DOE 2023: CA Department of Education – AI in CA: Learning with AI, Learning about AI

URL: here.

Scope: AI (all varieties), applied in education.

Intended Audience: District and school leaders (superintendents, principals, and educators).

Summary: CA DOE 2023 provides a general overview of AI, its potential uses in school (teaching with AI), and the need for it to be taught in schools (teaching about AI). Its focus is less on the development of enforceable policies and more on building greater awareness of potential benefits (and associated risks) of incorporating AI in classroom instruction and school operations and of the importance of equipping students with the skills to understand and use AI-enabled technologies.

[11] *These guidelines are generally intended for an audience that includes teachers but also extends to other stakeholders in the educational system (state and district superintendents, school principals, IT and information security directors, parents, and citizens generally).*

- Specific topics covered include:
  - Fundamental skills for educators and students;
  - Utilizing AI in schools;
  - Developing AI in schools
- **Key Contributions:** Features of CA DOE 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:
  - **Demystification.** CA DOE 2023 emphasizes the importance of demystifying AI-enabled technologies for both teachers and students, as it is only on the basis of a clear-eyed understanding of how the technologies work and of their real capabilities and limitations that they can be used safely, efficiently, and effectively. For example, in the case of students:

    Building a foundational understanding of how AI systems work and produce output not only prepares students for future careers in computer science and technology-related fields, but it also ensures that all students enter the workforce as knowledgeable, resourceful consumers of AI. A strong conceptual understanding of AI empowers students to adapt and contribute to an evolving workforce (pp. 8-9).

  - **Safety Evaluation Steps**. CA DOE 2023 outlines an eight-step approach to assessing the safety of AI-enabled systems deployed in a school or district, covering questions related to data privacy compliance, transparency, and data retention, among others. While the discussion remains at a rather high level, it does serve as a good place to start in scoping out the issues that must be addressed in managing AI safety

Importance of teaching *about* AI. CA DOE 2023 is effective at conveying not only that students should learn about AI but also why they should learn about AI.

COSN 2023: Consortium for School Networking – K-12 Generative AI Readiness Checklist

URL: here.

Scope: Generative AI, applied in education

Intended Audience: District leaders (superintendents, district leaders, educators, IT directors, and information-security officers)

Summary. Taking the form of a self-assessment questionnaire, CoSN 2023 is a tool designed to assist district leaders in assessing their readiness for the effective and responsible adoption of Gen AI technologies (both for instructional and administrative purposes) in their schools. Each of the questions on the questionnaire is designed to draw stakeholders' attention to a specific issue or consideration that should be addressed in incorporating Gen AI in their instructional or administrative practices. Areas covered by the questions include:

Executive Leadership Readiness

- Strategy
- Legislation and Administrative Rules
- Use Policy
- Equity

Operational Readiness

- Procurement
- Staffing

Data Readiness
- Data Governance
- Data Quality
- Data Privacy

Technical Readiness
- Identity and Access Management
- Tracking & Monitoring
- Technical Controls
- Hallucinations of Inappropriate Content

Security Readiness
- Security Safeguards
- Cybersecurity Training

Legal/Risk Management
- Legal Remediation
- Risk Management
- Loss Notification

CoSN 2023 does not provide guidance as to what would be "good" or "bad" answers to the questions on the checklist (or, more precisely, what answers would be indicative of a high level of AI readiness and what answers would not). The purpose of the checklist is simply to raise awareness of the need to address the issues highlighted by the questions.

Key Contributions: Features of CoSN 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

Questions are a good starting point for assessing one's current state and identifying what needs to be done to reach one's desired future state. In this regard, the CoSN 2023 questions serve as a useful guide to executing what this toolkit has called Step 1 (initial landscape assessment).

- The questions are, in aggregate, comprehensive, covering a range of topic areas (from technical to legal) that must be addressed by those interested in the responsible adoption and use of AI. The questions are, individually, pointed, drawing attention to specific issues that stakeholders must not overlook.
- A specific need highlighted by the questions is the need for a multifunctional approach. No one individual could be expected to answer all the questions on the list; multiple competencies and perspectives are needed to answer the questions, indicating, more substantively, that that range of competencies is also needed for the safe and effective incorporation of AI-enabled technologies in a school.
- The question format lends itself to adaptation to circumstance. Adaptability is a feature that is essential to any tool that will meet the needs of Ohio's diverse educational system.

EdSAFE 2023: EdSAFE – Policy Guidance Framework

- **URL:** EdSAFE's Policy Guidance Framework is forthcoming; the EdSAFE website is **here.**
- **Scope:** AI (all varieties), applied in education.
- **Intended Audience:** District and school leaders (superintendents, principals, IT coordinators, and teachers).
- **Summary:** EdSAFE 2023 provides a well-thought-out approach to policy development for the use of AI in education. It is strong on methodology, articulating a step-by-step method for proceeding from high-level goals to actionable policy. The document is also complex and long, however, which raises questions about its usefulness as a guide for an audience that might find it daunting to digest and implement.

Key Contributions: Features of EdSAFE 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

Methodology. EdSAFE's strongest point is the articulation of a methodologically sound approach to the development of policy (see the seven stages on p. 4), a feature lacking in other guidelines. The approach coincides, in many ways, with the approach advocated in this toolkit, one that derives policy in a step-by-step fashion from high-level goals.

