

Beyond the Vocabulary List

A Reflection on Integrating Climate Literacy in a Cross-disciplinary Project in a Language Classroom

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Abstract

This reflection examines a cross-disciplinary, project-based Mandarin immersion curriculum designed to integrate English Language Arts (ELA) and Science units on wild animals' habitat and ecological crises in a third-grade classroom. Moving beyond print-based instruction, I reflect on using multimodal pedagogy to alleviate the "linguistic bottleneck" where primary students' complex, higher-order climate awareness outpaces their novice-stage target language proficiency. The narrative details critical pedagogical struggles—ranging from the limitations of static vocabulary lists to the emergence of profound student climate anxiety (eco-grief). To ground abstract ecosystem parameters and process heavy climate emotions, I pivoted to incorporate picturebooks, physical movement such as Tai Chi (Cloud Hands) and Daoist cosmological lenses (Yin-Yang and Tian Ren He Yi). Leveraging non-Western cultural assets allows young immersion learners to bypass linguistic bottlenecks, transform eco-anxiety into actionable daily advocacy, and embody a relational, non-dominant worldview.

Keywords

Cross-disciplinary immersion, multimodal literacy, ecojustice education, somatic pedagogy, deep time

Introduction

As a first-year third grade language immersion teacher, I am constantly challenged to instruct a dense set of vocabulary and language points from a mandated curriculum while aligning them with English Science and ELA Tier 2 academic vocabularies under strict classroom time constraints. At the same time, climate change and the cultivation of sustainable ecological communities have become pressing issues that our students need to become aware of and act on. I decided to design a project-based thematic unit that emphasizes critical awareness, inquiry-driven research for environmental solutions, and authentic student advocacy.

This project-based unit leverages students' natural passion and love for wild animals and nature to push them toward a deeper understanding of ecosystem niches, habitat crises, and the direct impact of human behaviors on the biosphere. Ultimately, the unit encourages students to take the initiative in advocating for animals and the natural world. This unit optimizes limited instructional time by directly aligning with state and national subject standards, including Minnesota ELA (3.2.1.1, 3.2.2.2), Minnesota Science (3L.4.1.1.1, 3L.3.2.1.1), WIDA Language Standards for ELA and Science (Standards 2 and 4), and ACTFL Interpersonal & Presentational Proficiency Standards (1.1, 1.3) (Cutshall, 2012; Minnesota Department of Education, 2019, 2020; WIDA, 2020).

Through active cooperation with the English science and ELA teachers, this thematic unit invites content knowledge directly from students' English blocks, transforming it into tools for critical L2 research and inquiry. Students were divided into groups organized by their self-selected animals' geographic habitats to study how everyday human actions alter environments and impact wild animals. Furthermore, after exploring the mechanics of the greenhouse gas effect, students were inspired to advocate for sustainable, eco-friendly daily routines.

By integrating touching literature, embodied robotic geography navigation, 3D habitat building and mindful Tai Chi movements, students successfully built an understanding of how all living systems are intricately intertwined. Through these multiple modes, students explored how human stewardship and guardianship for the natural world can be developed. This exploration ultimately led the classroom to ponder a deeper question: how can humankind and nature achieve a better, more harmonious state of coexistence, rather than humans simply seeking to dominate the natural world?

Framework

The Bridge model (Beeman & Urow, 2013) assists educators in designing explicit instruction for language transfer within content-area learning. This framework serves as an essential step for preparing students to utilize target language (L2) academic structures, providing a solid foundation for further deepening their content comprehension. Following that linguistic transition, subsequent classroom discussions use these newly acquired L2 terms to develop critical cross-cultural comparison and analysis. For example, once the direct translation of an "ecosystem" is established, the concept can be integrated into Daoist philosophy and the unity of nature and humanity (Tian Ren He Yi) (Laozi, 2006, Chapter 42) within the Chinese language setting—a positioning that is naturally coherent with EcoJustice education theory (Martusewicz et al., 2020). Similarly, comparing the concepts of industrial "development" versus ecological "cycles" allows students to ponder the relationship between nature and humankind, directly reflecting the theoretical contrasts between Western anthropocentric perspectives and Eastern relational worldviews.

