Teachers Who Design for Possibility:
A Practitioner Brief on Education Technology for Empowerment
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Rationale and Overview

Learning in the 21st century requires educators to freely leverage education technology to open up possibilities that elevate and empower students to innovate and participate in emerging fields and their accompanying benefits. This is relevant for students at Orange High School, where faculty and staff are committed to transforming students into responsible citizens who are empowered to participate in and steward technology and its role in the community.

We offer a practice guide for teaching toward possibility. In this brief, we summarize learning perspectives as a framework and provide practical examples using these approaches immediately. We hope readers will use this brief to inform, affirm, or expand their insights about what it might mean to design for possibility in the 21st century.

Guiding Framework

This framework is based on the premise that learners win if taught in personally meaningful, authentic, and empowering ways. To understand this proposition, we draw on learning theories on culturally responsive pedagogies (Ladson-Billings, 1995; Paris, 2012; Emdin, 2016; Gay, 2018), situated cognition (Brown, Duguid, Collins, 1989), and critical inquiry/active learning (Prince and Felder, 2006; Freire, 2020). This approach situates learners as empowered agents who generate ideas inextricably linked to culture and community. These ideas are summarized in the following guiding principles:
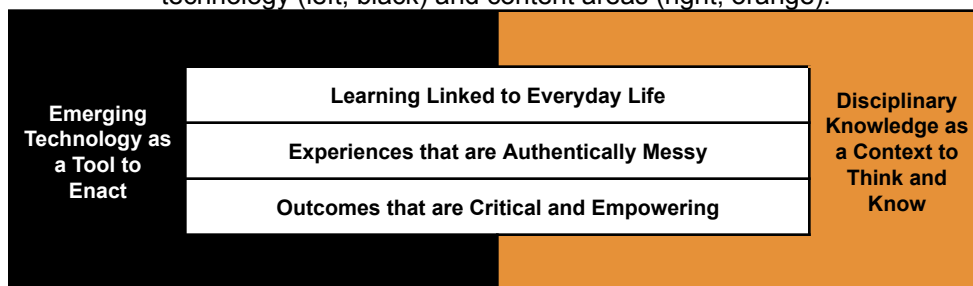
Learning that is inextricable to learners and their everyday life. We treat learning as linked to the environment. This idea suggests that learners benefit when learning designs are tied to their personal interests, cultural histories, and sociopolitical concerns. This can be understood as activities that draw on what learners are most familiar with as a starting point for constructing new ideas (e.g., learning activities that use artificial intelligence (AI) to explore topics about their hobbies or community culture). Consider how AI can be used to relate a topic to students and their daily lives.

Learning practices are authentically messy and meaningful. Students should have ample chances to construct ideas in spaces that offer explicit and implicit learning. Situating these acts in authentic practice means having immediate application utility (e.g., using subject matter content to accomplish something rather than master an idea that might never be used beyond a school environment). Consider: What areas in this subject do you anticipate students will have the most difficulty with? How can AI serve as a tool to help students scaffold their learning?

Critical open inquiry is the driver of learning. This is when learners gain skills that empower and embolden them to enact change in their community. In this frame, learning is meant to equip students with the insights and skills to critically assess and help shape their immediate community (e.g., students frame inquiry questions to investigate concerns they have about issues that impact their neighborhood). Consider: What questions do you anticipate students may come away with? What questions allow students to reflect on how these topics relate to themselves and their communities? How can students use Socratic questioning to design questions that allow for more open and robust discussion with AI?

These principles, summarized in Figure 1, represent the underlying "why" and "how" we use learning technologies and content knowledge to shape instruction.

Figure 1. How we conceptualize learning principles (middle, white) and how they relate to learning technology (left, black) and content areas (right, orange).

Emerging Technology as a Tool to Enact	Learning Linked to Everyday Life	Disciplinary Knowledge as a Context to Think and Know
	Experiences that are Authentically Messy	
	Outcomes that are Critical and Empowering	

In this section, you will find a roadmap delineating a suggested approach to integrating AI in a high school English 3 class. This roadmap begins with a vignette that speaks to the struggles many teachers may face as they search for ways to access and leverage technology that may feel unknown and unregulated, but is increasingly becoming part of daily life.

Once you become acquainted with the backdrop of this scenario, you will find a suggested lesson action plan to responsibly bridge English Language Arts (ELA) and AI. We then describe activity alignments with social studies/history and science, technology, engineering and math (STEM) that could culminate in a collaborative project across disciplines and classrooms. This trajectory is meant to illustrate how technology like AI can be used within disciplines and create entry points to other subject areas in ways that stand alone or support efforts in ELA.

ELA Example
Subject: Declaration of Independence (DOI)
Goal: Students can understand how the Declaration of Independence is relevant to the characters in "A Raisin in the Sun"

Imagine that you're an 11th-grade ELA teacher who needs to get your students to understand how the choices and actions of the characters in "A Raisin In the Sun" affect their ability to obtain "life, liberty, and the pursuit of happiness." You have a moderate window of time to get your students to understand the significance of the DOI and a moderate amount of time to get them to compose an essay analyzing how at least one of the characters has lived up to the DOI's concept of a fulfilled life. You anticipate that without proper scaffolding in the writing process, students may turn to AI to generate a response to the above prompt. As a teacher, you feel that using AI borders on plagiarism and a lack of academic integrity. However, you also understand that the pervasive use of AI has leaked into many facets of life. You are looking for ways to be more accepting of this new technology while still helping students build the skills they need to be academically competitive and civically minded.