Distinctions (terminological and conceptual). It is also strong in drawing important distinctions (e.g., distinctions between general AI principles vs. education-specific AI principles, between near-term issues and medium- and long-term issues) that help clarify how to prioritize and address the many questions raised by the use of AI in education.

Additional Resources. EdSAFE 2023 contains, in its appendices, discussion of a number of resources that stakeholders would likely find valuable (e.g., an overview of data protection guidelines and regulations, such as GDPR).

GFE 2023: Google for Education – A Guide to AI in Education

URL: here.

Scope: AI (all varieties), applied in education.

Intended Audience: District and school leaders (superintendents, district leaders, educators, IT directors, and information-security officers).

Summary: GFE 2023 is a high-level introduction to AI-enabled tools for use by schools and educators, with a focus on tools that Google offers. While it does include some discussion of applying general AI-use principles to the use of AI in education, the focus of the document is less on the development of AI-related policy and more on the fetaures of Google's education-related offerings.

Key Contributions: Features of GFE 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Concise Introduction.** GFE 2023 is a simple introduction to AI and AI-enabled tools for education. Clear and concise (e.g., the section *Breaking down AI, ML, LLMs, and gen AI*),tthe document assumes no prior knowledge about what AI is or how it may be applied in education.

- **Principles.** Drawing upon Google's general principles for the responsible use of AI, GFE 2023 derives some education-specific questions stakeholders can ask is assessing whether a given tool is being used safely, effectively, and ethically. Example questions include:

  Is it clear to educators and students what the benefits of using [the tool] are, and where and how to start?

  Is the educator looped into the student experience to help shape and guide (if needed)?

- **Direction to other resources.** GFE 2023 contains links to resources that will be helpful for readers seeking greater depth on a given topic (e.g., an AI Literacy Guide).

ISTE 2023: ISTE – Bringing AI to School: Tips for School Leaders

URL: here.

Scope: AI (all varieties, but with a primary focus on Generative AI), applied in education.

Intended Audience: District and school leaders (superintendents, principals, educators).

Summary: ISTE 2023 provides a brief, high-level, introduction to AI (and, more specifically, Gen AI), its applications in school, and some of the considerations school leaders and educators should take into account in making responsible and effective use of those applications and that parents should be aware of in assessing a school's use of AI. Not meant as a detailed policy-development roadmap, it serves rather as a jumping-off point for stakeholders in the initial stages of exploring applications of AI in education and the governance mechanisms they require.

Key Contributions: Features of ISTE 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **What AI is not.** In defining what AI is, ISTE 2023 also reminds readers what AI is not (i.e., it's not "magic"). Reminders such as this help stakeholders keep their feet on the ground and maintain a practical perspective in addressing the issues raised by AI.
- **Examples of Gen AI tools with potential application in education.** ISTE 2023 provides a brief (one-page) overview of Gen AI tools (with specific applications organized into four categories) that have potential application in student research, classroom instruction, or prep work for classroom instruction.

- **Direction to other resources.** While ISTE 2023 itself is brief, it directs readers to other resources (mostly other ISTE resources) that provide more in-depth discussion on various topics (e.g., *Setting Conditions for Success: Creating Effective Responsible Use Policies for Schools*).

- **Alignment with ISTE standards.** ISTE 2023 (see Strategy 4: Host Conversations) cross references AI-related topics educators might want to explore with the ISTE standards relevant to those topics.

MI Virtual 2023: Michigan Virtual – AI Integration Framework for Schools

- **URL:** here. Under the rubric of MI Virtual 2023 we include, along with the framework document, the associated planning guide (available here).

- **Scope:** AI (all varieties), applied in education.

- **Intended Audience:** District and school leaders (superintendents, district leaders, educators, IT directors, and information-security officers).

- **Summary:** MI Virtual 2023 provides a description of destinations (future states) on the path to successful integration of AI into a school or district's instructional and administrative functions. The requirements of integration are considered along eight specific tracks, with state of readiness viewed, for each track, in the near term (*investigating*), medium term (*implementing*), and long term (*innovating*). The eight tracks considered are:

  - Leadership & Vision;
  - Policy, Ethical, & Legal Considerations;
  - Instructional Framework;

- Instructional Framework;
- Measuring Student Learning & Assessments;
- Professional Learning;
- Student Use;
- Business & Technology Operations; and
- Outreach.

The framework document provides descriptions of the *what* (the destinations or states along the path to full integration), but does not describe the *how* (the means for going from one destination to the next). Guidance on the *how* is provided in the companion Planning Guide.

Key Contributions: Features of MI Virtual 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Function-specific readiness roadmap.** Some stakeholders have indicated that they would like a "roadmap" that describes the destinations to which AI readiness efforts are aiming and defines milestones to meet along the way. The MI Virtual 2023 framework, by describing readiness states along eight specific dimensions of AI integration, offers such a high-level roadmap.

- **Implementation guidance.** The *Planning Guide* that accompanies the *Framework* itself offers a number of considerations and tips for practitioners seeking to steer their school or district from one stage to the next. Though falling short of providing a robust and comprehensive methodology, the guidance will help practitioners (administrators, educators, parents) identify steps that can be taken to advance their objectives.

- **Practical resources (in Appendices).** The Planning Guide also includes a set of appendices that provides practitioners with practical tools, templates, and resources. Examples include recommended language for an addendum to an Acceptable Use Policy (Appendix B), a portrait of successful AI integration (Appendix D), a questionnaire to assess AI-related risk (Appendix E), and a glossary of AI-related terms (Appendix G).

