



Game-Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Art Battle Game

Application details

C. Project Information

C.1. Project Title	Game-Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Art Battle Game
C.2. Project Duration	Two-year project
C.3. Select one or more UCalgary Teaching & Learning Grant <u>area(s) of focus</u> that apply:	✓ Course development and innovation ✓ Experiential learning, work-integrated learning, and undergraduate research ✓ Open Educational Resource (OER)
C.4. Have you reviewed the <u>Ethics in the Scholarship of Teaching & Learning Guide</u> in preparing your application?	Yes
C.5. Abstract - Please note that this content will be public if successful.	

This project develops open educational resources (OER) for teaching generative AI literacy through Muse Battle, a web-based game where AI agents or "muses" inspired by historical figures compete to create artwork judged by other AI agents. Players AI behavior from a critical distance: selecting which muse to deploy, then watching as their chosen agent generates art, crafts persuasive pitches, and defends its creation. The game makes AI transparent: all prompts are visible, allowing learners to trace connections between prompt design and AI output.

The project will produce lesson plans, classroom exercises, reflection prompts, and an educator guide that enable instructors across disciplines to integrate the game into their teaching. These materials will be licensed CC BY and shared through UCalgary's Open Education Alberta (Pressbooks) platform and the game's website.

Grounded in experiential learning theory (Kolb, 1984) and research on game-based learning effectiveness (Wouters et al., 2013; Clark et al., 2016), this approach addresses a critical gap: while AI tools proliferate, students lack deep understanding of how these systems work and fail (Ng et al., 2021). Research shows students hold significant misconceptions about generative AI (Mertala & Fagerlund, 2024), and anxiety-laden contexts around academic integrity interfere with learning. Game-based approaches create low-stakes environments that increase engagement and improve learning outcomes compared to conventional instruction.

The project will pilot materials in ENTI 333/633 (Generative AI and Prompting) and ENTI 674, then refine based on student feedback. Deliverables include a complete OER curriculum package ready for adoption by other instructors.

D. Project Description

D.1. Describe how your project is grounded in the University of Calgary teaching and learning context. To establish how your proposed project is relevant to student learning at the University of Calgary, explain how it emerges from your local experiences in teaching and learning in an academic course or program. (3 points).

This project emerges directly from my experience teaching ENTI 333 and ENTI 633 (Generative AI and Prompting), courses open to students from all disciplines at the undergraduate and graduate levels. I also teach ENTI 674, a course for Master of Management students that includes substantial AI literacy content. Across these courses, I have observed a consistent pattern: students arrive with significant misconceptions about how generative AI actually works.

Research confirms this observation is widespread. Surveys show most adults do not understand how large language models function, and worse, they hold active misconceptions about AI capabilities and limitations (Mertala & Fagerlund, 2024). In my courses, students often conflate generative AI with traditional AI, misunderstand the probabilistic nature of AI outputs, and fail to recognize phenomena like hallucinations and sycophancy when they are not completely obvious.

Compounding this challenge, classroom discussions of AI are frequently fraught with anxiety. Students worry about plagiarism accusations, job displacement, and academic integrity policies. This emotional context creates defensive learners rather than curious ones, making it difficult to foster the critical engagement that genuine AI literacy requires.

I developed Muse Battle (www.MuseBattle.com) as a prototype tool to address these challenges. It creates a playful, low-stakes environment where students can observe AI behavior without the pressures associated with using AI for their own academic work. This project will transform that prototype into a fully-supported educational resource with curriculum materials that any UCalgary instructor can adopt to incorporate AI literacy into their courses.

D.2. Describe how your project aligns with the area(s) of focus of the UCalgary strategic initiatives you indicated in the previous section. UCalgary is committed to supporting scholarship in these key areas of focus. How will your project strengthen one or more of these priorities? (3 points).

Course Development and Innovation: This project creates novel curriculum materials (lesson plans, exercises, and an educator guide) for teaching generative AI literacy through game-based learning. The materials address a timely pedagogical need: as AI tools become ubiquitous across disciplines, instructors need accessible ways to help students develop critical AI literacy. The OER package developed through this project will be immediately adoptable by instructors across faculties who want to incorporate AI literacy into their existing courses without developing materials from scratch.

