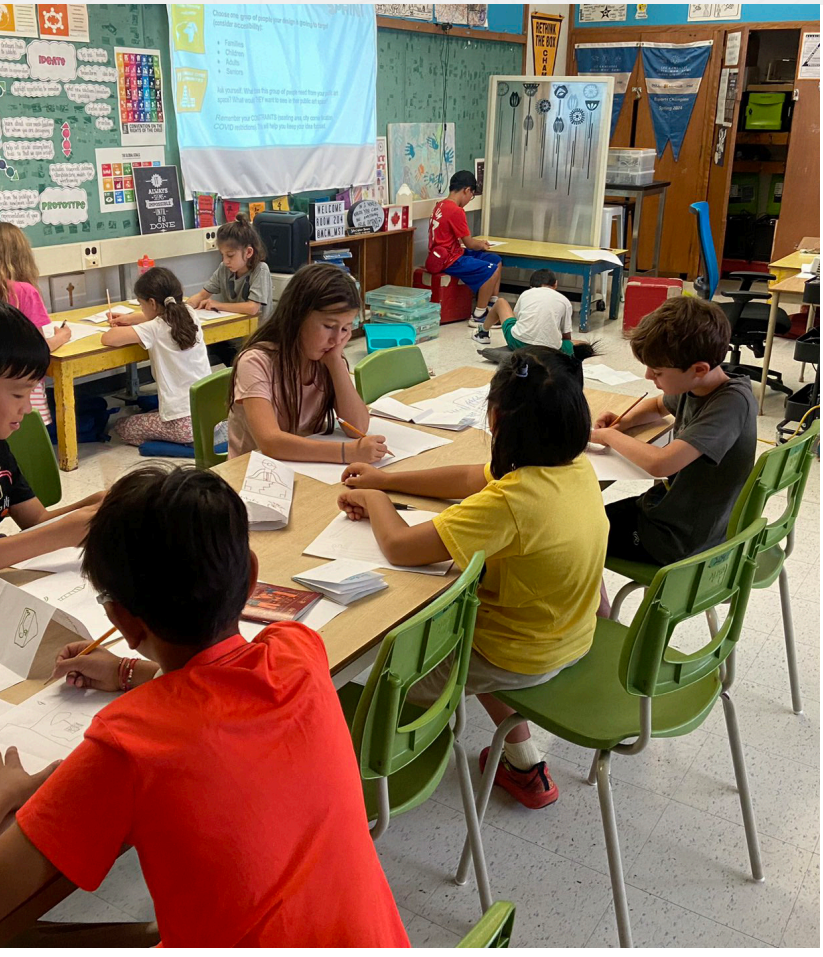
Enhancing Elementary STEM and AI Exploration

PROBLEM OF PRACTICE

How might classroom teachers effectively use design thinking as a pedagogical approach to enhance student learning and creativity, while incorporating AI as a companion tool to support and enrich the design process? Design thinking is a powerful framework that encourages students to engage in creative problem-solving, critical thinking, and collaborative learning. By integrating AI tools into this process, teachers can provide students with additional resources and support, enabling them to explore innovative solutions and gain deeper insights into their projects.



tdsb
Toronto District School Board

District: **McMurrich Junior Public School, Toronto District School Board**

Province: Ontario

Date: October 2024

Leads: Zelia Capitao-Tavares, Teacher

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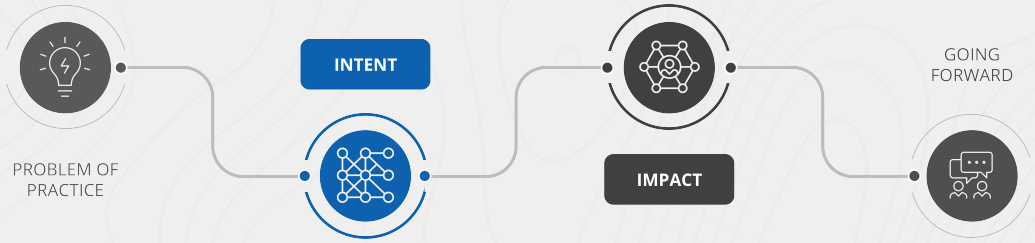