The unit takes place in three third grade Mandarin Chinese immersion classrooms with 72 students, where the listening and speaking ability ranges from Novice Mid to Intermediate Mid, the reading ability ranges from Novice Mid to Intermediate Low, and the writing ability ranges from Novice Low to Novice High (Cutshall, 2012).

Data sources

Grounded in the traditions of practitioner inquiry, my reflection relies on a qualitative review of student work collected during the unit. This material includes ten pieces of my own teacher reflection journal entries, approximately 48 students' text analysis entries, 93 students' digital multimedia entries hosted on our classroom platform, 144 written responses, equally divided between responsive and free-writing exercise, and 156 student-produced multimodal artifacts (consisting of hand-draw maps, 3D habitat making, and environmental posters).

Reflective Analysis

Instead of grading language skills through rigid tests, I looked through these materials to find common patterns and themes. I read over my journal entries and what we said during lessons to spot exactly where students got frustrated, where their language skills held back their big ideas, and how their feelings changed over time. I also looked at the students' projects and stories to see how smoothly they used every day spatial words and how well they expressed an awareness of the environment. Finally, I connected these

common themes to ecojustice ideas and Daoist philosophy to map out my own journey as a teacher and see how my lessons evolved.

Cycle 1: Embodied Cognition in Spatial Navigation

In the first month of this unit, students successfully transferred their background knowledge from ELA and science into Chinese, utilizing visual graphic organizers to map out animal body features and habitats. Through traditional L2 language practice tools, students demonstrated that they were able to describe animal physical traits, habitat environments, and basic food webs. However, when introduced to more complex verbs in dynamic scenarios—such as migrating for food and shelter, or explaining how plant and animal life shifts along changes in latitude—the students became confused. Although I provided mentor texts alongside AI-generated pictures and videos (Figure 1), a significant number of students still struggled with the underlying logic and their subsequent language output. At this moment, I knew that multimodal pedagogy (Kress, 2010) needed to kick in. To support the development of their comprehension and language production, I introduced a series of individual and collaborative tasks, including food web mapping, travel route design, robotic navigation instructions, 3D habitat construction, and cross-grade-level presentations. During my post-lesson reflection, a compelling instance of student narration was captured from an anonymous video file. Navigating a purely visual map completely devoid of Chinese characters, Student A stated:

机器人一从雪山高原往前走40厘米，往右转，再往前走，走到森林和池塘，往前走，就到了地下，森林里面住着大象，大熊猫，池塘里面住着乌龟。

[Once the robot comes out from the icy mountain, walks 40 cm, turns right, walks straight again, he arrives in the forest and the pond, walks forward, he arrives underground. Elephants and pandas live in the forest, and turtles live in the pond.]

And in another video file, Student B with higher language ability narrated with sentence structure notation by herself as:

3号的机器人从地下出发，往右转，向前走到了森林，森林里住着穿山甲，左边是池塘，池塘里住着鱼，再往前走，是雪山高原，雪山高原住着雪狐。他向右转30步，走到北极。北极里住着雪鸮。

[Robot No.3 left from underground, turn right, go straight to the forest, the pangolin lives in the forest. On the left, it's a pond. Fish live in the pond. Further straight forward, it's a snowy mountain, and an Arctic fox lives there.]

In summary, students were highly engaged through all five different multimodal activities and different levels of students' language output both orally and written showed that students' higher-level thinking, deeper content understanding and higher level of academic vocabulary memory and usage at the end of this cycle.