Open Educational Resource (OER): All curriculum materials produced will be licensed CC BY and distributed through UCalgary's Open Education Alberta (Pressbooks) platform, following UCalgary Libraries and Cultural Resources' OER guidelines. Materials will also be available on the game's website. The game itself is free for educational use and instructors can charge games to their own credits rather than students if needed, but students receive enough free plays for meaningful learning experiences. This removes cost barriers that often limit access to educational technology tools.

Experiential Learning: The game embodies experiential learning principles. Students engage in concrete experience (playing the game, observing AI agents compete), reflective observation (analyzing why certain muses succeed with certain judges), abstract conceptualization (developing mental models of AI behavior patterns), and active experimentation (testing hypotheses in subsequent rounds). The curriculum materials structure this learning cycle explicitly, with reflection prompts and discussion guides that help students extract transferable insights about AI systems they will encounter in professional and academic contexts.

D.3. Identify the development or innovation in teaching and learning that you will pursue through your project, and the specific goals, opportunities, and/or challenges you hope to address. Demonstrate how existing pedagogical scholarship informs this work, and explain how your work is situated within the field. (3 points).

What is the novel approach you will develop through this work? How will you use this approach to improve student learning?

The Challenge: AI Tool Proliferation Without AI Literacy

Generative AI tools have become ubiquitous in higher education, yet students' understanding of these systems remains superficial. Research conceptualizing AI literacy identifies multiple competencies: understanding how AI works, critically evaluating AI outputs, recognizing AI limitations, and using AI ethically (Ng et al., 2021; Long & Magerko, 2020). Bozkurt (2024) argues that generative AI literacy is now essential for navigating educational and professional landscapes, yet current approaches often focus narrowly on tool operation rather than conceptual understanding.

This gap has concrete consequences. Students hold persistent misconceptions about AI: confusing language models with traditional machine learning, misunderstanding

the nature of training data and its impact, and failing to recognize hallucinations (Mertala & Fagerlund, 2024). When students do use AI tools, they often lack the critical stance needed to evaluate outputs effectively. Recent research warns that without appropriate scaffolding, students may use AI as a "crutch" that undermines rather than supports learning (Bastani et al., 2024).

Compounding these challenges, classroom discussions of AI often occur in anxiety-laden contexts. Students associate AI with concerns about academic integrity, plagiarism detection, and job displacement. This emotional framing creates defensive learners who approach AI warily rather than with the curiosity needed for deep understanding.

The Innovation: Game-Based Observational Learning for AI Literacy

This project develops curriculum materials around Muse Battle, a web-based game that teaches generative AI literacy through a novel pedagogical approach: observational learning of AI agent behavior in a competitive, playful context.

In Muse Battle (www.MuseBattle.com), AI agents called "muses" (inspired by historical and mythological figures) compete to create artwork that will impress an AI judge. Players exercise strategic judgment by selecting which muse to deploy against a revealed judge, then observe as their chosen agent autonomously generates art, crafts a persuasive pitch, and defends its creation. The game makes AI behavior transparent: all system prompts are visible, allowing learners to trace direct connections between prompt design and AI output.

This approach differs fundamentally from typical AI literacy instruction, which focuses on students using AI tools directly. By positioning students as observers rather than operators, the game creates analytical distance that reveals patterns and failures that direct tool use often obscures. Students experience the process of delegating tasks to AI agents, see how role prompting shapes AI "personality," watch AI hallucinations emerge in real-time, observe multi-agent dynamics as muses attempt to anticipate judge preferences, and witness the "LLM-as-judge" paradigm that increasingly shapes AI development.

Theoretical Foundations

The project draws on established learning theories that support this pedagogical approach.

Experiential Learning Theory: Kolb's (1984) experiential learning cycle provides the foundational framework. The game creates concrete experiences that students transform through reflective observation into abstract understanding that can be applied in new contexts. The curriculum materials explicitly structure this cycle with observation worksheets, reflection prompts, and transfer exercises.

Game-Based Learning Research: Meta-analyses consistently demonstrate that game-based learning improves cognitive outcomes compared to conventional instruction (Wouters et al., 2013; Clark et al., 2016). Serious games are particularly effective when supplemented with other instruction methods and when multiple sessions allow learners to develop familiarity with game mechanics (Wouters et al., 2013). Plass, Homer, and Kinzer (2015) identify key foundations of game-based learning: games engage learners cognitively, affectively, and behaviorally while providing immediate feedback that supports iterative learning.

Inquiry-Based Learning: The game's structure aligns with inquiry-based learning frameworks (Pedaste et al., 2015). Students observe phenomena (AI agent behavior), formulate questions (why did this muse succeed with this judge?), investigate through further gameplay, and construct explanations that build conceptual understanding of AI systems.