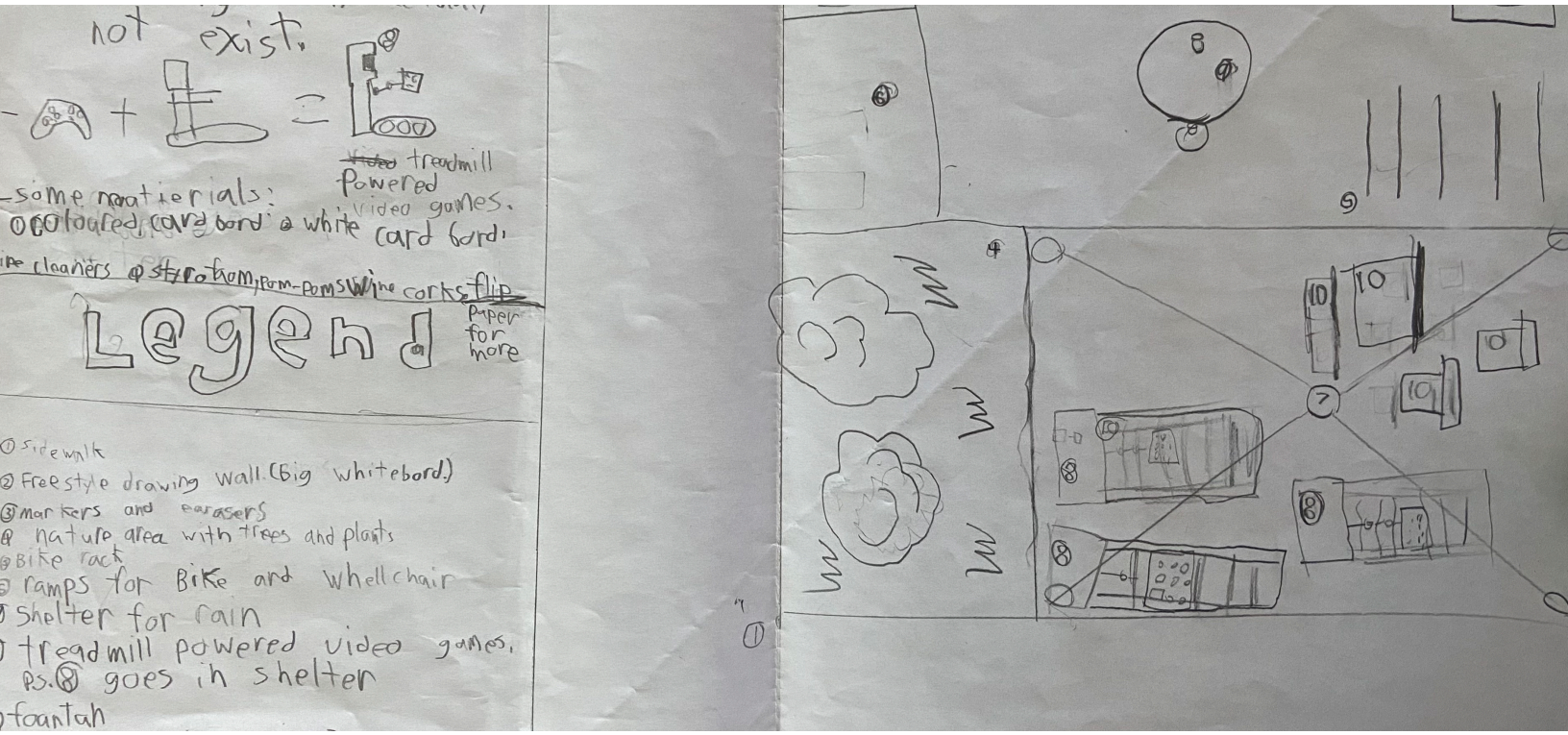
Intent

AI is supporting our project by assisting students with their thinking and visualization. As students use the AI image generator to help with their design thinking, we hypothesize that it will support students in seeing their vision clearly, setting more realistic replications of their potential designs, and helping them with deeper brainstorming during the design thinking process. Students can make their ideas clearer and more succinct as they make iterations to their designs.