Suggested Plan:
1. Give students the following prompt: With a partner, rewrite the preamble from the DOI in today's language.
2. Then, have students rewrite the first part of the DOI using AI in modern language.
3. Ask students:
   a. What parts of the DOI do they most relate to or are the most important to them?
   b. Who in present-day society is denied life, liberty, or the ability to pursue happiness?
4. Have students ask AI: Who in present-day society is denied life, liberty, or the ability to pursue happiness? Have students compare their written responses to AI. Ask them what might be missing from the responses. What nuances exist in the responses? Ask them how or why potential disparities/contradictions might exist between their viewpoints or experiences and those represented in AI versions.
5. Consider asking students what they would ask the writers of the DOI if they were alive.

6. Have students work with a partner to research the views of one of the writers of the DOI. Then, have them try to respond independently to the questions that were previously developed.
7. Next, use an AI bot to help answer the questions the partners developed. Have students review and compare their written responses. Ensure students understand that their versions can be considered better or just as good as the AI version.
8. Finally, the teacher can create an AI bot that is either the author of "A Raisin in the Sun" or a character from "A Raisin in the Sun." Set a parameter so that the AI bot asks students Socrative questions that will help them find evidence for the following writing prompt: Which character in "A Raisin in the Sun" best embodies the concepts described in the DOI preamble, and which might not be represented or considered in the DOI?

Figure 2. Teachers use AI as a tool across subject areas to teach students to inquire critically (left), explore ideas that are personally meaningful (middle), and collaborate in authentic practice (right).
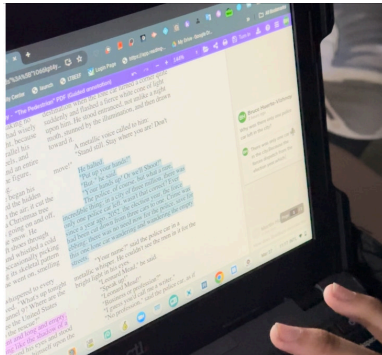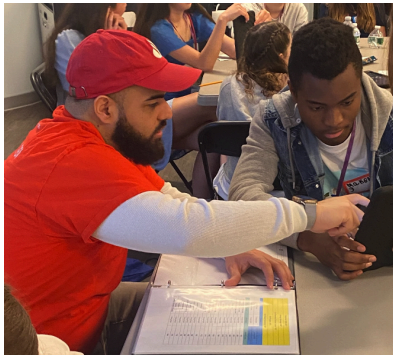
History Alignment (Build a Bot): While there may already be AI bots that focus on the DOI/Bill of Rights (BOR), have students build an AI bot that can respond to questions from the ELA/history unit. Students of English 3 should partner with students from U.S. History 1. Find relevant and reliable resources for their bot that speak to the creation and process behind the DOI/BOR. Consider asking students to find counternarrative texts as well to evaluate for bias. Co-develop at least 5 Socratic questions that you want the bot to respond to or ask. Students will also need to be specific about the bot parameters. Should the bot be able to ask Socratic questions? Should the bot be sure to ask for clarity or ask if it can clarify ideas?

STEM Alignment (Data Mining): History and/or ELA can work with a computer science class to mine data (Walker et al., 2023) on social media sites that show common misconceptions about DOI/BOR. Students can also collect and analyze numeric data using advanced statistics and other math to substantiate their ideas. Following this activity, they could create a short infographic addressing these misconceptions. This could also be a good exercise to leverage with AI, wherein students compare the results they constructed with those generated through AI. This would lend itself to classroom discussions about AI accuracy and subjectivity. It would also be conducive to discussions about who designs or informs AI and how this might shape, skew, or altogether misrepresent the truth, including which narratives are represented and which are not.

Implementation Principles:
Linked to everyday life: DOI/BOR are fundamental to students' lives; getting them to understand how these documents affect them and others is integral. AI can help students better understand DOI/BOR by crafting a modern version. Students can ask questions such as: Who was the audience for the DOI/BOR? Who was not considered when writing the DOI/BOR?

Authentically messy: Students may struggle to connect to the language of the seminal documents, have difficulty developing Socratic questions, or want to regress to "input/output" with AI. The key is to get students to understand that the process is more meaningful to their learning than the product.

Driven by critical inquiry: Students must generate Socratic questions embodying interpretive and universal question types. The questions around the DOI should allow students to reflect on how it affects their community and how they can change it. Students should be able to think critically about who can pursue life, liberty, and happiness within society. How accessible are these concepts to society's most marginalized demographics?

Many teachers are apprehensive about using AI in the classroom. They are concerned about navigating classes where students may not have had much experience engaging with text analysis and critical thinking, which involves problematizing what we think and know about a subject, technology, or phenomenon. Getting students to understand the process of critical thinking and analysis may empower them to use AI more critically, responsibly, and intentionally to render a nuanced and meaningful product.

- Find AI that allows for Socratic questioning instead of input/output.
- Be specific and direct about the product and goal.
- Understand your priorities: Is it about the process or the product? You might not be able to have both in the initial stages of introducing AI.
- Understand that AI is not perfect. Bias and misinformation do exist, sometimes by accident and other times by design.
- Stress that it is supposed to help you think and not replace you in the learning process.

Implications for Possibility

Culturally responsive pedagogies, situated cognition, and inquiry-driven learning are powerful perspectives that are readily actionable in everyday teaching practice. The examples we present, which thread across ELA, history, computer science, and mathematics, illustrate this. We hope this practitioner brief serves as a starting point to affirm or expand your perspectives about learning for the 21st century and how technology might be used productively to support, not undermine, learner outcomes.

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