Improving Student Learning

The curriculum materials will translate the game's potential into structured learning experiences organized around specific learning outcomes:

1. **Understanding LLM Mechanisms:** Students will articulate how large language models generate text through next-token prediction based on prior context, appreciating the role of context engineering in the operation of AI agents.
2. **Recognizing Prompt Engineering Effects:** By observing how different muse prompts produce different behaviors, students develop practical understanding of how prompt design shapes AI outputs, which is a transferable skill for their own AI use.
3. **Identifying AI Failures:** The game naturally surfaces hallucinations, sycophantic responses, and inconsistencies. Curriculum materials guide students to recognize these patterns and develop appropriate skepticism toward AI outputs.
4. **Critical Evaluation Skills:** Students practice evaluating AI-generated content (the artwork and pitches) against criteria, building habits of critical assessment they can apply to AI outputs in academic and professional contexts.
5. **Understanding AI Training Dynamics:** The "LLM-as-judge" paradigm visible in the game reflects actual AI training approaches. Students gain insight into how AI systems are developed and evaluated.

The low-stakes game environment addresses the anxiety that often accompanies AI discussions in academic settings. By separating AI literacy learning from high-stakes academic work, students can engage curiously and experimentally. Fernández-Raga et al. (2023) emphasize that game-based learning helps students who struggle to concentrate in traditional formats, and that the novelty of game-based activities increases interest and information absorption.

Situating the Work

This project contributes to emerging scholarship on AI literacy pedagogy. While numerous frameworks define AI literacy competencies (Ng et al., 2021; Long & Magerko, 2020), fewer resources exist for instructors seeking practical approaches to develop these competencies in the generative AI era (post-2023). Game-based approaches to AI education remain rare, and observation-based approaches that position students as analysts rather than operators represent a novel contribution.

The OER materials produced will fill a practical gap: instructors across disciplines increasingly recognize the need to address generative AI literacy but lack curriculum resources. By creating openly licensed, ready-to-adopt materials, this project enables generative AI literacy integration across the university without requiring each instructor to develop materials independently.

D.4. Identify the activities you will undertake for your project and clearly describe how they align with, and contribute to, the project you identified above. Specify the innovation, interventions, or activities you will create or use. (3 points).

This project encompasses four interconnected activity streams across two years: game refinement, curriculum development, classroom piloting, and dissemination. Activities are designed to be iterative, with each pilot cycle informing subsequent refinement.

Year 1: Development and Initial Pilot (April 2026 – March 2027)

Game Refinement for Classroom Use (April – September 2026)

While the game prototype functions for individual use, classroom deployment requires enhanced stability, accessibility, and usability. Activities include:

- Systematic playtesting by undergraduate research assistants to identify bugs, usability issues, and points of confusion
- Accessibility audit addressing screen reader compatibility, color contrast, and mobile responsiveness
- Implementation of educator-friendly features such as shareable battle results for classroom discussion
- Documentation of technical requirements for classroom deployment

Student RAs will conduct structured playtesting using standardized protocols, documenting issues in a tracking system. This work develops students' skills in software testing, user experience evaluation, and technical documentation while ensuring the game is robust enough for classroom use.

Curriculum Material Development (July – December 2026)

The core project deliverable is a comprehensive OER curriculum package. Development activities include:

Lesson Plan Creation: Four complete lesson plans aligned with specific learning outcomes:

- Lesson 1: Introduction to LLMs Through Observation—students play initial rounds and document patterns in AI behavior
- Lesson 2: Role Prompting and AI Personas—students examine muse prompts and predict behavior differences
- Lesson 3: AI Hallucinations and Critical Evaluation—students identify and categorize AI failures observed during gameplay
- Lesson 4: Multi-Agent Dynamics—students analyze how muses attempt to anticipate judge preferences

Each lesson plan includes learning objectives, required materials, activity sequences, discussion questions, and assessment suggestions.

Student-Facing Materials: Observation worksheets that guide students to notice specific AI behaviors; reflection prompts that support the move from observation to conceptualization; vocabulary guides defining key terms (hallucination, sycophancy, role prompting, etc.).

Educator Guide: A comprehensive guide enabling instructors unfamiliar with the game to adopt it effectively, including technical setup instructions, facilitation tips, common student questions and responses, and suggestions for adapting materials to different disciplinary contexts.

