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Learning in Relation: A Guide to Creating Online Indigenous Language Courses that Center Indigenous Ways of Knowing and Being

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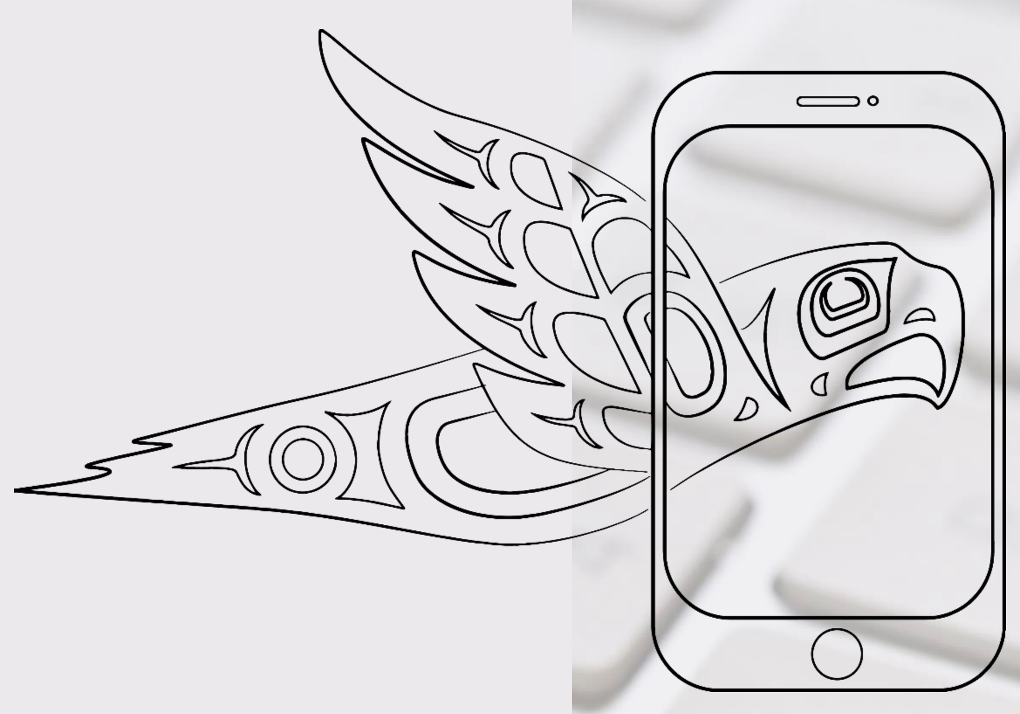

LEARNING IN RELATION

A Guide to Creating Online Indigenous Language Courses that Center Indigenous Ways of Knowing and Being

Kari A. B. Chew, Ph.D. (Editor & Author)
Melvin Calls Him Jr. (Author) • Jackie Dormer (Author) • Courtney Tennell (Author)

About

The purpose of this guide is to share knowledge with Indigenous Nations and organizations, technology developers, and scholars who are working to center and respect Indigenous ways of knowing and being in online Indigenous language revitalization spaces, including Indigenous language courses.

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The layout was designed by Kari A. B. Chew and features the artwork of Namgis First Nation graphic artist Jamin Zuroski.

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OPENING **LETTER**

Chokma, Osiyo, Aho, Taanshi, Greetings,

Welcome to this guidebook about creating Indigenous language courses! We are part of an Indigenous-led team researching how Indigenous Peoples plan and create Indigenous language courses. We are especially interested in how these courses center relational epistemologies to support Indigenous language revitalization and reclamation (ILR). Through our research, we found that there are over 100 Indigenous language courses created on 7000 Languages, Duolingo, Drops, Mango Languages, Memrise, Rosetta Stone, and others. Courses created in partnership with Indigenous Nations, communities, and organizations take years of work and involve teams of people with specialized knowledge of the language and the technology. We have created this guide to help Indigenous Nations, communities, and organizations plan and create online Indigenous language courses that center Indigenous ways of knowing and being. We hope that this guide is also useful to students, researchers, technology providers, and others interested in this topic.

Dr. Kari A. B. Chew conceptualized this project while working on Chickasaw Rosetta Stone–a collaboration between the Chickasaw Nation and Rosetta Stone. The resources offered by Rosetta Stone were mostly for teaching skills related to business and tourism in widely spoken languages. These resources did not apply to the Chickasaw or ILR context, and so the Chickasaw development team created our own curriculum. Instead of teaching things like how to navigate an airport, we worked to center family relationships, connection to place, and cultural knowledge. This experience inspired Chew to learn more about how other Indigenous Nations, communities, and organizations were using technology to support ILR and to help create resources.

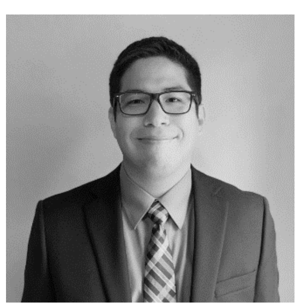
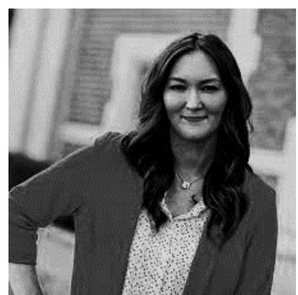
This guide brings together work on interrelated projects we are involved in. Melvin Calls Him Jr. and Courtney Tennell are research assistants at the University of Oklahoma who worked with Chew on projects about relationality in online Indigenous language learning. Jackie Dormer is a research coordinator with the NEȾOLNEW "one mind, one people" Indigenous Language Partnership at the University of Victoria. With Chew, she works on a participatory action research (PAR) project about creating online Indigenous languages courses. Partners on the PAR project include NEȾOLNEW, 7000 Languages, Prairies to Woodlands Indigenous Language Revitalization Circle (Heather Souter and Olivia Sammons), and Hase' Language Revitalization Society (Sara Child). Outcomes of the PAR project have informed this guide.

By sharing information and examples in this guide, we seek to offer something that is both inspiring and practical. We invite you to celebrate with us the amazing work that Indigenous Peoples have done and are continuing to do to create online Indigenous languages courses that reflect community goals and aspirations.

Yakkookay, Wado, Wíbđahà, Marsii, Thank you,

Kari A. B. Chew (Chickasaw)
Melvin Calls Him Jr. (Ponca & Muscogee Creek)
Jackie Dormer (Métis)
Courtney Tennell (Cherokee)

MEET THE **CONTRIBUTORS**

Editor and Author
Kari A. B. Chew, Ph.D., is a Chickasaw citizen and Chikashshanompa' (Chickasaw language) learner based in the Chickasaw Nation. As a scholar-educator, Dr. Chew's work contributes to intergenerational Indigenous language revitalization and reclamation. She holds a doctorate in Indigenous Language Education and Linguistics from the University of Arizona. She was a postdoctoral fellow with NEȾOLN̲EW̲ "one mind, one people" at the University of Victoria and a professor of Indigenous Education at the University of Oklahoma. She currently works with the Chickasaw Nation on language education projects, including Chickasaw Rosetta Stone.

Author
Melvin Calls Him Jr. is from the Ponca and Muscogee Creek Nations of Oklahoma and was born and raised in Oklahoma. He is a Ph.D. candidate in the Adult and Higher Education program in the department of Educational Leadership and Policy Studies at the University of Oklahoma. His current research encompasses American Indian men and college access.

Author
Jackie Dormer is of Métis, German, Irish, and Polish ancestry and grew up in Treaty 1 Territory and the homeland of the Métis Nation (Winnipeg, Manitoba). She received her bachelor's degree in Linguistics from the University of Manitoba in 2020 and is now working towards a degree in Native Studies. She is a research coordinator for NEȾOLN̲EW̲. She hopes to continue supporting language revitalization projects, especially those involving the Michif language.

Author
Courtney Tennell is a citizen of the Cherokee Nation and a doctoral student in the department of Educational Psychology at the University of Oklahoma Jeannine Rainbolt College of Education. She is a Razorback-Sooner Scholar at the Zarrow Institute on Transition and Self-Determination. Her research focuses on Indigenous special education, postsecondary transition and postsecondary transition resources provided to Indigenous students.

ABOUT **ONLINE INDIGENOUS LANGUAGE COURSES**

Kari A. B. Chew

Indigenous Nations and organizations typically create online courses for their languages in partnership with language education technology providers like 7000 Languages, Duolingo, or Rosetta Stone. These courses are a type of computer-assisted language learning (CALL) technology. While there are over 100 Indigenous language CALL courses currently available on various platforms, information about how CALL can support Indigenous language revitalization and reclamation (ILR) is limited. Our research considers how Indigenous Peoples enact relationality in Indigenous language CALL courses.