OR DOE 2023: Oregon Department of Education – Generative AI in K-12 Classrooms

- **URL:** here.
- **Scope:** Generative AI, applied in education.
- **Intended Audience:** District and school leaders (superintendents, district leaders, principals, educators, IT directors, and information-security officers).
- **Summary:** OR DOE 2023 provides a general overview of Gen AI, its potential uses in schools, risks associated with those uses, and practical strategies and tips for managing those risks. Its focus is less on the development of enforceable policies and more on building greater awareness of the issues raised by Gen AI and providing educators and administrators with practical guidance and tips for addressing those issues. Though focused on Gen AI, much of the guidance is applicable to AI generally. Specific topics covered include:
  - Defining Gen AI
  - Privacy issues raised by the use of Gen AI tools
  - Potential classroom uses of Gen AI

- Initial considerations when developing policies governing the use of Gen AI

- **Key Contributions:** Features of OR DOE 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

  - **Usability.** At a user-friendly 11 pages, OR DOE 2023 serves as a brief but substantive introduction to Gen AI technologies and the issues raised by their use in schools. Links to other resources direct readers to more in-depth coverage of specific issues.

  - **Practical strategies.** Tables are included that provide educators (and other school leaders) with specific approaches to addressing questions of the impact of Gen AI technologies and to utilizing Gen AI instructional tools in the classroom (covering applications such as learning design, instructional support, educator assistance, student support and guidance, and laying foundations for future career options).

  - **Introduction to privacy policies.** The brief but helpful guide to policies relevant to privacy questions is a good place to start for understanding the scope of privacy-related issues. Links are provided to key federal and state policies related to privacy (FERPA, CIPA, COPPA, OSIPA).

PACE 2023: PACE – From Reactive to Proactive: Putting Districts in the AI Driver's Seat

- **URL:** here.

- **Scope:** AI (all varieties), applied in education.

Intended Audience: District and school leaders (superintendents, district leaders, principals, educators).

Summary: PACE 2023, a publication of Stanford's center for Policy Analysis for California Education, provides a high-level three-track roadmap for integrating AI into a school district. Though high-level, the document does suggest some concrete steps a district can take to achieve the objectives for each of the tracks. The three tracks are:

- Creating policy around AI;
- Turning early adopters' learning into organizational learning; and
- Using learning to guide improvement and transformation.

The first and second track can be initiated immediately and run in parallel; the third track is to be initiated after work on the first and second tracks has reached an appropriate level of maturity. Though geared for use by California schools in the 2023-2024 academic year, the roadmap is readily applicable to other jurisdictions and timeframes.

Key Contributions: Features of PACE 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Privacy considerations.** In discussing steps to be taken on the first track (creating policy), PACE 2023 highlights the importance of including privacy issues within the scope of the policy making effort, noting, in particular, the importance of ensuring compliance with the Family Educational Rights and Privacy Act (FERPA) and Children's Online Privacy Protection Rule (COPPA).[12]

[12] Both FERPA and COPPA are federal statutes. It is also important, of course, that districts ensure that their policies are in accord with state-mandated privacy protections.

- **Professional development.** PACE 2023 recognizes that effective policy around AI will also require professional development around AI ("it is critical that even before policies are set, districts provide professional development for educators and staff"). A baseline level of AI literacy among educators and other staff (and among parents) is both a precondition of effective policy implementation and, independent of policy, a means of identifying and containing AI-related risk.
- **Organizational learning.** In discussing the need to advance organizational learning about AI, PACE 2023 suggests some specific steps that a school district might take, such as requiring students to use AI for some assignments or conducting constrained pilot evaluations of specific tools.
- **Direction to other resources.** In discussing the third track (improvement and transformation), PACE 2023 offers helpful pointers to other resources districts may draw upon in meeting the objectives of this track.

Poorvu 2023: Yale: Poorvu Center for Teaching and Learning – AI Guidance

- **URL:** here.
- **Scope:** Gen AI, applied in education.
- **Intended Audience:** Primarily educators, but also district and school leaders responsible for the training and professional development of educators. Also could be helpful for parents seeking information on potential uses of Gen AI in schools.

- **Direction to other resources.** Poorvu 2023 provides direction to other resources that educators and parents may find helpful in exploring Gen AI and its possible uses in the classroom (see the section *Recommended Reading*).

TeachAI 2023: TeachAI – AI Guidance for Schools: Toolkit

- **URL: here**.[13]
- **Scope:** AI (all varieties), applied in education.
- **Intended Audience:** District and school leaders (superintendents, principals, IT coordinators, and teachers).
- **Summary:** TeachAI 2023 provides a good comprehensive introduction to the uses of AI in education, the risks associated with those uses, and the means for managing those risks. The fact that it covers a broad range of questions raised by the use of AI makes it a good starting point for stakeholders seeking to get an initial view of the opportunities and challenges AI presents to schools. Specific topics covered include:
  - What is Artificial Intelligence?
  - AI Benefits and Risks
  - Steps for Implementing AI
  - Seven Principles for AI in Education
  - Teaching With and About AI
  - Data on AI in Education

[13] *Under TeachAI 2023 we include reference to a presentation (AI in Education) that is a companion to the TeachAI toolkit. The presentation is available **here**.*

Key Contributions: Features of TeachAI 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

Summary of Operative Regulations. TeachAI 2023 provides (in the Resources section) a concise overview of current regulations relevant to AI in education (both international and domestic).

