

Chapter 8

Play to Learn: AI-enabled Gameful Instruction for Multilingual Learners – Dawn M. Hathaway,
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Gameful Instructional Strategies and Tools

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Tips to Get Started

Become familiar with COPPA

The Children's Online Privacy Protection Act (COPPA) (1998) is the US law that protects the privacy of children under 13 when they use websites, apps, and online services that collect data from users. This protection extends beyond US borders, applying to any child accessing American-based platforms. [Common Sense Media](#) is a good source for additional information and resources on COPPA.

Align games to learning goals and standards

Whether using a teacher-created, student-created or commercial game, gameful instruction is intentionally designed. Before selecting a game, identify learning goals and standards and the ways the game aligns with them. Does the game reinforce a specific concept or skill? Will the game serve as an introduction, skill building, review, application, or assessment tool? How does the game play connect to learning standards and curricular goals?

Assess learning

While students may be excited and engaged to play a game, it is important to measure what they are actually learning. Consider formative assessments that might consist of simply observing students as they play, asking questions, and checking for understanding. Performance-based assessments make visible what students learn when game concepts are applied to real world scenarios or problems.

Play the Game

The best way to understand how a game connects to learning goals is to explore and play the game. Stepping into the shoes of students allows the teacher to understand what it feels like to play the game, what kinds of thinking are practiced, and if the game support content learning.

Start small and simple

Although this chapter presents examples of AI-enabled digital platforms, gameful instruction does not necessarily have to use high-tech tools. Traditional board games or low-tech options reduce barriers like technology access and learning curves for both teachers and students. Simple competitive or cooperative activities like trivia games and scavenger hunts can reinforce learning. Card and board games, or even a [custom classroom-made board game](#), can be effective skill building tools.

Collaborate with Colleagues

Co-designing with colleagues capitalizes on diverse perspectives and shared expertise. Additionally, teachers can share subscription costs, licenses, or physical resources to ensure equitable access to students. Collaboration with other teachers honors the social nature of gameful instruction.

Invite Students as Game Co-Designers

Students bring creativity and ownership when they are involved in designing the learning experience. Situating them as game designers promotes authentic activity, critical thinking, and structured interactions that lead to social negotiation of meaning and focused communications.

Students can be tasked to modify existing games to align with learning objectives or encouraged to design their own educational games (e.g., creating a board game about ancient civilizations).

Debrief

After gameplay, use exit tickets and reflection strategies to engage students in summarizing key takeaways related to content learning, but also their experience with the game. What worked? What did not work? What were their successes? How did they overcome challenges.

Terminology

Digital Game-based Learning. Simulations. Escape Rooms. Serious Games. Gamification. Game-based Learning. The terminology pertaining to games can be overwhelming! Chapter 10 uses the term *gameful instruction* as an overarching concept that encompasses all these different terms. Each game type has different features and applications. We have presented definitions here for those terms not defined in Chapter 10. Knowing the features of these game types can help you choose the type of game that best aligns with your learning goals.

Artificial Intelligence: Artificial intelligence is an overarching, general term that refers to computer systems which perform tasks that typically require human intelligence (e.g., speech recognition, natural language processing (NLP), text generation and translation, video, sound, image generation, and decision making). A glossary of terms specifically created for teachers can be found at these websites:

[Glossary of Artificial Intelligence Terms for Educators – CIRCLS.](#)

[50+ AI Terms Every Teacher Must Know: A Complete A-Z Guide | Edcafe AI](#)

Digital Game-Based Learning (DGBL): Digital Game-Based Learning is the term used to “characterize the relationship of computer-based games (including games played on dedicated gaming consoles and mobile devices) to various learning processes or outcomes” (Aguilera & deRoock, 2022)

Game-based learning: Game Based Learning (GBL) involves using games to facilitate learning, encouraging students to engage in the educational process while having fun and making learning more interesting with relevant practice, specific timely story, game goals or challenges (Al-Azawi, 2016; Shahrokni, 2024).