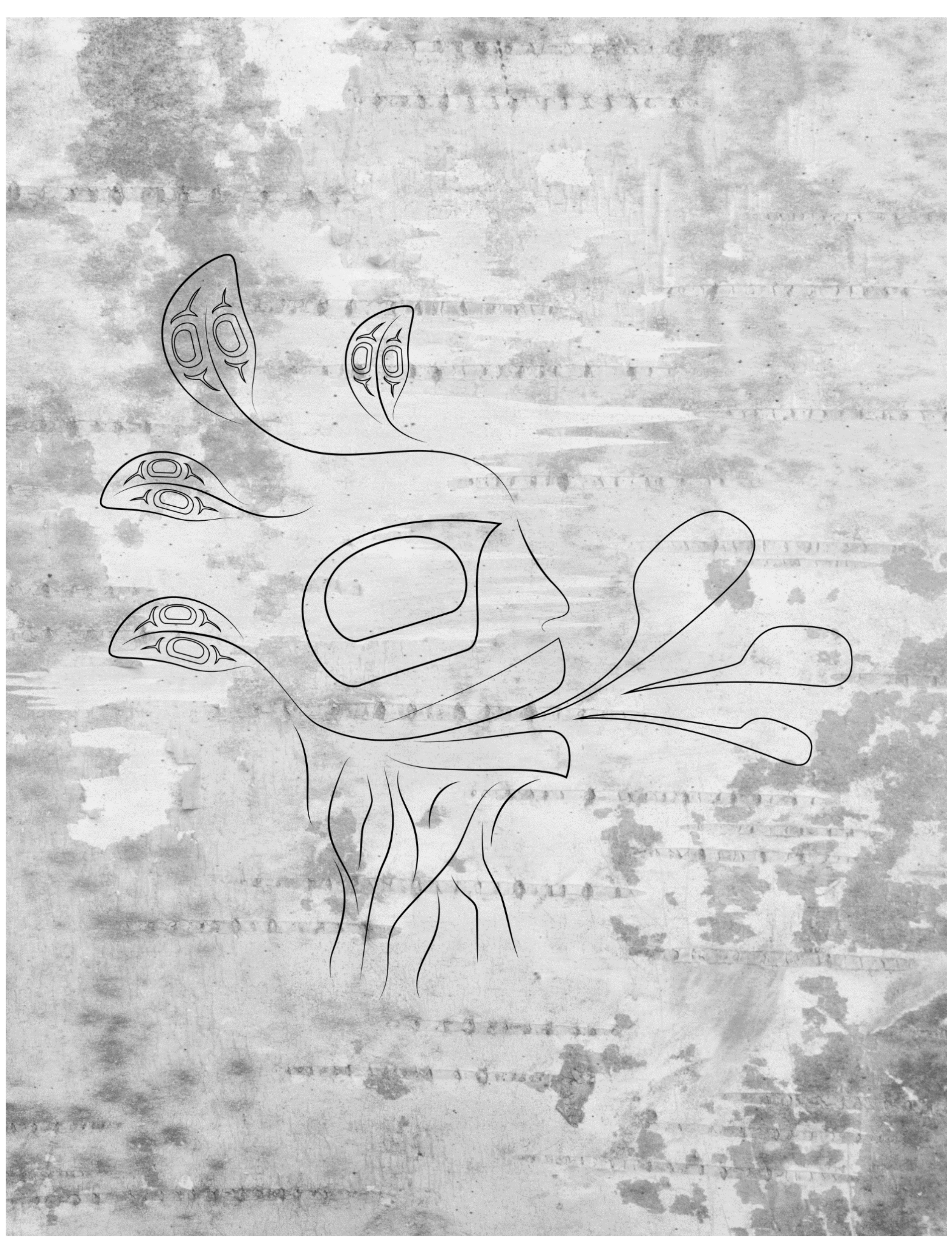
In many Indigenous cultures, relationships between people, land, plants, animals, spirits, and languages "do not merely shape reality, they are reality" (Wilson, 2008, p. 7; Hermes et al., 2012). For this reason, ILR is not just about learning and teaching languages effectively, but also "retain[ing] the worldview and understandings within the language–what can be thought of as the spirit of the language" (Rosborough et al., 2017, p. 430). CALL courses can create new opportunities to build and strengthen relationships that honor the spirit of the language (Alexander, 2018), but there are obstacles to enacting relationality as "place, relationships, and community building become virtual constructs" (Restoule, 2019, p. 1298).

For Indigenous Peoples who are displaced from their lands, have diasporic populations, and/or have few or no language speakers, CALL courses can be helpful to ILR efforts. The self-guided asynchronous learning environment enables learners to connect to the language at any time and from anywhere (Alexander, 2018), providing a sense of agency in language learning (de Bruin & Mane, 2016). Whereas one language teacher can only support a limited number of students at a time, a CALL course can support thousands of learners, some of whom may form their own language learning communities (Chew & Hinson, 2022). Indigenous language CALL courses have also been shown to support home-based family language immersion (Hermes & King, 2013).

While CALL courses offer many benefits, the technologies, especially when created and controlled by Western for-profit companies, can be a "double-edged sword" with the potential to undermine ILR (Galla, 2016, p. 1139). Technology is "the extension of the knowledge and belief system which has led to its creation" (Meighan, 2021, p. 2) and can therefore act as "yet another form of colonization that reinforces the Western-based dominant modes of knowledge systems and worldviews" (Galla, 2018a, p. 104). Some call this reinforcement a form of "digital colonialism," or a "structural form of domination of the digital ecosystem" (Kwet, 2018, p. 2). Indigenous course creators may have to find ways to "exploit" (Galla, 2018a) the system or find creative solutions within the confines of the technology to center cultural values, teach unique linguistic features of the language, and build relationships with learners.

Decolonizing virtual spaces, including CALL courses, requires Indigenous leadership in "all aspects of technology development" (Brinklow, 2021, p. 240) to ensure that the needs, values, and aspirations of Indigenous Peoples are prioritized. This prioritization ensures that Indigenous Nations and organizations maintain ownership of their data and intellectual property and protects against the appropriation of Indigenous knowledges (Galla, 2018b). Because online Indigenous language courses can take years to create (Westwood, 2017), involve teams of people with specialized knowledge and training (Chew et al., 2022), and often require a large financial investment, they cannot be viewed as a "quick fix" or solution to ILR. Successful courses involve meaningful Indigenous-led partnerships and are part of a long-term, multifaceted language plan.

Image: Two Métis children look at laptop



POPULAR ONLINE COURSE **TECHNOLOGY PROVIDERS**

Melvin Calls Him Jr. & Kari A. B. Chew

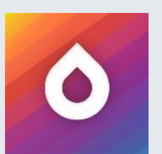
This section provides an overview of popular online course technology providers. While there are additional online course technology providers (for example, Babbel), we focus on those currently offering Indigenous languages.

7000 LANGUAGES

Established in 2016, 7000 Languages is an independent non-profit organization that supports Indigenous language revitalization efforts in the United States and internationally through free online language courses. 7000 Languages uses the Transparent Language platform, which was donated by the company. Currently, 7000 Languages offers 54 courses in 28 language courses created in partnership with communities from across the world. 7000 Languages works to respect data sovereignty, holding that the data and language content belong to the Indigenous Nations, communities, and people who partner with the non-profit. 7000 Languages stands out because of its explicit commitment to supporting language revitalization and working in partnership with Indigenous and marginalized communities. **Indigenous languages: Hän, Kwakʼwala, Kaqchikel, Nahuatl, Sisseton Dakotah, Michif, and more**

CUDOO

In 2016, Cudoo began as a start-up focused on online skill-based education including but not limited to languages. Cudoo offers over 160 languages, including some Indigenous and less commonly taught languages. Cudoo is unique because of its focus on teaching language for business. For example, a Māori for Business course includes lessons on speaking about one's company and describing products. Cudoo does not provide information about community partnerships or data sovereignty. The company offers certificates following the completion of courses but does not specify whether it has permission from communities to issue these. Unlike other platforms, Cudoo charges directly for use of Indigenous language courses. **Indigenous languages: Diné bizaad (Navajo), Hawaiian, te reo Māori, Saami, and more**



DROPS

Drops was founded in 2015, with a focus on teaching vocabulary through word puzzles and image-audio associations. It was acquired by the game-based learning company Kahoot in 2020. Drops is distinguished by teaching language as five-minute bites of game-based content. The five-minute language bites approach aims to replicate the experience of scrolling social media so as not to overwhelm the language learner with long lessons. Drops has both free and paid (with no ads and unlimited play time) versions. Drops offers 37 languages and has an explicit commitment to offering Indigenous and endangered languages. Ainu is the most recent Indigenous language course to be added and was developed as part of the UN's 2019 International Year of Indigenous Languages. The collaboration included community-member local translators and speakers (Farkas, 2019). It is unclear how Drops chooses community partners or approaches data sovereignty. **Indigenous languages: Ainu, ʻōlelo Hawaiʻi (Hawaiian), Gagana faʻa Sāmoa (Samoan), and te reo Māori**

DUOLINGO

<u>Duolingo</u> was established in 2011 and launched its app version in 2012. Taking a gamified approach to learning, Duolingo offers over 30 language courses. In 2018, Duolingo added its first Indigenous languages–ʻŌlelo Hawaiʻi (Hawaiian) and Diné bizaad (Navajo)–to celebrate Indigenous People's Day. The company recently released isiZulu and has plans to release additional Indigenous language courses, including te reo Māori and other African languages. Duolingo is free version with options to upgrade. While Duolingo profits from courses (in 2019, the company was valued at $1.5 billion), the company has not always paid course contributors, instead relying on a crowdsourced volunteer model. In 2021, responding to this criticism, Duolingo ended the volunteer contribution program and began to hire staff to create courses (<u>Awodey & Tsai, 2021</u>). Notably, the Indigenous language courses were created with partner organizations (for ʻŌlelo Hawaiʻi, <u>Kanaeokana</u> and <u>Kamehameha Schools</u> and for Diné bizaad, <u>San Juan School District</u>) and not through the crowdsourced model. While the Duolingo courses are free and popular, some community members have expressed concerns about the company not respecting Indigenous sovereignty and protocols (<u>Schwartz, 2020</u>). **Indigenous languages: <u>Diné bizaad (Navajo)</u>, <u>ʻŌlelo Hawaiʻi (Hawaiian)</u>, and <u>isiZulu (Zulu)</u>**