Data. TeachAI 2023 provides the results of survey data that offer a window on the current normative context within which education-focused AI applications would be adopted. Provision of these results advances the cause of better-informed, evidence-based decision-making.

Templates. TeachAI 2023 provides a number of templates for AI-related policies, agreements, communications with parents, and so on, that stakeholders can readily adapt and apply in their own circumstances.

UNESCO 2023: UNESCO – Guidance for Generative AI in Education and Research

URL: here.

Scope: Generative AI, applied in education.

Intended Audience: District and school leaders engaged in policy development or in professional development and training (superintendents, district leaders, educators, IT directors, and information-security officers).

Summary: UNESCO 2023 provides a solid introduction to Generative AI, its applications in education, and the risks associated with those applications. It lacks grounding in a comprehensive policy-development methodology and falls short on concrete practical guidance, but still serves as a broad and deep introduction to the issues raised by the use of Gen AI in education and to considerations that should be kept in mind in addressing those issues. Chapter headings include:

- What is generative AI and how does it work?
- Controversies around generative AI and their implications for education
- Regulating the use of generative AI in education
- Towards a policy framework for the use of generativeAI in education and research
- Facilitating creative use of GenAI in education and research
- GenAI and the future of education and research

Key Contributions: Features of UNESCO 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Coverage of risks associated with use of Gen AI in education.** UNESCO 2023 (in Chapter 2) provides a good overview of the downside risks of the use of Gen AI in teaching, learning, and research. These issues go beyond the immediately apparent questions of plagiarism and "hallucinations," to questions of fostering an artificial conformity of perspectives and creating impediments to understanding the real world. The chapter discusses the issues both in general and in regard to the application of the technology to education in particular.

Multi-stakeholder approach to policy development. UNESCO 2023 recognizes that sound AI policy requires a multi-stakeholder approach, both in terms of development (gaining the perspectives of a range of different actors who engage with an AI system over its lifecycle) and in terms of its application (ensuring that policy extends to all actors who may affect the outcomes generated by an AI sysem). In section 3.3 (*Regulations on GenAI: Key elements*), for example, UNESCO 2023 underlines that governmental regulatory agencies, providers of Gen AI tools, institutional users, and individual users all have important roles in the development and enforcement of policies related to AI applications used in education.

Recognition of the role of professional development. UNESCO 2023 recognizes that broadening and deepening AI-related competencies is an important component of an AI risk mitigation strategy, one that complements regulatory approaches. Section 4.4 (*Develop AI competencies including GenAI-related skills for learners*), for example, observes that "[t]he development of AI competencies among learners is key to the safe, ethical and meaningful use of AI in education and beyond." The section goes on to note five steps that educational agencies can take to advance the cause of achieving more broadly distributed AI competency.

US DOE 2023: US Department of Education – AI and the Future of Teaching and Learning

URL: here.

Scope: AI (all varieties), applied in education.

Intended Audience: Teachers, educational leaders, policy makers, researchers, and educational technology innovators and providers.

Summary: US DOE 2023 provides an introduction to AI, its role in education, risks associated with its use in education, means for managing those risks, and some consideration of future directions. At nearly 70 pages, it is able to discuss topics in greater depth than some of the higher-level overviews, providing readers, for example, with a broader and deeper grounding in the range of technologies that are included under the rubric of AI (see the chapter *What is AI*?). As such, some practitioners would find US DOE 2023 a good "second-stop" resource, one to come to after gaining some initial grounding from one of the lighter overviews. Topics covered by US DOE 2023 include:

- What AI is and how it works;
- Foundations of ethics-oriented policies;
- AI and learning;
- AI and teaching;
- AI in student assessment;
- Directions in research and development; and
- Principles for safe and effective use of AI.

Key Contributions: Features of US DOE 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Depth.** As noted above, US DOE 2023 discusses topics in some depth. One example is the discussion of AI's role in formative assessment.

The discussion considers how AI can improve the effectiveness of formative assessment, discusses some of the ethical challenges (e.g., bias) that must be addressed in using AI-enabled tools for assessments, and lists some questions the answers to which may shape future practices with regard to this application of AI.

Bringing technology providers into the picture. US DOE 2023 helpfully brings questions of AI research and development within the purview of the education profession. Safe and effective educational technologies require a productive interaction between educators, parents, and technologists, with teachers and parents helping technologists understand their needs and conditions and with technologists helping teachers and parents understand capabilities, limitations, and required competencies.

Values and principles. US DOE 2023 includes a discussion of both core values (which it calls *Foundations*) and AI-focused principles (which it calls *Recommendations*). A stakeholder need not agree with the specific values and principles on the DOE's list to find them a good starting point for arriving at the values and principles that are suited to the specific circumstance that motivates the stakeholder's inquiry.

General Guidelines

Asilomar 2017: Future of Life Institute – Asilomar Principles

URL: here.

Scope: AI (all varieties), no restriction on the domain of application.

Intended Audience: : All stakeholders in the responsible design, development, and use of AI-enabled technologies: researchers, designers, developers, operators; policymakers, industry associations, advocacy groups; the general public.