Gamification: Gamification involves integrating game design elements, such as progressing to different levels, scores, avatars, virtual currencies, or competition with friends, into non-game contexts, including educational situations to enhance student active learning, motivation, and engagement (Al-Azawi, 2016; Huang et al., 2020; Shahrokni, 2024). They reward users for certain behaviors

Serious Games: Serious games are “interactive digital applications that go beyond entertainment and incorporate educational, informational, or training objectives as the goal of the game” (Lamb, 2024, n.p.).

Educational Game Categories

Arcade Games: Arcade games are games of skill played on coin/token operated game machines found in public businesses or computers in which game software has been installed, downloaded, or accessed via an online website. Moura (2015) proposed that the features of arcade games such as , have the potential to support learning

Skills Software: Skills software is designed to provide learners with opportunities to practice a skill they are developing with repeated examples that require the desired skills. Representative examples of this kind of software include programs that teach sight words, vocabulary, multiplication facts, spelling words, recall of historical figures or geography facts related to any discipline. It is important to remember that skills software does **not** teach a skill. Rather, software in this category provides opportunities to practice an emerging skill after the skill has been presented, and learners have completed examples with the support of a teacher, peer, or parent.

Problem-Solving Software: Problem-solving software can be divided into two subcategories. The first category consists of problem-solving software that identifies a particular problem or set of problem-solving strategies (i.e. memory, induction, deduction, hypothesizing, matching) and presents repeated examples of problems, allowing students to experiment with and master particular problem-solving strategies. An example of this category includes [Lemmings](#) that teaches deductive reasoning and sequencing. A second category of problem-solving software presents users with a global problem often requiring a variety of problem-solving strategies – to get through a maze, to collect a set of map pieces or gold coins, or to rescue a character. Problem-solving programs, regardless of category, generally but not always have correct or straightforward solutions.

Interactive Fiction software: Interactive fiction software simulates environments in which players use text commands to control characters and influence the environment through an adventure or role play. The interface is text only or text accompanied by graphics with the interactions accomplished by typing text. Through an exchange of player input in the form of short commands or sentences, game output is text revealing movement through a story. [Bedtime](#) is an example of an Interactive Fiction game. There are no advertisements or sign in requirements.

Simulation Software: Simulation software is software that recreates a “real” or “like real” situation. The focus of the user is on recognizing the variables that define the situation and the rules that guide the interactions of those variables. Generally, in a simulation, there is no “right” answer. Instead, some choices lead to more or less desirable results. The purpose of an educational simulation is to help students understand the criteria for decision-making in particular situations, to allow students to experiment with controlling variables and predicting outcomes, and/or to become familiar with situations that they are unable to actually experience. [Coffee Stand](#) engages students with economic principles, supply and demand, and marketing forces.

Digital Tools to Support Gameful Instruction

Adaptive Learning Platforms

Adaptive Learning is the use of data-driven insights, AI, and algorithms to adjust content and difficulty according to an individual's learning needs and pace (Taylor et al., 2021). Adaptive learning platforms provide personalized learning at scale by assessing learners' current skills/knowledge, providing feedback and content, and then constantly monitoring progress by utilizing learning algorithms that provide real-time updates and the necessary tools to improve student learning (Educause Learning Initiative, 2017).

Duolingo is an example of an adaptive learning platform that uses data-driven insights, AI, and algorithms “to adjust lesson content and difficulty to individualized learning style and pace. This personalized approach aims to make language acquisition feel tailored yet game-like at the same time” (Caldwell, 2024, n.p.). In [Duolingo's Adventures](#), learners take on roles with the opportunity to interact with characters who provide immersive feedback in real-life storylines.

AI-based Interactive Learning

AI technologies provide an interactive, engaging, personalized educational experience to explore diverse history, art, and culture through immersive learning. Using AI for personalization, exploration, and feedback, transforms learning about art and culture into a dynamic, game-like adventure that keeps users motivated and continuously learning. For example, [Google Arts & Culture](#) offers several AI-based games and interactive experiences. These features allow users to guess where artwork given in images came from in the world map, transform their photos into art, and draw objects for AI to guess. These tools foster creativity and learning by blending technology with joyful interactions and art. For multilingual learners, these AI-powered activities can be useful in enhancing cultural understanding and language practice while exploring artwork. Students can engage with art from different languages and cultures, using visual and contextual clues to support language development. Interactive tools such as AI-enabled [Guess the Lines](#), can encourage students to practice vocabulary and describe objects in the language. These experiences provide a fun, immersive way to practice language in a context that is meaningful and visually engaging.