MANGO LANGUAGES

<u>Mango Languages</u> was founded in 2007 and boasts an intelligent algorithm to support language learning. It has courses for over 70 languages, including several Indigenous and less-commonly-taught languages. The company has expressed a commitment to supporting Indigenous languages. While Mango Languages charges a fee to access most of its courses, it offers its Indigenous language courses for free. Most recently, Mango Languages worked with the Pokagon Band of Potawatomi from Dowagiac, Michigan to create a course in the Potawatomi language. While the company does not have specific policies about Indigenous data sovereignty, it makes it clear to communities that it does not "own" the language and works to provide copies of all data back to partners. **Indigenous languages: <u>ᏣᎳᎩ ᎦᏬᏂᎯᏍᏗ (Cherokee language)</u>, <u>ʻŌlelo Hawaiʻi (Hawaiian)</u>, <u>Neshnabémwen (Potawatomi)</u>, <u>Tuvan</u>, and <u>more</u>**

MEMRISE

Founded in 2010, <u>Memrise</u> offers both courses created by Memrise and courses created by Memrise users. The latter are referred to as community-created courses. Of Memrise's 23 language courses for English speakers, none focus on Indigenous languages. There are, however, numerous community-created Indigenous language courses. To develop a community-created course, a user uploads their own content to Memrise. Because anyone can create a course for free on Memrise, there is little consistency in terms of the quality of courses. Memrise's <u>Terms of Use</u> raises concerns pertaining to data sovereignty, as posting content means the user grants Memrise license to the content. Further, there are no protocols in place to ensure that individual users have permission from Indigenous Nations to share language content. In some cases, courses indicate that they are created by a tribal language program, but these tend to be the exception and not the rule. **Indigenous languages: <u>Chahta Anumpa (Choctaw)</u>, <u>Neshnabémwen (Potawatomi)</u>, <u>Nʉmʉ Tekwapʉ (Comanche)</u>, <u>Ume Sami</u>, and more**

ROSETTA STONE

Founded in 1992, <u>Rosetta Stone</u> is an established CALL company offering courses in 25 commonly spoken languages. It has also created courses for several Indigenous languages in partnership with Indigenous Nations and organizations through its Endangered Language Program, established in 2004. Indigenous partners work with Rosetta Stone to create custom courses and retain sales and distribution rights. A strength of Rosetta Stone courses is their scope. For example, Chickasaw Rosetta Stone comprises four levels, each with 40 one-hour lessons, which equate to four years of language study in a classroom environment. Because they are custom products, the Indigenous language courses differ from the mainstream courses and even from each other. Rosetta Stone has taken steps to respect Indigenous partners' intellectual property rights. The main drawback of Rosetta Stone is that it is cost prohibitive for many Indigenous Nations and organizations. **Indigenous languages: Chamtéela, <u>Chikashshanompa' (Chickasaw)</u>, <u>Diné bizaad (Navajo)</u>, Inuttitut, Iñupiaq (Coastal, Kobuk/Selawik, and North Slope varieties), <u>Ojibwe</u>, Kanien'kéha (Mohawk), and Sitimaxa (Chitimacha)**

COMPARISON OF **COURSE FEATURES**

Table 1

Comparison of Course Features by Provider

	VIDEO	IMAGES	AUDIO	TEXT-BASED*	ASSESSMENT
	✓ (embedded)	✓	✓	✓	✓
cudoo By edusity	✓ (limited)	✓ (limited to graphics)	✓	✗	✓
	✗	✓ (limited to graphics)	✓	✗	✓
duolingo	✗	✓ (limited to graphics)	✓	✗	✓
MANGO	✗	✗	✓	✓	✓
MEMRiSE	✓ (embedded)	✓	✓	✗	✓
Rosetta Stone	✓	✓	✓	✓	✓

*Text-based instruction refers to the use of text (usually in English) to explain grammar and/or cultural concepts. Courses that do not have text-based instruction may still include text, such as for translations.

COURSE MAP

Figure 1

Map of Indigenous Language Courses

Figure 1 shows a map created by Courtney Tennell, Melvin Calls Him Jr., and Kari A. B. Chew of online Indigenous language courses to support language revitalization.

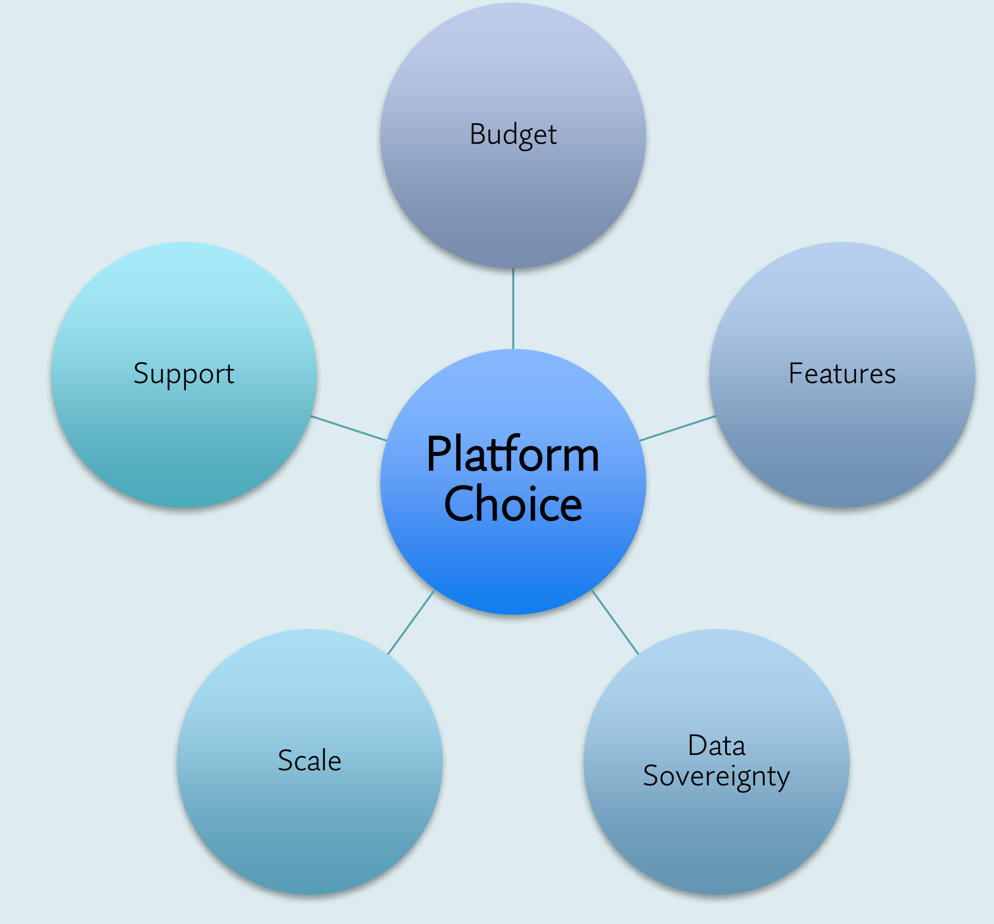
CHOOSING A **PLATFORM**

Kari A. B. Chew

After deciding to create an online Indigenous language course, Indigenous Nations and organizations will need to decide which platform to use. Spend time looking at courses and contact several technology providers. Not all technology providers are actively taking on new Indigenous language projects, so availability will factor into the decision-making process (see Figure 2). Additional considerations are cost, features, data sovereignty, the scale of the project, and the support offered by the technology provider.

Figure 2

Choosing a Platform



What is the budget? The cost for creating a course ranges from free to hundreds of thousands of dollars (and, in some cases, even more!). While free courses can be appealing, keep in mind that even "free" courses cost money to create. For example, 7000 Languages does not charge partner communities for their services, but partners often secure grants to support other work related to the course, such as creating materials and inputting language data. In contrast, some technology providers charge a great deal to create a course. While the price tag can be a drawback, the benefit is often increased support from the provider. For example, while Rosetta Stone courses are some of the most expensive to create, they are often large-scale projects involving custom solutions and extensive support from the technology provider over a multi-year period.

Which features are most important? The Comparison of Course Features chart (Table 1) can be a helpful tool for choosing the platform with the features that are most important to the community, such as audio, video, or images. For example, all the platforms we reviewed support audio but not all support video. If building lessons around immersive Indigenous language videos is a priority, Rosetta Stone may be ideal. If speech recognition that generates visuals of the waveform is important, 7000 Languages is likely the best choice. If gamified or game-based learning is desired, consider Duolingo or Drops.

How will data sovereignty be considered? The First Nations principles of OCAP® (Ownership, Control, Access, and Possession) are helpful for considering issues of data sovereignty related to course content. When negotiating agreements between Indigenous Nations or organizations and technology providers, it is important to be clear about who owns language materials and content; who controls these resources; how the Indigenous Nation or organization will access their own materials and content, especially if it needs to be transferred to the technology provider as part of the course creation process; and who will possess or have physical control of materials and content. When courses are created through partnerships between Indigenous Nations or organizations and technology providers, addressing these issues is common. Technology providers also have an interest in protecting their own proprietary technologies. Indigenous Nations and organizations should be cautious of platforms like Memrise that do not negotiate these terms and claim rights to Indigenous language content in courses.