Summary: Asilomar 2017, one of the earliest sets of guidelines, represents the consensus view of a diverse group of stakeholders on guardrails needed to ensure the responsible development and use of AI. Consisting of 23 principles organized under three rubrics (Research Issues, Ethics and Values, and Longer-term Issues), the document is grounded in the recognition that we do not know the path that AI research will take or the capacities that future AI applications will have and therefore seeks to articulate general principles that, if adhered to, will contain AI-related risk.[14] Examples include:

Under **Research Issues:**
Science-Policy Link: *There should be constructive and healthy exchange between AI researchers and policy-makers.*

Under **Ethics and Values:**
Personal Privacy: *People should have the right to access, manage and control the data they generate, given AI systems' power to analyze and utilize that data.*

Under Longer-term Issues:
Capability Caution: *There being no consensus, we should avoid strong assumptions regarding upper limits on future AI capabilities.*

[14] For additional discussion and commentary on Asilomar 2017, see Boddington, P. (2017). Towards a code of ethics for artificial intelligence (pp. 27-37). Cham: Springer: 104-111.

Key Contributions: Features of Asilomar 2017 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Research focus.** Asilomar 2017 recognizes that mitigation of AI-related risk requires attention to research objectives and practices and not just to the after-the-fact regulation of AI applications.
- **Consensus.** Asilomar 2017 is the product of a process designed to find points of consensus among stakeholders with a broad range of perspectives; as such, the principles that were reached, though general, carry weight.
- **Discussion prompt.** Asilomar 2017 is intended to be a prompt for further discussion; as such, it is a good starting point for AI governance efforts, whether those of general scope or those focused on a specific domain such as education.

Bletchley 2023: Bletchley AI Safety Summit – Bletchley Declaration

URL: here.

Scope: AI (all varieties, but with an emphasis on "frontier" technologies (i.e., general-purpose AI)), no restriction on the domain of application.

Intended Audience: Primarily policymakers, but by implication all stakeholders in the safe design and operation of AI (researchers, designers, developers, operators, policymakers, and the general public).

Summary: Bletchley 2023, the output of the Bletchley AI Safety Summit of November 1-2, 2023, documents the agreement by 28 countries, plus the EU, on the need to take steps to ensure AI technologies (and, in particular, general-purpose varieties of AI) are designed and operated with safety as a primary objective. As might be expected from a document that represents the consensus of over 25 countries, the commitments made are rather general; nonetheless, the fact that 28 countries (plus the EU) could reach consensus on even general points with regard to AI safety gives weight to those points.

Key Contributions: Features of Bletchley 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

Linkage of safety to other values. Bletchley 2023 underlines that AI safety is not only an end in itself but also a means to other value-oriented goals:

> *... we affirm that, for the good of all, AI should be designed, developed, deployed, and used, in a manner that is safe, in such a way as to be human-centric, trustworthy and responsible.*

Focus on "frontier" varieties of AI. While there are a number of guidelines for the responsible use of AI, Bletchley 2023 is one of the first that reflects the advent of commercially viable technologies based on general-purpose, or foundational, models (for which safety issues are particularly acute).

Emphasis on evidence-based assessment of risk. Bletchley 2023 recognizes that consensus on the risks associated with AI and on how to manage those risks can be reached only based on reliable evidence. That means taking steps to facilitate:

> *Appropriate evaluation metrics, tools for safety testing, and developing relevant public sector capability and scientific research.*

An ongoing initiative. The 2023 Bletchley Declaration is the output of the Bletchley AI Safety Summit, which is intended to be the first in a series of AI Safety Summits (the next to be held in 2024).

EC 2019: European Commission – Ethics Guidelines for Trustworthy AI

URL: here.

Scope: AI (all varieties), no restriction on the domain of application.

Intended Audience: All stakeholders in the responsible design, development, and use of AI-enabled technologies, but with a particular focus on policymakers and AI designers and developers.

Summary: Among the EU's AI governance initiatives, the AI Act has, with good reason, been the primary focus of attention in recent years. EC 2019, however, an earlier publication of the European Commission, in many ways cleared the path for the AI Act by articulating many of the challenges to be considered in attempting to realize abstract AI principles in actionable policy. The document describes an operationalization framework that, similar to the one outlined in this toolkit, flows from the abstract to the concrete, from *Foundations of Trustworthy AI* (chapter 1) to specific requirements for *Realising Trustworthy AI* (chapter 2) and on to concrete tools that can be used in *Assessing Trustworthy AI* (chapter 3). EC 2019 thus remains a resource worthy of the attention of state and district education officials seeking direction on how to put core values and principles into practice in the form of actionable AI policy.

Key Contributions: Features of EC 2019 that stakeholders in the development of AI policy may find particularly helpful include the following:

A focus on trust. The question that animates EC 2019 is how we can trust that an AI-enabled system is compliant with our core, or foundational, values. This perspective highlights the need to incorporate trust-oriented requirements into any framework for the governance of AI. Among the trust-oriented requirements identified by EC 2019 are:

- *Human agency and oversight;*
- *Technical robustness and safety;*
- *Transparency;*
- *Accountability.*

Attention to requirements of organizational change. The practical perspective of EC 2019 brings to light the fact that the organizational change required to implement an effective AI governance regime requires the buy-in and contribution of many groups across the organization in question. Among the groups identified by EC 2019 are:

- *Management and Board;*
- *Compliance/Legal department/Corporate responsibility department;*
- *HR;*
- *Procurement;*
- *Day-to-day Operations.*

Recognition of tensions. EC 2019 recognizes that, at the point of operationalization, stakeholders in the responsible use of AI may find tensions among their guiding principles (a tension between explainability and effectiveness, for example, or between transparency and innovation). Arriving at an appropriate trade-off between the demands of principles in tension is not a matter of applying an abstract formula, but of applying "reasoned, evidence-based reflection rather than intuition or random discretion" (p. 13).