Digital Educational Escape Room (DEER)

Escape rooms (ERs) were initially created for recreational purposes (Maroto Sánchez, 2023). Educational escape rooms (EERs) are engaging, problem-based activities that are time-constrained and require active collaboration among participants. With the rise of digital teaching environments, a new concept has emerged: digital educational escape rooms (DEER) (Makri et al., 2021).

DEER, which incorporates game-based learning, includes key elements such as goal setting, clear starting points, tracking progress, rewards, and instant feedback, all of which keep students engaged and motivated. In a DEER, participants must solve a series of puzzles to advance through the challenge and ultimately "escape" or achieve a specific goal within a designated time limit. Emotions play a significant role in memory and learning. DEER can evoke feelings such as excitement, frustration, accomplishment, and curiosity, which help establish stronger emotional connections to the learning process. DEER encourages players to think critically, solve

problems, and adapt their strategies to overcome changing challenges, thus promoting cognitive flexibility.

Furthermore, DEER provides multisensory experiences that introduce diverse inputs in a fun, immersive, and interactive environment. There are numerous digital escape room platforms and game-based learning tools such as [Genially](#), that are ideal for integrating language learning into an enjoyable and interactive experience.

Additional Digital tools

[Adobe Express](#) is a cloud-based design tool that incorporates AI, enabling the creation of various images based on prompts. As presented in Chapter 10, this is the tool that Mr. Callahan allowed students to create images for each scene if they could not find a good image for each story scene in the slides. Note: An account is needed to use this teacher tool.

[Diffit](#) is an AI tool teachers use to get “just right” instructional materials and helps all students to access grade level content. As presented in Chapter 10 this is the tool that Mr. Callahan used to create materials for the Hero Animal project. An account is needed to use this teacher tool.

[Easy-Peasy.AI: All-In-One AI Platform](#) is an AI content tool that supports a variety of writing tasks (e.g., blog posts, resumes, job descriptions, emails, social media content, and content for games). This is the tool that Mr. Callahan used to create his [Jeopardy game](#) using the Easy-Peasy.AI platform.

[How to make a Game in PowerPoint! \[Tutorial\]](#) shares how to make a simple labyrinth-style game in Microsoft PowerPoint. This is a YouTube video tutorial so teachers can rewatch and pause while they are creating their game in Microsoft PowerPoint.

[Factile Jeopardy Games](#) support teachers’ creation of content Jeopardy games. A sign-up for a free account allows a teacher to create 3 games. Teachers are able to display or project the game for a whole-class competition.

[Kahoot! | Unlock the power of AI](#) in your classroom requires a Kahoot+ Gold or Kahoot!EDU plan for AI-enable Kahoot! [Kahoot](#) has free options for teacher or student generated questions.

[Magic School AI](#) is a web-based platform offering 70+ AI-powered tools for educators and 40+ for students, designed to save time, personalize learning, and enhance classroom engagement while ensuring privacy and safety compliance. Teachers can create an account or use a Google account for free access.

[PhET offers free online physics, chemistry, biology, earth science and math simulations](#). Some features on this site require an account. There are no advertisements on this site.

[Student-Made Board Games Ideas for Elementary Teachers in 2025 - Teaching with Jodi Durgin and Company](#)

[Rosebud AI](#) provides a tool for teachers to create games. The website provides access to established teacher-created games. Although the site indicates the ability to try it for free with a Google account or by providing an email address. The privacy policy for this platform indicates that personal information may be stored.

Aligning Games with Disciplinary Content

[Minecraft: Education Edition](#) supports STEM learning. It requires a download and has a free trial.

[Settlers of Catan](#), a physical board game that promotes practice of resource management.

[iCivics in Education](#) is specifically designed for teachers to implement in classrooms with alignments to state social studies standards. There is a free sign up/registration for teachers, administrators, students and/or parents. There are no advertisements.

[Pandemic](#) encourages cooperative play and strategic thinking.