What is the scale of the project? The scale of online Indigenous language course projects varies significantly. Some projects consist of a few lessons that take a few hours for learners to complete. Others have multiple levels with many lessons and take learners years to work through. The ideal length of the course will depend on the needs and goals of the Indigenous Nation or organization. For example, if the course is intended for use in a school setting, it will need to have an appropriate amount of content to fill the school year. In this case, Indigenous Nations or organizations may also choose to work with a technology provider that offers services to create supplemental curricula for school settings.

What support will the technology provider offer? Creating a course is a lot of work. The Indigenous Nations or organizations will require a team of people to create course content. When deciding on a technology provider, it is helpful to know what support the provider will offer. Will the technology provider assign a project lead, linguist, IT specialist, or other personnel to the project? When the course is complete, will the tech provider continue to update the course so that it does not become obsolete as technologies evolve?

RESEARCH **METHODOLOGY**

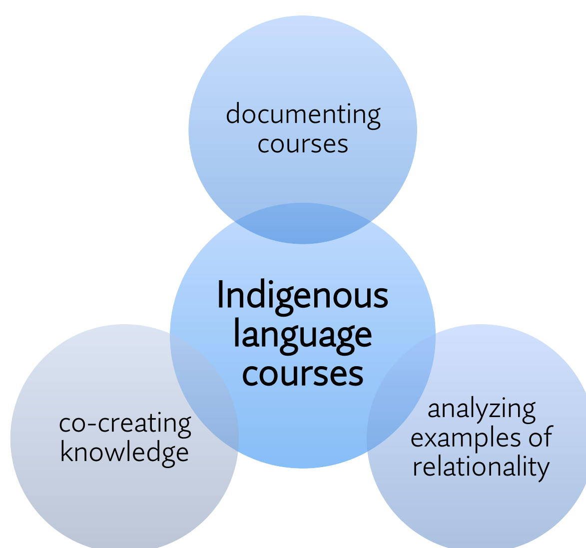
Courtney Tennell & Kari A. B. Chew

(Re)building and strengthening relationships through and to language entails processes of decolonization (Smith, 2012). It also entails reclaiming "the appropriate cultural context and sense of value that [Indigenous] language[s] would likely have always had if not for colonization" (Leonard, 2011, p. 141). Thus, a decolonizing methodology rooted in relational epistemologies is critical to creating and improving online spaces for language sharing that align with the aspirations of Indigenous communities. Our team worked to uphold the values of relationality and relational accountability through the design and goals of the project.

The research has three overarching goals: 1) documenting existing online Indigenous language courses, 2) analyzing courses for examples of centering relationality, and 3) co-creating knowledge with those who have created (or are creating) online Indigenous language courses (see Figure 3). Interrelated projects contribute to these goals. We describe the interrelated projects that contribute to these goals and inform the content of this guide in this section.

Figure 3

Goals of Project



Review of Online Indigenous Language Courses

Research team members (Chew, Tennell, and Calls Him) began by compiling a list of online Indigenous language courses. Because the team was based in Oklahoma, we began our search looking at each Nation within the state. We were interested in partnerships between popular learning technology platforms and communities, as well as efforts to teach language online using Memrise's user-created lessons, learning management systems (LMS), and sequenced YouTube videos. This initial focus allowed us to identify efforts by communities that we might have otherwise missed.

As we expanded our search, we focused on the following platforms: 7000 Languages, Cudoo, Duolingo, Drops, Mango Languages, Memrise, and Rosetta Stone. The list of courses was organized into a spreadsheet with the following information: (a) group or organization; (b) name of language; (c) platform of language; (d) link or location; (e) cost; (f) estimated time commitment or number of lessons; and (g) year created. The team identified over 100 courses, and then began reviewing selected courses (see Table 2) for examples of relationality.

Our reviews did not evaluate the courses' effectiveness or style; rather we were only looking for examples of relationality in our course review. The template guided reviewers in identifying examples of relationality in the courses in the following areas: (a) video; (b) images; (c) audio; (d) text-based instruction; (e) assessment; and (f) other features. While reviewing the courses for examples of relationality, the team also created summaries of popular platforms. These platform summaries included background information on the companies that created the platforms, Indigenous language courses on the platform, and learning technology features on the platform (e.g., audio, video, images, assessment). Platform summaries also include information about partnerships with Indigenous communities and, in some cases, concerns from community stakeholders.

Table 2

Courses Reviewed

Tech Provider	Indigenous Nation or Organization	Name of the language	Link to Course
	Sisseton Wahpeton Oyate Dakotah Language Institute	Sisseton Dakotah	Link
	Doyon Foundation	Hän	Link
	Hase' Language Revitalization Society	Kwak̓wala	Link
	Langscape	Kaqchikel	Link
	Prairies to Woodlands Indigenous Language Revitalization Circle	Southern Michif	Link
	Tlahtoltapazolli	Nahuatl	Link
cudoo By edusity	Navajo Nation	Diné bizaad (Navajo)	Link
	Māori	te reo Māori (Māori)	Link
	Saami	Saami	Link
	Ainu	Ainu	Link
	Hawaiʻi	ʻōlelo Hawaiʻi (Hawaiian)	Link
	Māori	te reo Māori (Māori)	Link
duolingo	Kanaeokana and Kamehameha Schools	ʻōlelo Hawaiʻi (Hawaiian)	Link
	San Juan School District, Utah	Diné bizaad (Navajo)	Link
MANGO	Cherokee Nation & Tulsa Public Libraries	ᏣᎳᎩ ᎦᏬᏂᎯᏍᏗ (Cherokee)	Link
	Hawaiʻi (individual speakers)	ʻōlelo Hawaiʻi (Hawaiian)	Link
	Pokagon Band of Potawatomi	Neshnabémwen (Potawatomi)	Link
MEMRISE	Comanche Nation of Oklahoma	Nʉmʉ Tekwapʉ̲ (Comanche)	Link
	Citizen Potawatomi Nation	Neshnabémwen (Potawatomi)	Link
	Mississippi Band of Choctaw Indians	Chahta Anumpa (Choctaw)	Link
Rosetta Stone	Chickasaw Nation	Chikashshanompa' (Chickasaw)	Link
	Mille Lacs Band of Ojibwe	Ojibwe	Link
	Navajo Renaissance	Diné bizaad (Navajo)	Link

Interviews

An additional component of this research was a series of nine one-hour interviews with 12 course developers (see Table 3), including language program directors, teachers, scholars, and students, from Indigenous Nations and organizations. Interviews are an important component of this research because language revitalization work is "a lived experience of an oral society, therefore, accessible primarily through the oral narratives of the people themselves" (Nicholas, 2008, p. 64). These interviews allowed the research team to gain insight that was not possible from the course reviews alone. The team identified the course developers from the table of online Indigenous language courses, from credits on courses, and from press releases and news articles about courses. Some of these interviews were group interviews and included the team that developed the course. Interview questions were organized around the themes of background and initial involvement, course creation, and reflection on the experience.