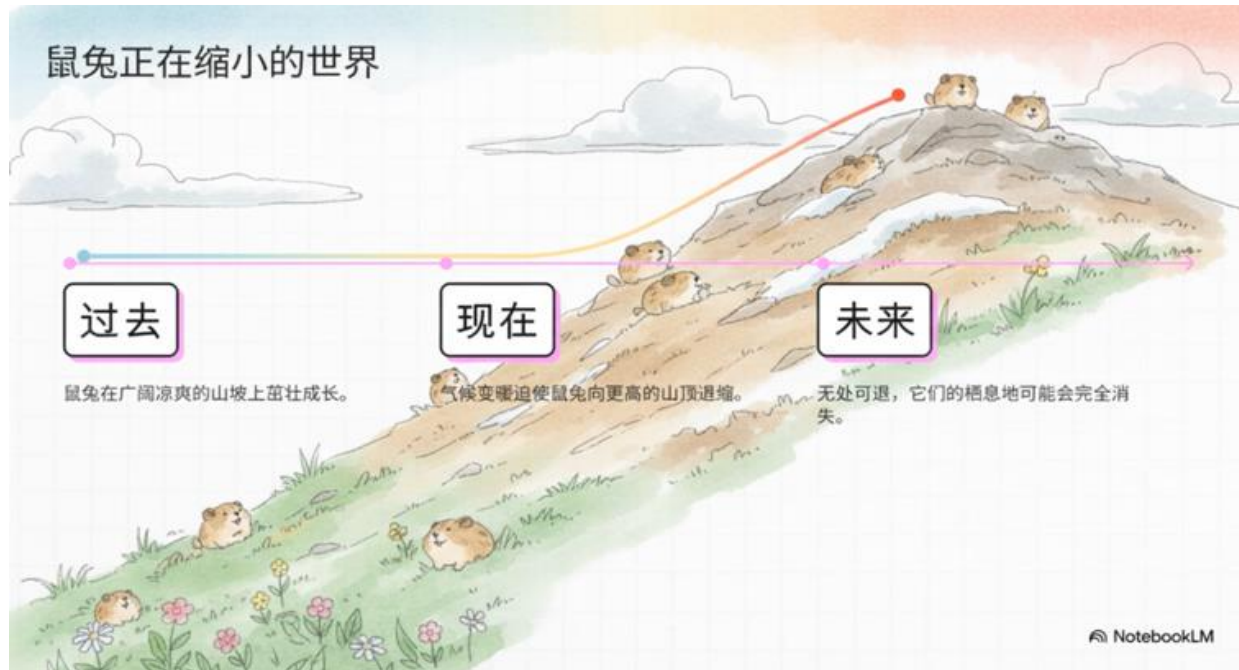


Figure 1: Chinese explanation of Pika's migration through time and increased temperature.
Generated by Notebook LM.

Cycle 2: Wordless Literature and Narrative Advocacy

After the first month of instruction, student expressions of eco-grief and anxiety began to surface, accompanied by more passive and somber language in their video reflections—including terms like “dying,” “sad,” “no food,” “disappearing,” and “extinction.” Confronted with the challenge of how to help them cope with these heavy emotions, I introduced a blend of non-fiction and fiction texts. I shared several videos demonstrating how advanced technologies utilize waste incineration and ocean-cleaning initiatives; however, the students' anxiety remained palpable. I found myself deeply considering how to relieve them of the overwhelming burden that they personally carried full responsibility for the Earth's health and the future of wild animals. Reflecting on my

own concepts of humankind and nature, I recalled how Daoist and Confucian philosophies emphasize that humans are small in the presence of Mother Nature, encouraging us to awe, respect, and follow the "Dao" inherent in the natural world. I wondered how I could convey this profound idea to young students who had subconsciously absorbed Western anthropocentric worldviews.

After searching existing children's literature, I discovered the perfect mentor text: Aaron Becker's wordless picturebook, *The Tree and the River*. Because the book contains no written text in any language, students were pushed to read the illustrations and form their own interpretations of the underlying themes. At the same time, they were completely freed from the linguistic anxiety of decoding complex target-language vocabulary, allowing them to immerse themselves fully within and between the pages. Moving from silent thinking and writing time to small-group and whole-class discussions, and supported by abundant processing time and reflective space, the students' eager expressions of understanding reached a clear peak. Through their individual sharing and engagement, I recorded insightful student observations, including:

- 人要更多土地，更多水和更多的人，他们就打仗。[Humans want more land, more (parts of the) river and more people so they have fights.]
- 河水越来越少，树很不开心。[The river is shrinking, (and) the tree is not happy.]
- 他们改变了河的路，因为他们想要更多的地。[They changed the river channel, because they wanted more land.]
- 人没了，大自然还有。[Humans disappeared, and nature is still there.]
- 有新的树，还有小朋友。他们在听妈妈说以前的故事” [There are new trees, and kids. They are listening to mom tell old time stories.]