Simulations such as [Diplomat](#) or [Oregon Trail](#) promote decision making, effective communication and critical thinking through engagement in historical reenactments or global issues. Oregon Trail may be played online . Game progress can be saved onto a computer to continue play at a later date. Advanced versions of the game are available.

An AI-enabled Gameful Summative Assessment Example: Hero Animal Project

Teachers can design a summative assessment as a creative, gameful storytelling project in which students demonstrate contextual knowledge, creativity, and critical thinking through the invention of a character or figure. For example, in Mr. Callahan's classroom, students created storylines about superhero animals tasked with rescuing oppressed people during historical moments such as the Holocaust or the Jim Crow era. As part of the project, students were encouraged to enhance their stories by adding images, audio recordings, and other multimedia elements to deepen engagement and bring their characters to life.

AI tools, such as Bing's translation features or Diffit's text-leveling options, help ensure that multilingual learners have equitable access to the content and can express complex ideas effectively. Teachers can assess students on how well they organize their project, the clarity and coherence of their narrative, the accuracy of historical connections, and the creative use of multimedia elements to support storytelling.

To support students throughout the process, Mr. Callahan implemented the project through a series of scaffolded steps, from early outlining to drafting to final presentation. Chunking the work in this way allowed for ongoing feedback and made the task more manageable, particularly for multilingual learners who must balance language development with new content learning. In addition, this type of creative storytelling project aligns with brain-based learning principles by encouraging collaboration, visual expression, and individualized learning pathways. Students can work together during planning sessions, incorporate visual and artistic elements into their narratives, and use AI and multimedia tools to refine their stories. By evaluating the quality of the final multimedia story elements (e.g., its organization, visuals, audio additions, and historical insight), teachers can assess both students' understanding of the content and their ability to synthesize and present complex ideas in an engaging, personalized format.

Summative Assessment SMART goal (AI-Enabled Gameful Hero Animal Project)

S = Specific **M** = Measurable **A** = Achievable **R** = Relevant **T** = Time-based

S: The goal is for students to create a digital story, demonstrating their understanding of the given context and/or historical events (e.g., the Holocaust or Jim Crow periods) by integrating a few historical facts. The story should include a clear narrative structure, visual elements, and character development.

M: By the end of the project, at least ____ (%) of students should meet the project criteria for clarity, creativity, and historical/contextual knowledge accuracy, as assessed through self-evaluations and teacher feedback.

A: Teachers help students go through multiple stages (outlining, drafting, revising) to develop their stories, and students will be supported with AI tools for image creation (e.g., Adobe Express) for language assistance and collaborative brainstorming.

R: This project aligns with historical and contextual understanding and creative expression, supporting the development of critical thinking, historical knowledge, and narrative skills—important for students' academic growth and language background.

T: The project will be completed by the end of the designated unit, with the final presentation and evaluations occurring within the set timeframe.

PAR/Design Research Data and Themes

In this section, we provide themes generated from our analysis of Mr. Callahan's implementation of the *Anne Frank Jeopardy* game (formative assessment). We have also included themes generated from our analysis of Mr. Callahan's implementation of the *Hero Animal Project* (summative assessment) and student samples from this project.

Anne Frank Jeopardy game

Theme 1. Competition as Motivation

The game's Jeopardy format introduced a competitive element that motivated students to participate actively. Students appreciated tracking points and totals, which made the activity feel more engaging than a traditional Q&A review. One student suggested team play (Blue, Red, Yellow, Green teams), showing how competition can evolve into collaborative play structures.

Theme 2. Multilingual Learner Strategies & Supports

Multilingual learners (MLL) used online translation tools (Google/Bing) to access the content more effectively. Time was intentionally given for this, showing how scaffolds can reduce affective filters and allow students to engage meaningfully. MLLs also supported one another using both home languages and English, which facilitated comprehension and participation.

Theme 3. Collaboration & Cross-Linguistic Teamwork

The *Jeopardy* game created space for peer support within shared language groups and then extended outward to collaboration with peers from other language backgrounds. This teamwork reflects authentic, socially mediated learning processes valued in multilingual education.

Theme 4. Engagement Beyond the Tool

Students valued that the game went "past just answering questions," incorporating web tools, verification steps, and score tracking. The layered structure of the game that supported searching for information on the topic, verifying search results, highlighting key points, and obtaining a total score created active learning moments rather than just passive recall. This shows how digital games can be designed to extend beyond the platform.