Student RAs will contribute to material development, drafting initial versions of worksheets and discussion questions from a student perspective. This involvement

ensures materials are accessible and addresses actual student questions rather than assumed ones.

Initial Pilot in ENTI 333/633 (October 2026 – March 2027)

The initial pilot tests materials in their intended context:

- Integration of game and curriculum materials into ENTI 333 (undergraduate) and ENTI 633 (graduate) sections
- Documentation of implementation including time requirements, student engagement observations, and facilitation challenges
- Collection of student feedback through informal mechanisms: in-class discussion, written reflections, and voluntary feedback conversations
- Identification of materials requiring revision

This pilot is formative rather than evaluative—the goal is identifying what works and what needs improvement rather than measuring outcomes. Detailed implementation notes will inform Year 2 revisions.

Year 2: Iteration and Dissemination (April 2027 – March 2028)

Material Revision (April – August 2027)

Based on Year 1 pilot feedback:

- Revision of lesson plans addressing identified gaps, unclear instructions, or timing issues
- Refinement of student-facing materials based on observed points of confusion
- Enhancement of educator guide with implementation insights from pilot experience
- Additional game refinements addressing any issues surfaced during classroom use

Expanded Pilot (September – December 2027)

Revised materials are tested in expanded contexts:

- Implementation in ENTI 333/633 with refined materials
- Implementation in ENTI 674 (Master of Management), testing materials with professional graduate students
- If interest emerges from conference presentations, potential pilot by colleague instructors in other courses

This expanded pilot tests whether materials work across different student populations and, potentially, with instructors other than the developer.

OER Publication and Dissemination (October 2027 – March 2028)

Finalized materials are published and shared:

OER Publication:

- Materials formatted and published through Open Education Alberta (Pressbooks), following UCalgary Libraries and Cultural Resources guidelines
- Materials also posted on the game website for direct access
- All materials licensed CC BY, enabling adaptation and redistribution

Conference Presentations:

- Presentation at UCalgary's Taylor Institute Teaching and Learning Conference sharing the pedagogical approach and materials
- Presentation at the Administrative Sciences Association of Canada (ASAC) conference, reaching management education scholars
- Potential paper submission to Academy of Management Learning and Education if pilot results warrant

Local Sharing:

- Workshop or information session for interested UCalgary instructors
- Contribution to Taylor Institute resource collections
- Sharing through my existing invited talks and AI training workshops

Evidence Gathering

While this is a Development and Innovation project rather than SoTL research, systematic evidence will inform iterative improvement:

- **Student feedback:** Informal written reflections and discussion comments documenting what students found valuable, confusing, or missing
- **Implementation notes:** Instructor documentation of timing, engagement patterns, and facilitation challenges
- **Material usage tracking:** Which exercises were completed, which generated most discussion, which seemed to fall flat
- **Learning artifacts:** Student observation worksheets and reflection responses (with permission) illustrating how students engage with the materials

This evidence supports iterative improvement rather than formal research claims. However, the structured approach creates a foundation for potential future SoTL investigation of the game's impact on AI literacy outcomes.

D.5. Describe how you will engage students in your project, including their roles and activities and how you will recognize their contributions. Scholarship is strengthened by the inclusion of all relevant perspectives, particularly those of learners, at the centre of teaching and learning experiences. How will you include these perspectives in your project? (3 points).

Students are central to this project as both contributors and beneficiaries.

Paid Student Research Assistants

Five undergraduate students will be hired for approximately 50 hours each (\$5,000 total), contributing across three areas:

Playtesting and Quality Assurance: Students systematically test game functionality, documenting bugs, usability issues, and points of confusion. This develops skills in software testing, technical documentation, and user experience evaluation.

Curriculum Material Development: Students draft observation worksheets, reflection prompts, and discussion questions from a learner perspective. Their involvement ensures materials address actual student questions rather than assumed ones, and use accessible language.

Peer Feedback Gathering: Students conduct informal conversations with classmates about game experiences, surfacing insights that formal feedback mechanisms might miss.

Recruiting students from ENTI 333's diverse enrollment (all faculties) ensures varied perspectives inform material development. Students will be acknowledged in all published materials, and those making substantial contributions will be invited as co-presenters at conferences.