Practical tools and resources. EC 2019 provides practical resources that stakeholders may find helpful. For example:

- An **Assessment List** consisting of questions that practitioners can use in to assess the compliance their organization's use of AI with the seven requirements for trustworthy AI identified in EC 2019;
- A **Glossary** of terms and concepts relevant to the governance of AI.

IEEE 2019: IEEE – Ethically Aligned Design

URL: here.

Scope: AI (all varieties), no restriction on the domain of application.

Intended Audience: All stakeholders in the trustworthy design and use of AI (researchers, designers, developers, operators, policymakers, the general public).

Summary: IEEE 2019, a publication of IEEE's Global Initiative on Ethics of Autonomous and Intelligent Systems, is a wide-ranging but in-depth discussion of issues that must be addressed on the path to the development of normative instruments that will advance the ethical design and use of AI (or, in IEEE's preferred terminology, Autonomous and Intelligent Systems "A/IS"). Its goal is not to create policy but to lay the foundation for policy. It pursues that goal by first defining and discussing eight general principles for the ethical design and operation of AI (some of which are value-oriented (e.g., that on well-being), others of which are trust-oriented (e.g., that on effectiveness). That discussion is followed by a series of chapters, each of which fleshes out the general principles from a different perspective or domain of application. Topics covered by the chapters include:

- Classical Ethics in A/IS;
- Personal Data and Individual Agency;
- Methods to Guide Ethical Research and Design;
- Embedding Values into Autonomous and Intelligent Systems;
- Policy; and
- Law.

Key Contributions: Features of IEEE 2019 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **In-depth discussion of principles.** IEEE 2019 is intended to provide practical guidance. To that end, its discussion of principles does not stop with simply defining them. It goes on to flesh out the challenges of putting the principles into practice and the often-nuanced way those challenges have to be addressed (see, for example, the discussion of *effectiveness* in the chapter on law or the discussion of *transparency* in the same chapter).

- **Recommendations.** Every issue discussed is followed by a list of practical recommendations for addressing the issue. For example, included among the recommendations for advancing an informed trust in AI-enabled systems:
  Governments should set procurement and contracting requirements that encourage parties seeking to use A/IS in the conduct of business with or for the government … to adhere to the principles of effectiveness, competence, accountability, and transparency. (p. 222)

- **Range of perspectives and domains covered.** The range of perspectives from which the ethical issues are viewed and discussed offers valuable context for policymakers seeking to put principles into practice.

NIST 2023: NIST – AI Risk Management Framework

URL: here.

Scope: AI (all varieties), no restriction on the domain of application.

Intended Audience: Anyone who interacts with an AI system over the course of its lifecycle (from its planning and design all the way through to its use and eventual retirement). This very broad audience can be divided into two groups: (1) those directly engaged in the design, development, testing, and operation of an AI system and (2) those affected by the operation of the systems and those charged with managing the impact of the system (civic organizations, advocacy groups, policymakers, and so on).

Summary: NIST 2023 offers a framework for managing the risks associated with AI systems and for improving the trustworthiness of those systems. The framework is intended to equip both those engaged in the development of AI systems and those engaged in managing the effects of those systems with the conceptual tools needed to think through the challenges of diagnosing, measuring, and managing AI-associated risk. The framework is intended to be flexible in application, being adapted as needed to the circumstance.

Key Contributions: Features of NIST 2023 that stakeholders in the development of AI policy may find particularly helpful include the following:

Depth and specificity. NIST 2023 provides both depth and specificity in its analysis of AI-associated risk and the means for managing it. The granular analysis will help stakeholders find their place in the risk-management paradigm and better understand their roles in promoting the safe and effective design and operation of AI-enabled systems.

Focus on measurement. Not surprisingly from a NIST-published document, a primary focus of NIST 2023 is measurement: its role in risk mitigation, the challenges it presents, and the means for addressing those challenges. Stakeholders in the safe use of AI, whether in education or in other domains, will find this discussion essential in arriving at actionable and effective policies for the governance of AI.

Detailed taxonomy of AI actors. An AI system is complex, involving many actors over the course of its lifecycle. NIST 2023 (see Figure 3 and Appendix A) provides a detailed overview of the various individuals who engage with a system at each stage in its lifecycle. Stakeholders in the safe use of AI will find this analysis very helpful, as a means for ensuring that policies are comprehensive in their coverage of those who affect, or are affected by, the outcome of an AI system.

OECD 2019: OECD – Recommendation of the Council on Artificial Intelligence

URL: here.

Scope: AI (all varieties), no restriction on the domain of application.

Intended Audience: Policymakers, especially those in national governments.

Summary: OECD 2019 is a list of five principles for the responsible use of AI agreed to by the 38 member states of the OECD and 8 non-member states who have pledged their adherence.[15]

[15] At the time the agreement was reached in 2019, two current OECD members (Columbia and Costa Rica) were non-member signatories.

The principles are, by design, intended to be sufficiently robust and flexible to stand the test of time. Of the five principles, one is value-oriented (*Principle 2: Human-centered values and fairness*), one is innovation/prosperity-oriented (*Principle 1: Inclusive growth, sustainable development, and well-being*), one is safety-oriented (*Principle 4: Robustness, security and safety*), and two are trust-oriented (*Principle 3: Transparency and explainability; Principle 5: Accountability*). The five principles are further supported by five recommendations to governments regarding the implementation of the principles.