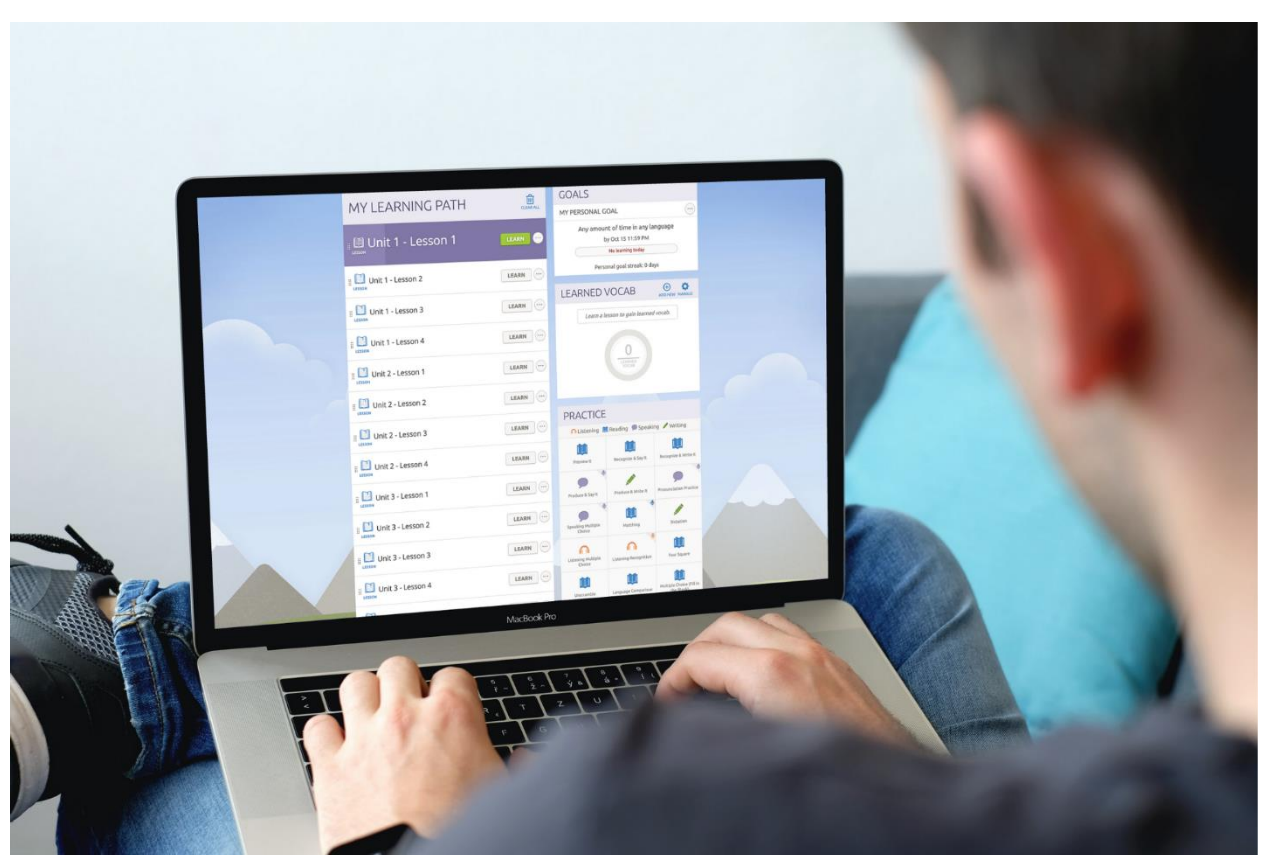
Gathering

A community-focused component of this project was a two-day virtual gathering called Learning in Relation: Creating Online Indigenous Language Courses (read more here). The goal of this gathering was to share the work that online course creators have accomplished and to build relationships with other people who are doing language revitalization work. To do this, the team hosted a public event and a smaller, invited event. The public event was a webinar that featured a panel of Indigenous language advocates who discussed creating online courses that centered Indigenous ways of knowing and being. The invited component of the gathering centered on relational epistemologies and brought together Indigenous language advocates to participate in facilitated discussions about relationality in online courses, benefits, challenges, hopes for courses, and shared advice for communities that wanted to create their own courses.

Table 3

Interviews

#	Name(s)	Course/Project	Affiliation
1	Makana & Manuwai	Duolingo Hawaiian	Kamehameha Schools
2	Justin	Potawatomi Memrise & LMS	Citizen Potawatomi Nation
3	Emily (pseudonym)	Duolingo Navajo	university student
4	Anton	Rosetta Stone Ojibwe	Bemidji State University
5	Allan	Alaska Native language courses with 7000 Languages	Doyon Foundation
6	Rhonda, Carla, & Kyle	Mango Languages Potawatomi	Pokagon Band of Potawatomi
7	Kate	Memrise Comanche	Comanche Nation
8	Roy	Mango Languages Cherokee	Cherokee Nation
9	language teacher	Osage LMS & other projects	Osage Nation



Images: Kwak̓wala 7000 Languages on Laptop Screen (top), Chickasaw Rosetta Stone on Laptop Screen (bottom)

RELATIONALITY IN COURSES

The following sections share examples of how Indigenous language courses enacted relationality using various course features, including:

AUDIO

IMAGES

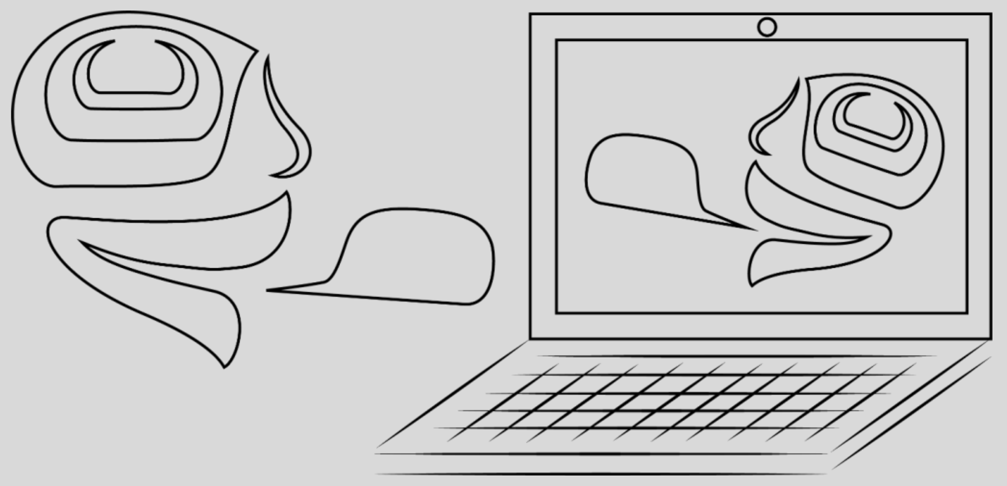
VIDEO

TEXT-BASED INSTRUCTION

ASSESSMENT

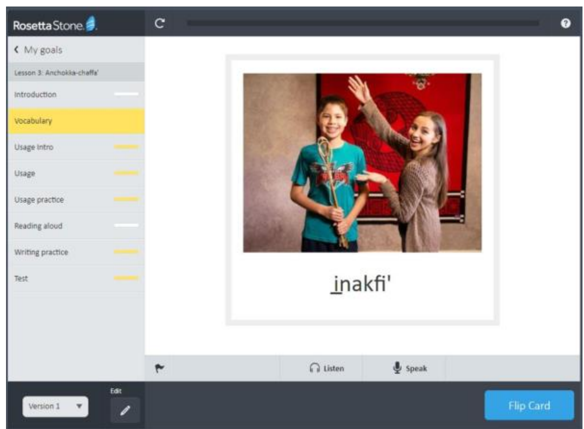
ORTHOGRAPHY AND DIALECT

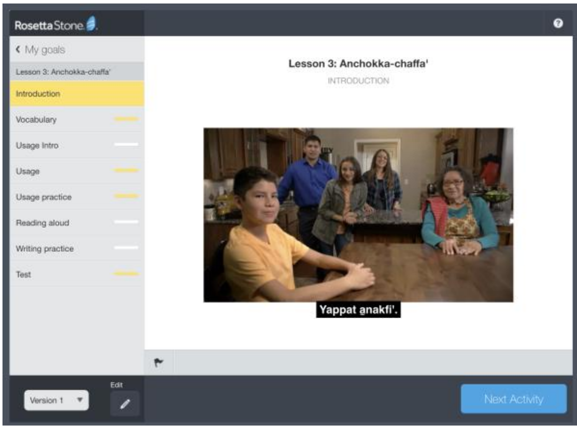
OTHER NOTABLE FEATURES

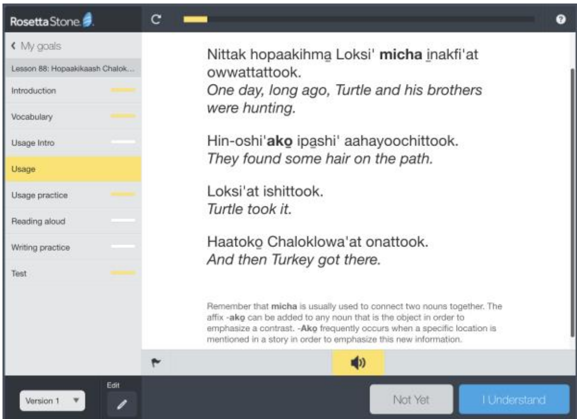


AUDIO

Kari A. B. Chew







Images: Chickasaw Rosetta Stone

From the first wax cylinder recordings in the 1890s to records, tapes, CDs, and now digital recordings (Galla, 2018a), technology to support audio-based learning and teaching has evolved significantly over time. All the CALL platforms we looked at use audio features. CALL courses typically include, at minimum, audio recordings of key examples and vocabulary words, but many also include other features like read-along and pronunciation feedback. For this reason, the creation of audio materials is a major part of the work to create an Indigenous language CALL course. At the same time, creating audio is not always easy in ILR contexts. As the Chickasaw Rosetta Stone course developers reflected, creating audio materials for the course "required a great deal of work 'behind the scenes,' as each audio segment was created through a collaborative process" with speakers, most of whom were Elders (Chew et al., 2022, p. 247). This section offers some examples and advice about how Indigenous Nations and organizations center relationality in audio components of courses.

Complete Sentences in Culturally Relevant Contexts

Recordings of individual vocabulary words are important for language learners, but also critical are recordings of the words used in complete sentences and in a variety of culturally relevant contexts. In Chickasaw Rosetta Stone, the word inakfi' (brother) is introduced as a vocabulary word in Lesson 3, a lesson focused on kinship terms. In other parts of this lesson, the term is used in complete sentences like Yappat anakfi'. (This is my brother.). This lesson teaches learners about how noun affixes are used to express relationships and how different types of relationships are understood through the historic clan system. In Lesson 88, the term inakfi' is revisited to tell a shikonno'pa' (traditional story) about why turkey chest feathers look the way they do. By using the term repeatedly and in different contexts throughout Chickasaw Rosetta Stone, learners become prepared to use the term in different genres of speech, from everyday conversation to storytelling.