The plan is to guide students through the design thinking process by first creating a blueprint of their prototype without AI and then creating one with AI to observe the changes. This approach aims to compare the effectiveness of traditional design methods with AI-assisted design, providing insights into how AI can enhance creativity and problem-solving in educational settings.

Adobe Creative **https://new.express.adobe.com/** AI Image Generator

> "The plan was to guide students through the design thinking process of the urban design project, create a blueprint of their prototype without AI, and then do one with an AI image generator. The students then had to compare and contrast the two prototypes and create the best build design possible."
>
> —Zelia Capitao-Tavares, Teacher



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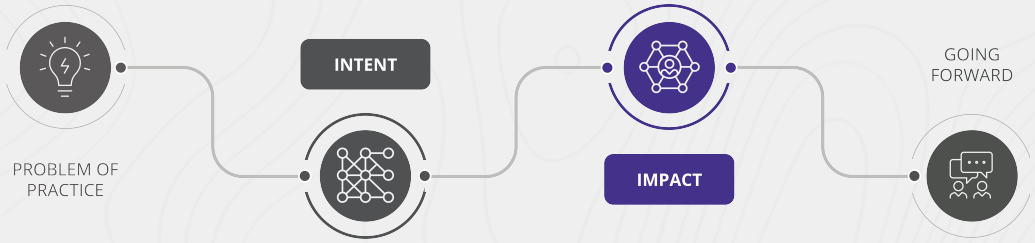

Impact

- **Student Engagement:** Exploration and time spent with the Adobe Creative AI Image Generator brought joy as students tried something new and saw the potential of AI to enhance their learning.
- **Idea Generation:** Students created new ideas while critically evaluating the sources of images and information, understanding the importance of multiple attempts rather than committing to the first iteration.
- **Critical Assessment:** Students critically assessed AI-generated images, questioning their validity and reliability, and retained the final say in how to use the information, ensuring proper credit to sources.
- **Efficiency:** AI freed up students to focus on other tasks, allowing time to compare and contrast ideas.
- **Creative Thinking:** AI served as a springboard for idea generation, without replacing students' creative thinking, though there was concern about AI potentially limiting their own ideas and creative control.
- **Technical Challenges:** AI generative images, once created, required complete regeneration for any alterations, which posed a challenge. Students used the AI image generator to inform their prototypes, hoping to save time.
- **Prompt Writing Skills:** Students developed skills in writing clear prompts using dynamic keywords and adjusting them to achieve their intended goals in the search.

Professional Learning insights

Ongoing guidance provided by the PL Coaches continues to be of great value to refine our thought process in keeping it focused, purposeful and attainable to work towards achieving our goal. The regular check-ins both email and phone calls are greatly appreciated as a sound board!

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Going Forward

Explicit Teacher Instruction:

- **AI Understanding:** Lessons designed to support student understanding of AI and the differences between descriptive, prescriptive, and generative AI. Ongoing discussions will cover the origins of images, the learning behind AI prompting, and issues of bias, privacy, and ownership of materials used by AI.
- **Deconstructing AI**: Lessons aimed at deconstructing the how and why of AI image generation, emphasizing that AI is not a shortcut to avoid tasks or inquiry but a tool to enhance learning and creativity.

See the teacher presentation for this project:
http://c21canada.org/wp-content/uploads/2024/11/ONT-TDSB1-Resource-MyPublicArtSpace.pdf

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