Theme 5. Accessible Entry to Complex Content

The *Jeopardy* game offered a non-graphic, accessible way for students to build background knowledge about the Holocaust, supporting their required reading of Anne Frank. The activity gave students a safe entry point to a challenging historical topic, balancing sensitivity with engagement.

Since Mr. Callahan's *Hero Animal Project* represented a teacher-created gameful experience, we decided to analyze this summative assessment through the principles of a well-designed game to showcase the ability of teachers to create well-designed gameful instruction. We found the following connections:

Motivation & Engagement

The superhero storyline introduces surprise, novelty, and emotional connection, motivating students to persist with the task.

Personalization & Adaptive Learning

AI tools help adapt texts to students' linguistic and cognitive levels, ensuring equitable access without diluting rigor.

Learning & Cognition

Students build on prior knowledge of history, scaffold their ideas through drafts, and transfer critical thinking into a narrative format with feedback at each stage.

Identity & Agency

Students design unique superhero animals with powers and backstories, exercising agency and embedding their personal and cultural perspectives in the project.

Social & Collaborative Learning

Class discussions, peer feedback, and collaborative brainstorming provide opportunities for students to learn from and support one another.

Embodied & Experiential Learning

Storytelling, illustrations, or even dramatic presentations of their superhero figures allow students to embody their creations and engage multiple modalities.

Here are some student samples from *Hero Animal Project*:

[Student Work Samples](#)

Although many aspects of the experience exhibited alignment to supporting strategies of game design principles, we noted that this project could be extended so that the initial experience could serve as a plan for a Choose Your Own Adventure type game, either as a project to be designed by teachers or students. Specifics on the steps for creating a Choose Your Own Adventure game as well as student samples of the original project can be found in the following sections.

Let's Play: Hero Animal Project

A Challenge to Readers

Mr. Callahan's Hero Animal summative assessment project, used AI-enabled tools for image creation. In addition, he capitalized on students' interest in animals and characters from their favorite digital games to create a hero who has the character of the Heroes in the Holocaust and Jim Crow era historical texts they had read as part of class assignments. Students wrote about what it takes to stand up against injustice by describing their animal's dispositions and situating their animal in a story. Creating a character and a story are the preliminary features of a gaming environment. Here are more resources from Mr. Callahan's Hero Animal project which engaged sixth grade Language Arts students in thinking deeply about the dispositions and actions of those who stand up to injustices.

[Heroes In Action: Standing Up To Protect Others](#)

We invite you to step into the shoes of Mr. Callahan to develop your game design skills and that of your students. How might Mr. Callahan advance his project design? How might you extend this project to include students as co-designers of a game? One way might be to have students develop a "Choose Your Own Adventure" game using Microsoft PowerPoint.

[CYOA Teacher Guide GoogleSlides.docx](#)

[Choose Your Adventure GoogleSlides Template](#)

[CYOA Student Planning Worksheet.docx](#)

You might consider asking genAI tools (e.g., OpenAI's ChatGPT, Google's Gemini, Microsoft's Copilot) for ideas, treating them as collaborators and co-thinkers. Here is a prompt you can use when reaching out to genAI tools:

I created a project where students design their own animal heroes and write stories that highlight social justice themes. After completing the stories, I want to create a gameful follow-up lesson to deepen their understanding and engagement with the concepts they've explored.

From the prompt above, you can gather a variety of ideas. Here's an example of a lesson and activities you can implement with your students:

Social Justice Puzzle Challenge

Activity: "Your animal hero faces a complex social justice issue that needs to be solved. Create a puzzle or riddle related to the issue, and have your hero work with allies to solve it. For example, if the hero is addressing access to education, the puzzle could be a series of steps to get everyone in the community the resources they need."

Game Element: Students could break the puzzle into parts, with each part requiring critical thinking, research, or group collaboration to solve. The solution might involve solving a riddle, making decisions about resource allocation, or creating plans to help marginalized groups.

Goal: Encourage problem-solving and critical thinking while reinforcing the importance of creative, collaborative approaches to solving social justice challenges.

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