Recordings of Conversations

Beyond vocabulary words and sentences, it is also helpful to share recordings of conversations between speakers. Listen-and-repeat approaches that tend to promote mimicry of language can inadvertently send the message that there is only one "correct" way to speak, and modeling conversations helps to shift away from this tendency (Wagner, 2017, p. 140). Conversations are an opportunity to teach things like how to ask and answer questions, take turns talking, express interest in or disagreement with what someone is saying, joke or tease, and more. These skills help learners to build and strengthen relationships with other people. Many of the Indigenous language CALL courses we reviewed built lessons around scripted conversations. Modeling how to have a conversation in the language is critical to preparing learners to use what they are learning in their communities with other people. Notably, conversations can be shared not only through audio, but also video.

Most often conversations in online courses are scripted. For example, the Cherokee Mango Languages course includes audio of conversations between two speakers, Cherokee National Treasures and first language speakers John Ross and Anna Sixkiller. They have a conversation in Cherokee using words and phrases from the lesson. At the end of the lesson, the conversation is replayed, with the idea that the learner can understand it better.

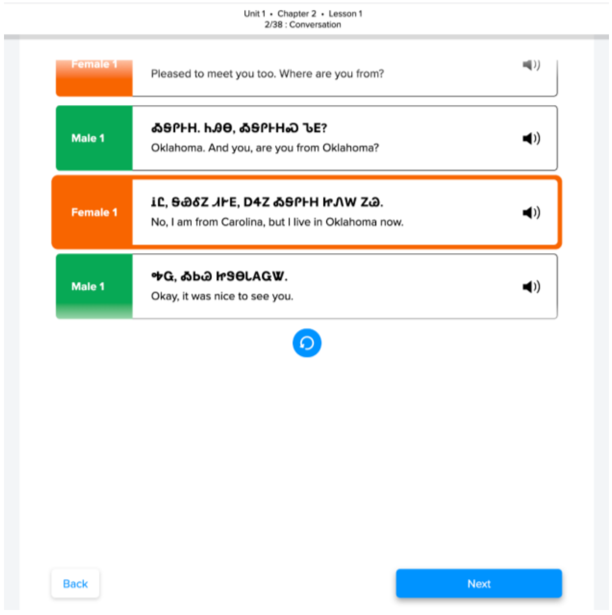


Image: Cherokee Mango Languages

One drawback of including scripted conversations is that they can be almost *too perfect*. When speech is scripted and recorded, learners benefit from having clear examples but, at the same time, may not get to hear what it sounds like to take turns, pause, or joke in everyday conversations. Some course creators reflected that they would like to include more examples of unscripted conversations. As the Language Revitalization Program Director for the Doyon Foundation stated in an interview for this research, "If you want to capture the way people speak, it's not always grammatically prescribed. People express themselves many ways in the language. Some of them could be for cultural reasons. … It may be something we can do in the future, where you just take two very fluent speakers and just have them sit and talk. Then whatever they say becomes the lessons."

Another opportunity to enact relational epistemologies in online courses is to teach learners how to interact with other-than-human relations, such as the lands, waters, plants, animals, and other beings. Several courses included examples of prayer and interactions with other-than-human relations, while also being mindful of protecting cultural knowledge and types of communication that may not be appropriate to share. Some courses also included stories in which other-than-human beings interact in the language with each other.

Audio From Diverse Speakers

Include audio from many speakers, including those of different ages, proficiencies, and genders and from different regions. Language learners benefit from hearing a diversity of speakers. Some Indigenous language courses include the voices of other learners, in addition to the voices of first language speakers. Because first language speakers are often Elders, this approach can also help to address language ideologies about speakerhood and age. Research shows that sometimes when younger generations only hear Elder speakers, they view the language as something "you start speaking… as you get older" (Meek, 2007, p. 34). By hearing younger speakers of varying proficiencies, those using the CALL course can begin to envision themselves and their generations speaking the language regularly. Including the voices of language learners is a way of honoring these speakers as having a key role in carrying the language forward.

Many courses included representation of both men and women speakers. While representation of speakers of different genders is positive, we found that some platforms also required learners to identify themselves in terms of a binary based on biological sex (either male or female), usually to use voice recognition features. This aspect of the platform typically cannot be modified by Indigenous course creators. When CALL technologies perpetuate these binaries, it can exclude community members who may hold other gender identities. This imposed binary is harmful to trans, non-binary, and Two-Spirit language learners and is at odds with relational epistemologies of many Indigenous Nations (Laing, 2021).

If the goal of the online course is to support language teaching across regions and dialects, course creators may choose to include speakers of multiple varieties of the language. The Kwak̓wala 7000 Languages course creators were intentional in including speakers from different Kwakwa̱ka̱'wakw communities. As stated in the course description, this approach values dialectal difference to affirm Kwakwa̱ka̱'wakw identity. Each Indigenous Nation has unique needs for ILR, so this approach may not work for every situation. Some Indigenous language courses focus on just one variety (or dialect) of a language (for more about dialect, see the section Orthography and Dialect). For example, Ojibwe Rosetta Stone was created specifically for the "long-term support of the Mille Lacs Band of Ojibwe to retain our unique identity, language (dialect) stories, and sovereignty" (Aanjibimaadizing, 2021).

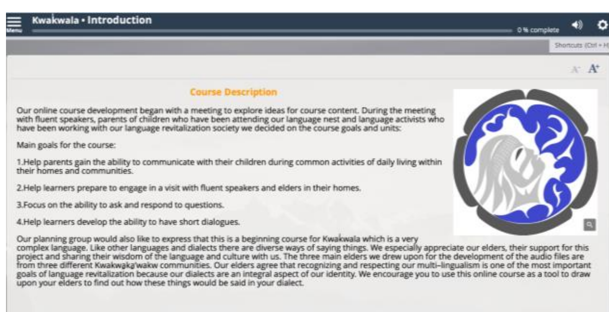


Image: Kwak̓wala 7000 Languages

Historic Audio Recordings

Usually, Indigenous language course creators record audio specifically for the online course, but it is also possible to use high-quality historic audio recordings. Using such recordings is a process that requires care. In the field of language revitalization, there is a difficult history of non-Indigenous linguists making language recordings without consent from speakers and families and without respect for the sovereignty of Indigenous Nations. It is necessary to follow cultural protocols and work with living relatives of speakers to ensure that use of historic recordings is appropriate and honors the wishes of those who have passed on.

Video: Isaac Juneby: The Legacy Lives On

The Hän 7000 Languages course, created in partnership with the Doyon Foundation in 2019, is an example of the exceptional use of historic audio to honor the legacy of an Elder language teacher. The course is based on 1994 recorded conversation lessons made by the late fluent speaker Isaac Juneby. The course is supported by Juneby's family, including his wife Sandra Juneby, who said, "I hope that Isaac's Hän language legacy embodied in these lessons will be enjoyed by all those interested in learning to speak and understand the ancestral language of the Hän Gwich'in of Eagle Village, Alaska" (Doyon Foundation, 2019).

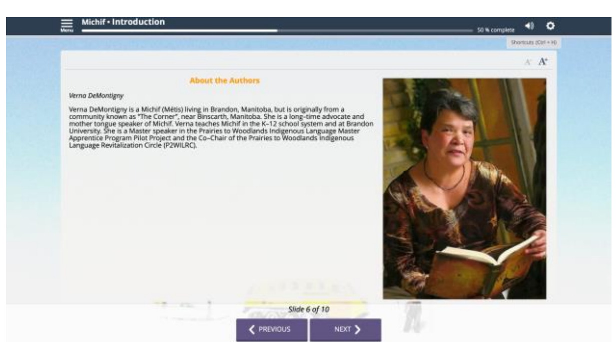
Even when creating new audio for a course, it is important to consider the recordings part of a historic record for the community. In some cases, Elder speakers may pass on during or after the creation of an online course. The recordings they created for the course, with consent, provide opportunities for present and future language learners to continue to be in relation to these revered teachers. When speakers passed away during the creation of Chickasaw Rosetta Stone, course creators reflected, "It is a powerful experience to be able to still practice with these teachers who gave us so much" (Chew et al., 2022, p. 248).

Information About the Speakers

One of the most critical yet overlooked ways to enact relational epistemologies in audio components of a CALL course is to include information about the people whose

voices are heard in the course. In our review of courses, we found that most included audio without ever identifying speakers. One reason for this lack of identification is that the CALL platforms did not have designated places in courses for the purpose of crediting contributors. This absence of credit to contributors is a concern especially in ILR contexts because the "disembodiment of language from speakers reifies language as [an] object" that can be separated from the people who speak it (Perley, 2012, p. 134), a concept deeply at odds with relational epistemologies. CALL platforms could better support Indigenous ways of knowing and being by creating features for crediting and sharing information about contributors. In courses that did include information about speakers, course creators typically re-purposed an existing course feature, such as a text-based activity, to share credits and/or speaker biographies.

In the Michif 7000 Languages course, course creators included biographies and photographs of all contributors. The Potawatomi Mango Languages course, created by the Pokagon Band of Potawatomi, used a Culture Note to briefly introduce the speakers and course creators at the end of their course. Notably, in some cases tech providers included information about speakers and course contributors in blogs hosted on their websites and in press releases, but not in the courses themselves.



Images: Michif 7000 Languages

Culture Note

Bozho, Carla Collins nde zhnëkas. You have probably become familiar with my voice. I've been the voice for the female Bodwéwadmimwen lines and have voiced most of the female reading, listening and conversation passages. I've also read the culture notes for chapters 5-10. Kyle Malott is the other voice you probably know well. He has read the male Bodwéwadmimwen lines and has voiced most of the male reading, listening and conversation passages. Rhonda Purcell read the culture notes for chapters 1-4 as well as lent her voice to one of our Bodwéwadmimwen passages.