These comments were beautifully inspired and showed students' understanding of Deep Time and Unity of Humankind and Nature (Dao Dejing). Through the discussion among different human tribes, river, tree and the wild animals, students experienced the change of the tension between different things through time, and further understood that everything is connected while changing, which is reflecting Yin and Yang theory in Daoism. To embody this concept, I taught students a movement in Taichi – 云手 the Cloudy Hand, which is originally Daoism Kongfu. In this simple movement, we need to keep moving the position of two hands to form circles, switching the body gravity between two legs to keep the moving flow. Along with the breath, students can feel the endless flow generated inside, while the core of the body and the head keeps straight

and balanced. Just like how nature and humankind are united (Tian Ren He Yi), while everything changes in cycles.

Students felt how humankind, nature and wild animals' faith were intertwined, while growing tenaciously individually, which greatly decreased their feeling of effortlessness in changing the big picture of environment damage, switching to focus on daily actionable behaviors. As the output in this cycle, students made eco-friendly action advocacy posters in Chinese without prompts and the minimum level of language support in different themes. Some are focused on preserving the habitats, some focused on saving typical animals, some focused on step-by-step instruction of sorting waste. From my observations, student participation increased, including the students whose oral language ability remained Novice Low.



Figure 2: Students' posters

Going Forward

Through this cross-disciplinary exploratory unit, I realized that navigating today's changing educational landscape as a primary Mandarin immersion teacher forces me to constantly balance big-picture goals with daily classroom realities. At the macro level, I kept asking myself how to truly cultivate modern global citizens who care about the planet. At the micro level, I faced a very real, practical dilemma: how to collaborate with other subject teachers to respect my students' learning holistically while avoiding the boredom of content overlap. At the same time, I had to manage the deep frustration students feel when their high-order thinking outpaces their developing, novice-stage target language skills—a major linguistic bottleneck in immersion classrooms.

Language is never just a mechanical tool; it is a cultural carrier that opens spaces for different ideas and worldviews to meet. Throughout this exploratory unit, I used a continuous cycle of reflection and iteration to fine-tune my teaching, though the process was far from linear. Despite inviting students' interests and drawing from their knowledge in other subjects, it was truly frustrating that students were initially not engaged enough; language learning was purely seen as a vocabulary list aligning with their content knowledge in English. When discussing food webs, students preferred to use a large amount of English to express animal names and habitats—the Tier 2 academic language—even though these terms had been provided multiple times. That was the moment I realized there was more to do. By implementing multimodal tools, students were given enough time and space to build a deeper understanding of both the content knowledge and their language ability through rich, multi-layered interaction: teacher-student, peer-to-peer, and student-to-digital interfaces.

A similar frustration showed up when students' emotions surrounding eco-anxiety emerged. After introducing Yin and Yang in Daoism, exploring advanced technology, and guiding them through environmental advocacy poster-making, their mood became calmer and more self-managed. However, for some students, the Unity of Humankind and Nature was still a little too abstract, and more suitable activities besides Tai Chi are yet to be explored.

Ultimately, this practitioner journey facilitated a deeper understanding of my own pedagogical agency within the dual-language immersion classroom. Activating cultural assets from myself and continually piloting pressing issues with standardized language instruction, I can be an active cultural mediator placing language acquisition within meaningful global issues and employ multimodal methods to balance students' high

cognitive ability and not-yet L2 language ability, furtherly inspire students' curiosity of different narration of relationship among humankind and nature. The practice confirms that the dual-language classroom can serve as a dynamic space where a reflective teacher can utilize diverse philosophical lenses to foster holistic, empathetic, and critical global citizens.

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