Students as Course Participants

Students in ENTI 333, ENTI 633, and ENTI 674 contribute through their engagement with pilot materials:

- Completing observation worksheets and reflection exercises that reveal how students interact with the game
- Participating in classroom discussions that surface questions, confusions, and insights
- Providing informal feedback on what worked and what didn't

Their experiences directly shape material revisions. This positions students as partners in developing resources that will benefit future learners—a model of students-as-partners that strengthens both the project and participants' sense of contribution to their learning community.

D.6. Describe the impact your project will have on improving teaching and student learning, and link this impact back to your question and the context you described above.

Explain how your work will benefit others, how you will share your findings locally and beyond, and how these impacts will be sustained beyond the funding period for the project. What would successful completion of your project look like? That is, how would it affect the context you described, and how would it provide helpful responses to the question described? How will teaching and learning at the University of Calgary—other academic courses, educators, and contexts—benefit from your project's activities, instruments, or findings? Specify how you will disseminate your findings. (3 points).

Direct Impact on Student Learning

Students in ENTI 333/633 and ENTI 674 will develop deeper generative AI literacy through engaging, low-stakes game-based learning. Rather than approaching AI with anxiety about academic integrity or job displacement, students will engage curiously with AI systems, developing transferable critical evaluation skills. Specifically, students will:

- Understand how large language models actually function, replacing common misconceptions with accurate mental models
- Recognize AI failures (hallucinations, sycophancy, inconsistency) when they encounter them in academic and professional contexts
- Apply critical evaluation skills to AI outputs across domains
- Understand prompt engineering effects, improving their own productive use of AI tools

This represents a shift from surface-level AI tool operation to genuine AI literacy.

Broader UCalgary Impact

The OER curriculum package enables any UCalgary instructor to incorporate AI literacy into their courses without developing materials from scratch. This matters because:

- AI literacy is relevant across all disciplines, yet most instructors lack resources for teaching it
- Openly licensed materials can be adapted for different contexts and levels
- The educator guide lowers adoption barriers by providing facilitation support

Through Taylor Institute presentations and local workshops, the project will reach instructors seeking practical AI literacy approaches. The materials contribute to UCalgary's broader capacity to prepare students for AI-integrated professional environments.

Dissemination Plan

Open Educational Resources:

- Complete curriculum package published through Open Education Alberta (Pressbooks), UCalgary's supported OER platform
- Materials also available on the game website, maximizing accessibility
- All materials licensed CC BY, enabling adaptation without restriction

Conference Presentations:

- Taylor Institute Teaching and Learning Conference (Year 2): Sharing pedagogical approach and materials with UCalgary teaching community
- Administrative Sciences Association of Canada (ASAC) conference: Reaching management education scholars nationally
- Academy of Management Learning and Education: Potential journal submission if pilot results warrant

Invited Talks and Workshops:

- Integration into my existing invited presentations on generative AI, reaching audiences beyond UCalgary
- AI literacy workshop sessions incorporating game-based demonstration

Sustainability:

The project's outputs are designed for sustainability beyond the funding period:

- The game is already built and will continue operating without ongoing funding
- OER materials, once published, remain permanently available through Pressbooks and the game website
- The CC BY license enables others to maintain, update, and adapt materials
- Educator guide enables adoption without ongoing developer support

Successful Completion

A successful project will have produced:

- A stable, classroom-ready game with documented accessibility features
- Four complete lesson plans with aligned learning outcomes
- Student-facing materials (worksheets, reflection prompts, vocabulary guides)
- A comprehensive educator guide enabling independent adoption
- At least two external presentations sharing the approach
- Published OER accessible through Open Education Alberta and the game website

Most importantly, success means students in piloted courses demonstrate improved understanding of generative AI systems, moving from misconceptions and anxiety toward accurate mental models and critical engagement skills that transfer to their academic and professional AI use.

D.7. How have you included consideration of principles of equity, diversity, inclusion, and accessibility (EDIA) in the design and execution of your project? Incorporating principles of EDIA strengthens communities and has been shown to improve the quality, social relevance, and impact of scholarship and practice. How will you strengthen your work by following these principles? (3 points).

Accessibility

The game is free and web-based, removing cost barriers that limit access to educational technology. Students receive sufficient free credits for meaningful educational experiences; instructors can provide additional credits for classroom use. Mobile-responsive design ensures students without laptop access can participate fully.