Key Contributions: Features of OECD 2019 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Simplicity.** The simplicity of the OECD principles (a set of five general principles) makes them useful as generally applicable touchstones for policymakers and other stakeholders in the responsible development, deployment, and operation of AI.
- **Implementation recommendations.** The five recommendations that accompany the principles go one step further than the principles, suggesting directions for policymaking in support of the principles. Though not policies themselves, they are a good starting point for governments considering AI-related policy.
- **Weight of the OECD.** Apart from any other considerations, simply the fact these principles have been agreed by the member states of the OECD (and some non-member states as well) gives them weight.

OSTP 2022: White House OSTP – Blueprint for an AI Bill of Rights[16]

URL: here.

Scope: AI (all varieties), no restriction on the domain of application.

Intended Audience: A very broad audience: those engaged in the design and development of AI-enabled technologies (researchers, designore, vendors), those engaged in the governance of those technoltogies (policymakers, regulators, advocacy groups), and those affected by the use of those technologies (active and passive users in specific domains, the general public).

Summary: OSTP 2022, a publication of the White House Office of Science and Technology Policy, establishes a high-level framework that is intended to guide the development of policies and practices seeking to advance the responsible development and use of AI. It does so through the identification of five basic principles adherence to which is fundamental to the responsible use of AI and so should serve as touchstones for the development of policy. The document supplements the principles with guidance as to how they may be realized in practice. In summary form the five principles are:

- **Safe and Effective Systems.** *You should be protected from unsafe or ineffective systems.*
- **Algorithmic Discrimination Protections.** *You should not face discrimination by algorithms and systems should be used and designed in an equitable way.*

[16] The October 2022 Blueprint was followed, in October of 2023, with an Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence. Among the provisions of the EO relevant to this toolkit are (1) the directive that NIST create guidance and benchmarks for evaluating and auditing AI capabilities, and (2) the directive that relevant government agencies adopt the NIST AI Risk Management Framework (see NIST 2023 above) as a tool in assessing the safety and security of their AI-enabled processes.

- **Data Privacy.** *You should be protected from abusive data practices via built-in protections and you should have agency over how data about you is used.*
- **Notice and Explanation.** *You should know that an automated system is being used and understand how and why it contributes to outcomes that impact you.*
- **Human Alternatives, Consideration, and Fallback.** *You should be able to opt out, where appropriate, and have access to a person who can quickly consider and remedy problems you encounter.*

Key Contributions: Features of OSTP 2022 that stakeholders in the development of AI policy may find particularly helpful include the following:

- **Attention to the challenge of operationalization.** For each of the five principles, OSTP provides guidance as to how the principle may be operationalized. Included in the guidance for each principle is a set of real-world examples (under the heading *How these principles can move into practice*) that illustrate ways in which the principle in question has been, or could be, operationalized. Though falling short of a method for operationalization, the examples will serve as helpful prompts for policymakers and other stakeholders seeking ways to capture the intent of a principle in an effective policy directive.
- **Recognition of the importance of effectiveness.** The first principle *(Safe and effective systems)* recognizes the importance of establishing the *effectiveness* of AI-enabled systems as a component of managing the risks associated with those systems...

- The need to establish, by sound evaluations, the effectiveness of systems is often overlooked and the challenge of doing so is non-trivial. OSTP's highlighting of questions of effectiveness is a helpful reminder to stakeholders seeking to lay the foundations for meaningful policy around AI.
- **Weight of the White House.** Apart from any other considerations, simply the fact the principles identified in OSTP 2022 (and their supporting guidance) are advocated by the White House gives them weight.

PAI 2016: Partnership on AI – PAI Tenets

- **URL:** here.
- **Scope:** AI (all varieties), no restriction on the domain of application.
- **Intended Audience:** All stakeholders in the trustworthy design and use of AI (researchers, designers, developers, operators, policymakers, industry associations, community organizations, advocacy groups, the general public).
- **Summary:** PAI 2016, one of the earliest sets of guidelines for the responsible design and use of AI, represents the consensus view of a broad range of groups engaged in the development of AI and in efforts to govern AI: academic institutions, civil society groups, private industry, media organizations. Grounded in thinking around six key AI-related themes (or Pillars),[17] PAI 2016 articulates eight guiding tenets to which PAI's members commit. Examples include:
- **Tenet 1:** We will seek to ensure that AI technologies benefit and empower as many people as possible.

[17] *E.g., Safety-Critical AI (Pillar 1) and AI, Labor, and the Economy (Pillar 3).*

Tenet 3: We are committed to open research and dialogue on the ethical, social, economic, and legal implications of AI.

Tenet 7: We believe that it is important for the operation of AI systems to be understandable and interpretable by people, for purposes of explaining the technology.

Key Contributions: Features of PAI 2016 that stakeholders in the development of AI policy may find particularly helpful include the following:

Consensus view. The PAI tenets, though very general, represent the consensus view of a diverse group of stakeholders and thus serve as a useful starting point in thinking about the requirements of an effective AI governance regime.

On-going work. PAI supports on-going work (workshops, papers, and other resources) that complements the tenets; these resources are available on the PAI website.

UK 2021: GOV.UK – National AI Strategy

URL: here.

Scope: AI (all varieties), no restriction on the domain of application.

Intended Audience: All stakeholders in the prosperity of the UK and the contribution that AI can make to that prosperity.