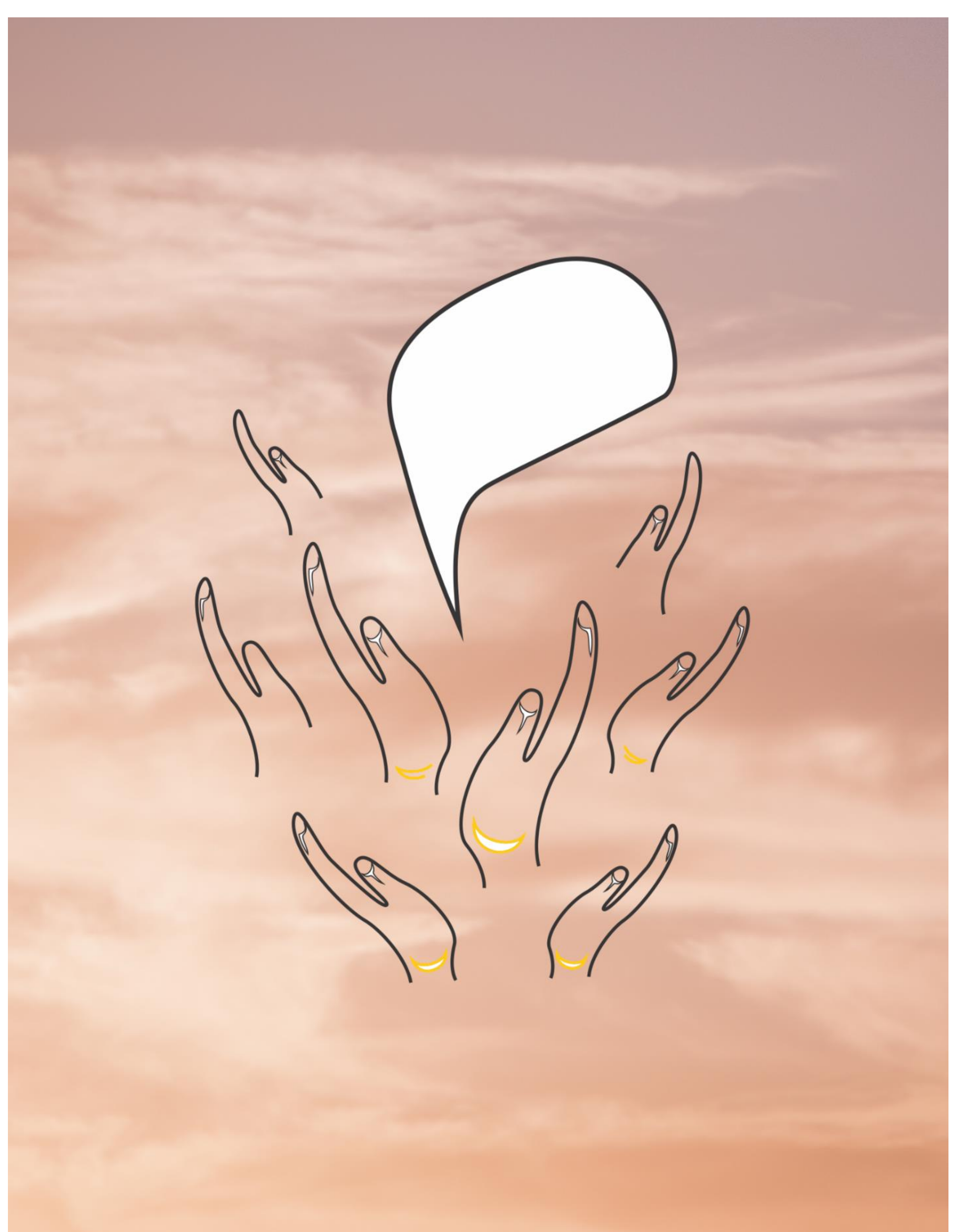
Image: Potawatomi Mango Languages

Supporting Present and Future Learners

Audio materials have great benefits to language learners now and into the future. For one, audio recordings can reduce learner anxieties about asking teachers and Elders how to say something or practicing speaking in a group setting. With audio recordings, learners can listen as many times as they want without feeling like they are straining relationships with teachers or Elder speakers by repeatedly asking for information. Recordings also support learners in situations where there are no remaining speakers or the learners do not have access to teachers and speakers in-person. Learners can practice repeating after speakers without feeling pressure that they are *not saying it right*. As Galla (2016) says, "technology is empowering in that the tool never judges" (p. 1146).

Practicing with audio through CALL courses is linked to pronunciation improvements (Bajorek, 2017). In an interview for our research, the creators of Potawatomi Mango Languages described observing improvements in learners' pronunciation: "Mango gives students independent learning time, where they can exercise their flaws, and they can move through that really uncomfortable beginning learner phase of not sounding like your instructor. That's huge… [The language teachers] can attest that [the students'] sound on the first day of virtual class was so great. So great. And how did they get that? They themselves said it is because they were already utilizing Mango. Whereas, before, it would be a struggle to get students to participate in verbal exercises because they knew they were going to be so far off." Additionally, when courses are used in other settings, such as community or school classes, they can help teachers who are beginning language learners. Teachers can rely on audio to model language rather than having to be the model speaker themselves.

Audio materials can be used for many purposes beyond the CALL course. For this reason, it is important to consider not only relational approaches to creating and using audio materials but also issues of data sovereignty. Indigenous Nations and organizations must ensure they retain rights to the recordings and that the technology provider does not become "owner" of recordings created for the course. For tips and considerations, see the First Peoples' Cultural Council's (2020) *Check before you tech* guide.



IMAGES

Courtney Tennell

Nearly all the courses we reviewed had images to visually represent the terms or ideas taught. Communities use photographs, artwork, clip art, and other graphics in their online Indigenous language courses to build relationships with learners and help learners create connections to the language they are learning.

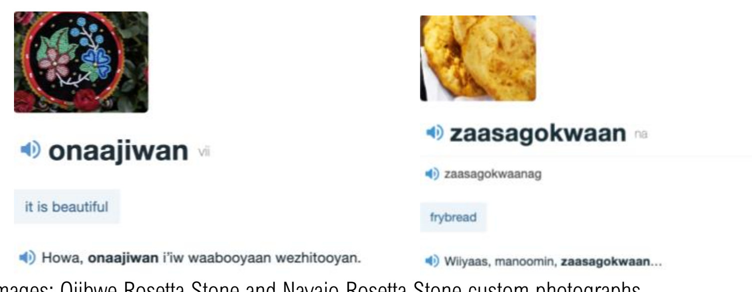
Photographs

When creating language courses, communities must choose whether to use stock images or custom images. Stock images are existing pictures found through companies like Getty and Shutterstock. Custom images are created by the community specifically for their language course using a digital camera and photo editing software like Adobe or Pixlr. Communities and organizations can also hire a photographer or collaborate with their communication or marketing departments to create these images.

While custom images are an important way to enact relationality in a course, the number of images needed for a course can be overwhelming. The Chickasaw Rosetta Stone team noted that there were over 1,400 unique vocabulary terms in their course, each requiring its own image (Chew et al., 2022). The work to create this number of custom images can be a barrier to some communities. The team was able to use both types of images by creating custom images for terms related to ancestral foods, cultural items and practices, and specific places significant to the community while locating stock images for more common terms such as "cat" or "apple" (Chew et al., 2022).

Other communities who partnered with Rosetta Stone were also able to use custom images to represent terms. The Rosetta Stone Ojibwe and Navajo courses both created custom images featuring community members and cultural items and practices.

Images: Chickasaw Rosetta Stone custom photographs



Images: Ojibwe Rosetta Stone and Navajo Rosetta Stone custom photographs

Branded Images

Some platforms like Duolingo, Cudoo, and Drops use branded art for images. With these platforms, communities do not face the custom/stock images dilemma; however, it can be difficult to enact relationality using generic places and ethnically ambiguous cartoonish images of people. Still, communities who have partnered with these platforms shared with us how they worked within the company's brand guidelines for artwork to produce culturally relevant images. The Duolingo ʻōlelo Hawaiʻi team collaborated with a local artist to create images that used Duolingo's color palette and art style. The resulting images enact relationality by giving ʻōlelo Hawaiʻi learners who are based in the community a visual representation of familiar foods. This collaborative effort is an example of decolonizing praxis and centering relationality not easily recognized without knowing the stories behind the course. ʻōlelo Hawaiʻi course creators made decisions together about which plant relations were important to include and how they would be represented. These choices prioritize vocabulary relevant to community members over vocabulary related to travel and tourism, which is common in dominant language CALL courses.

Images: Duolingo Hawaiian branded artwork

Clip Art

Another option for images when creating an online language course is to use clip art. Clip art is usually simple illustrations or graphics. Like stock photo images, clip art can be found in online libraries or created in collaboration with a graphic designer or artist, giving the community stock and custom options. The Comanche Nation used The Noun Project (https://thenounproject.com), an online collection of 3 million+ icons. These icons are free to use under a Creative Commons license, giving credit to the creator of the artwork. Course developers can also partner with a community-based graphic designer or artist, which gives them more control over the illustrations. Having control over the illustrations can help to ensure that depictions of cultural items and people are done in a way that is respectful.