During Year 1, the project includes an accessibility audit addressing:

- Screen reader compatibility for visually impaired users
- Color contrast meeting WCAG guidelines
- Keyboard navigation for users who cannot use a mouse
- Clear, simple language in all student-facing materials

Representation

The game's "muses" deliberately represent diverse historical figures across cultures, time periods, geographies, and genders, not just the Western canon typically centered in discussions of creativity and achievement. This design choice emerged from careful attention to avoiding both underrepresentation and cultural appropriation; sensitive indigenous figures have been intentionally excluded to respect cultural protocols.

Students see diverse figures engaging with AI and creativity, countering narrow representations of who participates in technology and art.

Inclusive Pedagogy

The observational learning approach may particularly benefit students who feel intimidated by direct AI tool use. Students can engage with AI concepts without needing prior technical skills or comfort with technology.

Curriculum materials include structured discussion protocols (small groups, written reflection options) ensuring participation isn't limited to students comfortable with whole-class verbal contribution.

Research Process

Student RAs will be recruited to reflect the diversity of ENTI 333's enrollment across all faculties. Feedback will be gathered from students across disciplines and levels (undergraduate, graduate, professional master's), ensuring materials work for varied learners.

D.8. Does your project team include an emerging scholar? An emerging scholar can be a graduate student, academic staff, support staff, or postdoctoral scholar listed as a member of your Project Study Team that is participating in a UCalgary Teaching & Learning Grant for the first time.

No

In an effort to encourage scholars to develop their skills in research and scholarship around teaching and learning, we are providing an Emerging Scholar incentive of \$5,000 for successful applications that include emerging scholar(s). This individual must be new to the Teaching and Learning Grants program and not have received a grant previously.

This incentive can be used for any eligible grant expense. This is in addition to the specified maximum award amount for two-year grants (\$10,000) and three-year grants (\$40,000). If you apply for this incentive, please ensure that you incorporate the \$5,000 into your budget request and total funds requested.

D.9. Please list full citations for all sources cited above using a citation style relevant to your context.

Bastani, H., Bastani, O., Sungu, A., Ge, H., Kabakcı, O., & Mariman, R. (2024). Generative AI can harm learning. *Available at SSRN*, 4895486.

Bozkurt, A. (2024). Why generative AI literacy, why now and why it matters in the educational landscape? Kings, queens and GenAI dragons. *Open Praxis*, 16(3), 283-290.

Clark, D. B., Tanner-Smith, E. E., & Killingsworth, S. S. (2016). Digital games, design, and learning: A systematic review and meta-analysis. *Review of Educational Research*, 86(1), 79-122. <https://doi.org/10.3102/0034654315582065>

Fernández-Raga, M., Aleksić, D., İköz, A. K., Markiewicz, M., & Streit, H. (2023). Development of a comprehensive process for introducing game-based learning in higher education for lecturers. *Sustainability*, 15(4), 3706. <https://doi.org/10.3390/su15043706>

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.

Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1-16. <https://doi.org/10.1145/3313831.3376727>

Mertala, P., & Fagerlund, J. (2024). Finnish 5th and 6th graders' misconceptions about artificial intelligence. *International Journal of Child-Computer Interaction*, 39, 100630. <https://doi.org/10.1016/j.ijcci.2023.100630>

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, 2, 100041. <https://doi.org/10.1016/j.caeai.2021.100041>

Pedaste, M., Mäeots, M., Siiman, L. A., de Jong, T., van Riesen, S. A. N., Kamp, E. T., Manoli, C. C., Zacharia, Z. C., & Tsourlidaki, E. (2015). Phases of inquiry-based learning: Definitions and the inquiry cycle. *Educational Research Review*, 14, 47-61. <https://doi.org/10.1016/j.edurev.2015.02.003>

Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist*, 50(4), 258-283. <https://doi.org/10.1080/00461520.2015.1122533>

Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. *Educational Psychology Review*, 32, 77-112. <https://doi.org/10.1007/s10648-019-09498-w>

Wouters, P., van Nimwegen, C., van der Spek, E. D., & van Oostendorp, H. (2013). A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology*, 105(2), 249-265. <https://doi.org/10.1037/a0031311>

D.11. Open Educational Resource (OER) Area of Focus

If you have selected the Open Educational Resource (OER) area of focus, please complete the following questions

For more information on OER or links to resources, please review the [resource guide](#). If you would like to discuss OER with a libraries and cultural services staff member, please [contact them](#) using this form.

D.11.1. Have you already conducted a search for open educational resources that relate to your proposed OER project? You can access the [OER By Discipline Guide](#) or the [Open Course Matching Service](#) for support in getting started with your OER search.