Summary: UK 2021, a publication of the UK's Secretary of State for Digital, Culture, Media and Sport, articulates a *National AI Strategy* for the UK. The goal of the strategy is generally to map out a plan for incorporating AI in the UK economy in a way that ensures the long-term robustness and strength of that economy...

The goal, more specifically, is to ensure (a) that the UK remains at the forefront of AI-related research and innovation, (b) that the UK effectively integrates AI in all sectors of the economy, and (c) that the UK enacts governance mechanisms that mitigate the risks associated with AI. While focused on the safe and effective integration of AI into the UK economy, UK 2021 also serves as a resource for insights and suggestions for stakeholders in the safe and effective integration of AI in an educational system.

Key Contributions: Features of UK 2021 that stakeholders in the development of AI policy may find particularly helpful include the following:

AI Bootcamp. UK 2021 recognizes the need to broaden the distribution of AI-related competency across all segments of society. In answer to that need, the document advocates for using the Department for Education's *Skills Bootcamps* to provide an accessible pathway to AI-related skills and training. Stakeholders in the integration of AI in schools may find the "bootcamp" model a useful component of an AI-focused professional development plan.

AI Standards Hub. Recognizing the need for coordination among AI-related standards-setting initiatives, both within the UK and internationally, lest the multiplicity of standards becomes a drag on innovation and industrial development, UK 2021 proposes the piloting of an *AI Standards Hub* the goal of which would be to coordinate standards-setting initiatives. Stakeholders in the integration of AI in schools, especially those at the state level, may wish to consider a "hub" along these lines to coordinate AI-focused normative efforts (standards and policies), both within state and nationally.

PART 7

SUMMARY OF RESOURCES

In *Part 7*, we conclude the toolkit with a brief summary of the resources discussed in *Parts 2* through *6* of the toolkit. Table 1 summarizes the areas of focus (in terms of the five functional policy-development steps (see **Part 1** and **Part 3**) and in terms of the perspectives of teachers ("T"; see **Part 4**) and parents ("P"; see **Part 5**) of each of the guidelines discussed in this toolkit. A dark blue box (●) indicates focused coverage of a step; medium blue (●) indicates some coverage; light blue (●) indicates light coverage. For convenience, a hyperlink connects each guideline included in the table to the corresponding discussion of the guideline in **Part 6** of the *Toolkit*.

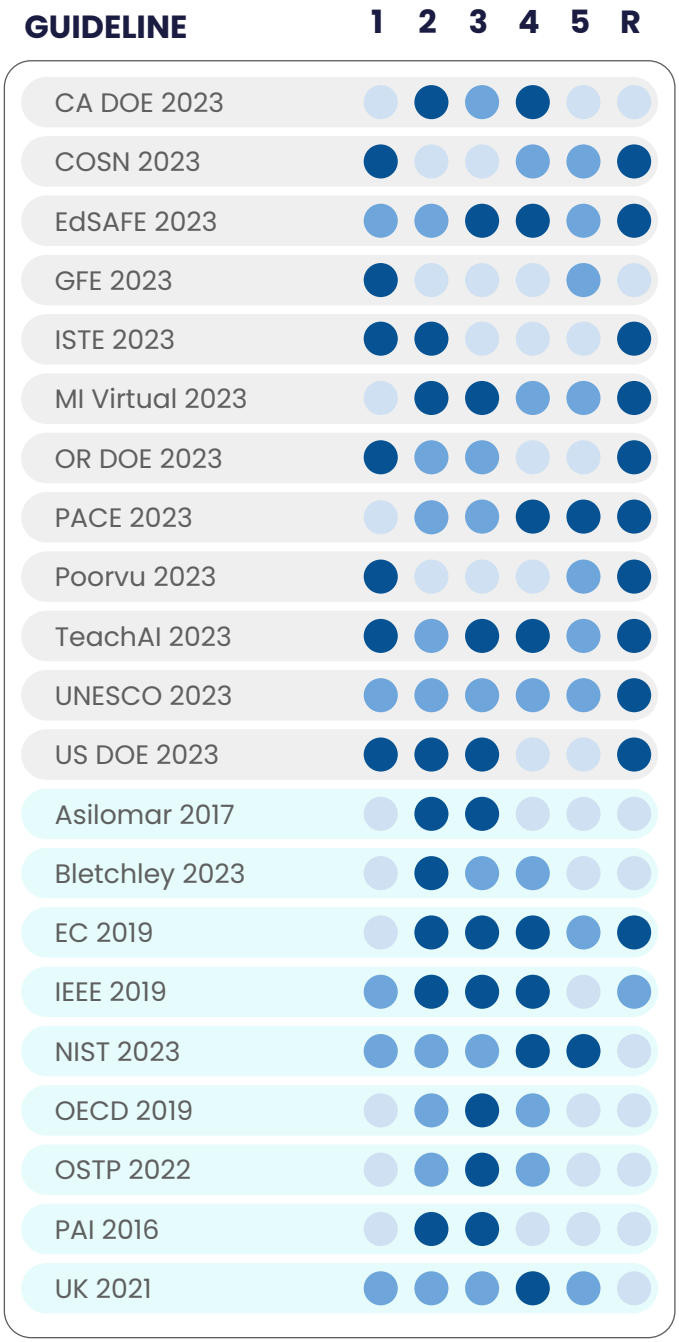

Table 1: Summary of areas of focus for guidelines