✓ No

D.11.2. Will you be adapting an existing OER, creating a new OER, or developing ancillary/supplemental materials (e.g. question banks, videos, sample exams, etc.)?

		Indicate "Yes" or "No" to all that apply		Additional Information
1	Adapting an existing OER	No	If yes, provide the URL(s) for existing OER:	
2	Creating a new OER	Yes		lesson plans and instructions for using MuseBattle.com as a teaching tool
3	Developing ancillary or supplemental materials	Yes	If yes, indicate the type:	sample exercises and quizzes

D.11.3. It is expected that OER projects will be shared under a [Creative Commons \(CC\) license](#). What Creative Commons License are you planning on applying to your OER project?

Note that the assignment of a CC license does not impact the creator’s copyright ownership of their work.

CC BY (Attribution). This license allows maximum flexibility for adaptation and redistribution while ensuring attribution. The curriculum materials will be openly licensed; the game software itself is proprietary but free for educational use.

D.11.4. Are there platforms or tools that you are currently considering for the development and release of your OER project?

Note: If you are unsure, contact [Libraries and Cultural Resources](#) to discuss your options

Yes. Materials will be published through Open Education Alberta (Pressbooks), UCalgary's supported OER platform, following Libraries and Cultural Resources guidelines. Materials will also be hosted on the Muse Battle game website (musebattle.com) for direct access.

E. Timeline & Budget

E.1. Timeline Upload

Please complete the spending timeline template available on the [grants website](#). Once finalized, print to PDF and upload below.

Note: The timeline for grant activities should be April 1 – March 31.

PDF	TLgrants_Timeline_Templat... (170 KiB download)
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E.2. Budget Summary Upload

Please fill out the budget summary template available on the [grants website](#). Once finalized, print to PDF and upload below.

Note: The budget spending timeline should be from April 1 to March 31. If requested, the emerging scholar supplement should be included in the total funds requested.

PDF	TLgrants_BudgetSummary Te... (232 KiB download)
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E.3. Other Funding

No

Does your project currently have funding from other internal or external sources?

E.4. Total Requested Budget

CA\$10,000.00

\$10,000 maximum for two-year project, or \$15,000 with emerging scholar incentive.
\$40,000 maximum for three-year project, or \$45,000 with emerging scholar incentive.

Log in to universityofcalgary.grantplatform.com to see complete application attachments.

University of Calgary Teaching and Learning Grants - Budget Summary

<https://teaching-learning.ucalgary.ca/applying-for-a-grant#budget-guidelines-and-recommendations>

When complete print to PDF and upload to the Budget section of your application form. Please do not include any identifying information in your budget.

Project Title

Game Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Battle Game

Grant Stream

Development & Innovation (DI)

BUDGET SUMMARY: Include a detailed estimate of expenditures with a rationale for how all spending will support the project's goals

Year 1 (April 1-March 31)

EXPENSE TYPE	RATIONALE <i>(delete categories not used)</i>	Cost
Personnel	<i>Estimate total cost of student (hourly wage x 20% for mandatory employer costs e.g. EI, CPP). Include tasks & calculations</i>	
Research Assistant (Grad)		
Research Assistant (Undergrad)	<i>Five undergraduate students × 50 hours each × \$20/hour. Students will conduct playtesting and bug reporting, develop curriculum material drafts, and gather peer feedback. Distributed across both years to support development and revision cycles.</i>	\$ 2,500.00
Project manager		
Transcription fees		
Travel	<i>* Should NOT exceed 30% of total project budget *</i>	
Non-conference		
Conference		
Materials and supplies	<i>AI-assisted development platform credits for game refinement, bug fixes, accessibility improvements, and feature enhancements. Replit provides the development environment and AI coding assistance used to build and maintain the game.</i>	\$ 3,000.00
Dissemination fees	<i>* Should NOT exceed 30% of total project budget *</i>	
Other (describe)		
Honorarium and cultural protocols		
Participant incentive		
Total Year 1		\$ 5,500.00

University of Calgary Teaching and Learning Grants - Budget Summary

<https://teaching-learning.ucalgary.ca/applying-for-a-grant#budget-guidelines-and-recommendations>

When complete print to PDF and upload to the Budget section of your application form. Please do not include any identifying information in your budget.

Project Title	Game Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI vs Battle Game
Grant Stream	Development & Innovation (DI)

BUDGET SUMMARY: Include a detailed estimate of expenditures with a rationale for how all spending will support the project's goals

University of Calgary Teaching and Learning Grants - Budget Summary

<https://teaching-learning.ucalgary.ca/applying-for-a-grant#budget-guidelines-and-recommendations>

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Project Title

Battle Game

Grant Stream

Development & Innovation (DI)

BUDGET SUMMARY: Include a detailed estimate of expenditures with a rationale for how all spending will support the project’s goals

Year 2 (April 1-March 31)		
EXPENSE TYPE	RATIONALE (delete categories not used)	Cost
Personnel	Estimate total cost of student (hourly wage x 20% for mandatory employer costs e.g. EI, CPP). Include tasks & calculations	
Research Assistant (Grad)		
Research Assistant (Undergrad)	Five undergraduate students × 50 hours each × \$20/hour. Students will conduct playtesting and bug reporting, develop curriculum material drafts, and gather peer feedback. Distributed across both years to support development and revision cycles.	\$ 2,500.00
Project manager		
Transcription fees		
Travel	* Should NOT exceed 30% of total project budget *	
Non-conference		
Conference		
Materials and supplies	AI-assisted development platform credits for game refinement, bug fixes, accessibility improvements, and feature enhancements. Replit provides the development environment and AI coding assistance used to build and maintain the game.	\$ 2,000.00
Dissemination fees	* Should NOT exceed 30% of total project budget *	
Other (describe)		
Honorarium and cultural protocols		
Participant incentive		

University of Calgary Teaching and Learning Grants - Budget Summary

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When complete print to PDF and upload to the Budget section of your application form. Please do not include any identifying information in your budget.

Project Title	Game Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Literacy Battle Game
Grant Stream	Development & Innovation (DI)

BUDGET SUMMARY: Include a detailed estimate of expenditures with a rationale for how all spending will support the project's goals

Total Year 2	\$	4,500.00
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University of Calgary Teaching and Learning Grants - Budget Summary

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When complete print to PDF and upload to the Budget section of your application form. Please do not include any identifying information in your budget.

Project Title	Game Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Battle Game
Grant Stream	Development & Innovation (DI)

BUDGET SUMMARY: Include a detailed estimate of expenditures with a rationale for how all spending will support the project’s goals

Year 3 (April 1-March 31)	N/A for Development and Innovation grants	
EXPENSE TYPE	RATIONALE (delete categories not used)	Cost
Personnel	Estimate total cost of student (hourly wage x 20% for mandatory employer costs e.g. EI, CPP). Include tasks & calculations	
Research Assistant (Grad)		
Research Assistant (Undergrad)		
Project manager		
Transcription fees		
Travel	* Should NOT exceed 30% of total project budget *	
Non-conference		
Conference		
Materials and supplies	Hardware, software, additional items to be purchased	
Dissemination fees	*Should NOT exceed 30% of total project budget *	
Other (describe)		
Honorarium and cultural protocols		
Participant incentive		
Total Year 3	\$	-
PROJECT TOTAL	\$	10,000.00

University of Calgary Teaching and Learning Grants Timeline Template

Please fill out the following timeline for your project using a gantt chart. Please do not include any identifying information.

Project Title

Game-Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Art Battle Game

Grant Stream

Development & Innovation (DI)

When complete print to PDF and upload to the Timeline section of your application form

Timeline

** The timeline for grant activities should be April 1 - May 31. **

[illegible]

University of Calgary Teaching and Learning Grants Timeline Template

Please fill out the following timeline for your project using a gantt chart. Please do not include any identifying information.

Project Title	Game-Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Art Battle Game
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Grant Stream	Development & Innovation (DI)
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When complete print to PDF and upload to the Timeline section of your application form

Timeline ** The timeline for grant activities should be April 1 - May 31. **

Year 2													
Activity	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
Material revision													
Expanded pilot (ENTI 333/633/674)													
Educator guide development													
OER publication (Pressbooks)													
Conference presentations													
Local dissemination													

University of Calgary Teaching and Learning Grants Timeline Template

Please fill out the following timeline for your project using a gantt chart. Please do not include any identifying information.

Project Title

Game-Based Learning for Generative AI Literacy: Developing Curriculum Materials for an AI Art Battle Game

Grant Stream

Development & Innovation (DI)

When complete print to PDF and upload to the Timeline section of your application form

Timeline

** The timeline for grant activities should be April 1 - May 31. **

[illegible]