Image: Comanche Nation Memrise

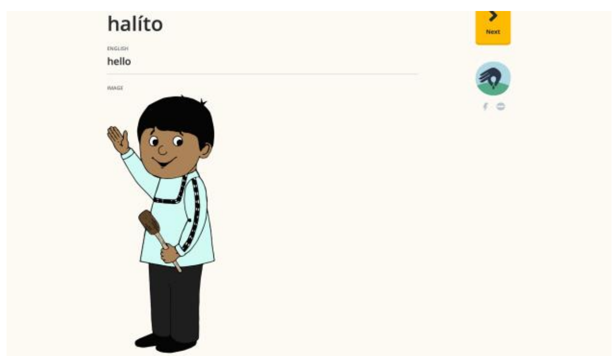


Image: Choctaw Memrise

Community Created Artwork

Using custom artwork by community members ensures that the images in the course reflect the community's values and traditions. This type of artwork appears in both the Ojibwe and Chickasaw Rosetta Stone courses. One example in the Ojibwe course is an image for the vocabulary word Manidoo (spirit). In this case, the word's meaning is specific to the community, and it would not be possible to find stock images to capture this meaning. While communities can collaborate with a professional artist or graphic designer to bring their visions to life, another interesting option is to allow youth participating in language programs to create art, which builds relationships between past and current learners. The Chickasaw course features youth artwork in several lessons.

Image: Ojibwe Rosetta Stone artwork (Manidoo)

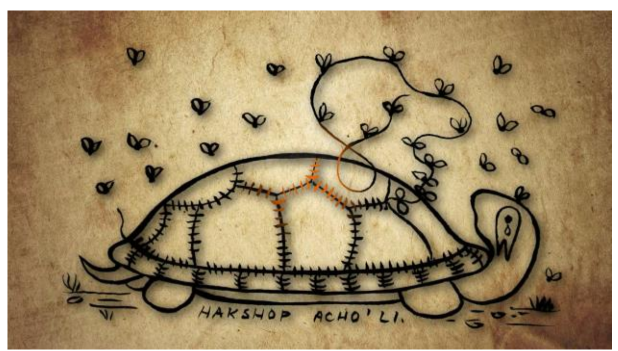
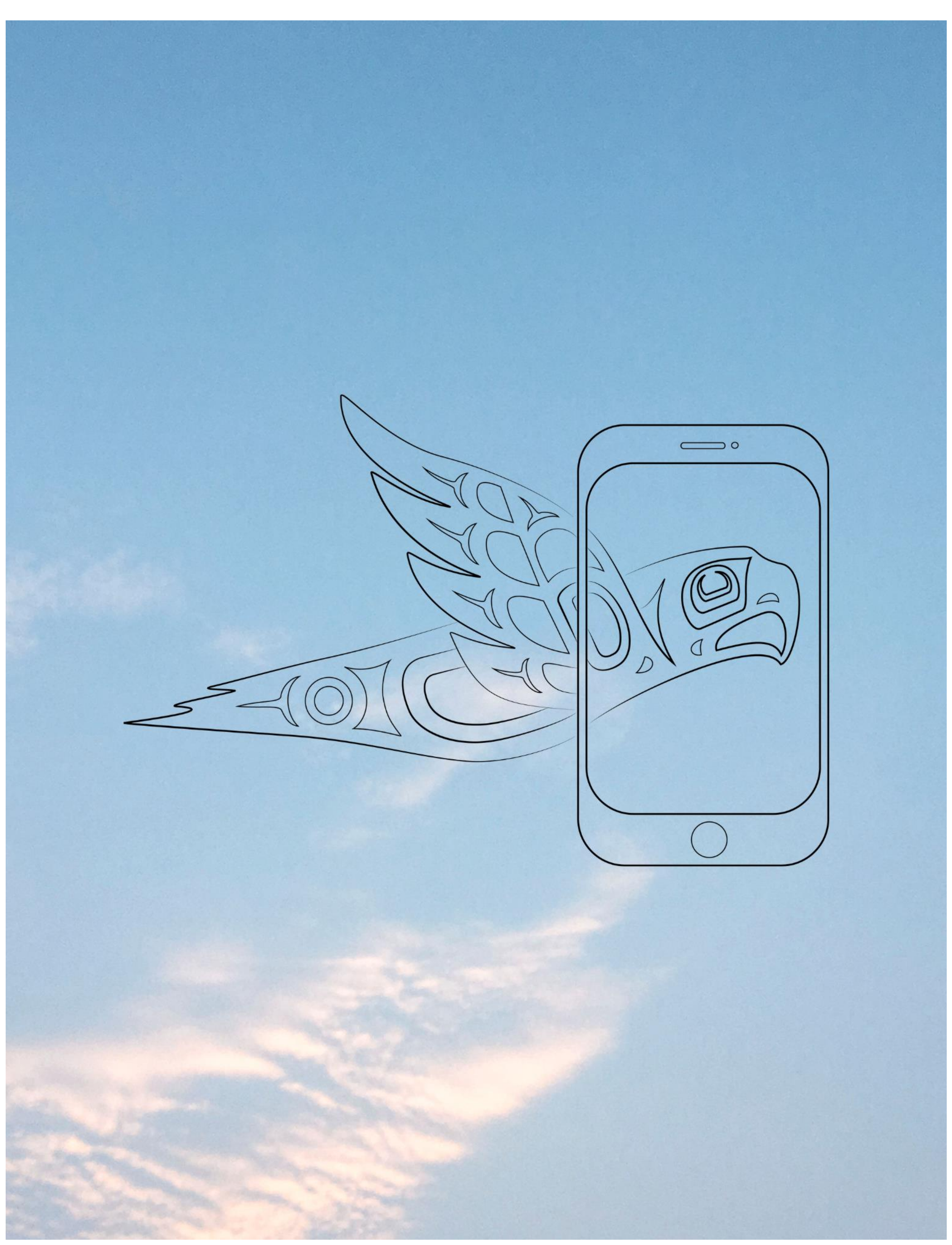


Image: Chickasaw Rosetta Stone artwork (Hopaakikaash Loksi' hakshopat boshollittook by Lokosh)

Image: Chickasaw Rosetta Stone artwork (Hopaakikaash Shokha' Chaklhihili' itiat shiipattook by Lauren John)

Evolving Use of Images

New innovations in technology create expanded possibilities for the use of images in CALL. For example, 7000 Languages recently unveiled interactive 360° panorama images as a new feature on the Transparent Language platform (Witkowski & Jeannette, 2022), which allows learners to interact with language and images simultaneously. This feature creates new possibilities for bringing land-based learning into virtual spaces. Similarly, the Osage Cultural Trunks program uses virtual reality (VR) to help citizens outside of the reservation build a relationship to the land. As an Osage Nation language teacher explained, "We're creating the actual visual for them of their reservation, you know, in a May type of a day. And so, we're really, really thinking about … all of our constituency, and how to connect them and get them where they feel like they're part of the tribe and not like outsiders." The Osage Nation is also using VR to create fully immersive, virtual classrooms so that when learners put on their VR headset and connect, it will be as if they are in a language classroom with other learners and the language teacher. While VR has not been fully integrated into online Indigenous language courses at this point, this integration will likely happen soon.



VIDEO

Kari A. B. Chew

Video is a useful tool for learning and teaching Indigenous languages online, yet not all CALL platforms use video. Some platforms, like 7000 Languages and Memrise, support the use of embedded videos to complement lesson content. Of the platforms and courses we reviewed, the Rosetta Stone Chickasaw and Ojibwe courses were the only ones to build lessons primarily around video content. (All Chickasaw videos are freely available to view here.) The principles that apply to enacting relationality in audio also apply to video. Video presents further opportunities for learners to see non-verbal aspects of communication such as gestures, body language, and more. Both courses provide strong examples of centering relationality in videos.

Image: Ojibwe Rosetta Stone Family. From left: Shirley Amikogaabawiikwe Boyd, Byron Niigaanigwaneb Ninham, Ava Madwewebineshiinh Pettibone, Preston Manidoobineshiinsag Sullivan, William Gidagigwaneb Premo and Hannah Niigaanibinesiikwe Orie. Rosetta Stone.

Video: Mille Lacs Band of Ojibwe Partners with Rosetta Stone

In both the Chickasaw and Ojibwe courses, each lesson begins with a scripted and professionally produced immersive short video that introduces the lesson theme along with key vocabulary and grammar. The videos revolve around an intergenerational Indigenous family doing activities together in their home and in their Nation. All actors are community members, with varying proficiencies in and experiences with the language, and include Elders, adults, and youth. Including community members is important to getting the community excited about the course. As a creator for the Ojibwe course explained, it "makes a difference when people see their grandkids" in videos. Further, when learners see real people in immersive videos, some of whom they may know, they can begin to envision situations where the language is spoken all the time.

Image: Chickasaw Rosetta Stone Family. From left: Nevaeh Smith, Jariah Eyachabbe, Jason Eyachabbe), Luther John, Rose Shields-Jefferson, and Kara Berst. Rosetta Stone.

Video: Behind the Scenes Rosetta Stone Chickasaw

Highlight Culturally Significant Activities

As with audio, videos are especially helpful learning tools when they share complete sentences and conversations in culturally relevant contexts. In both courses, videos highlight culturally significant activities like gathering and preparing traditional foods, hunting, community feasts or meals, kinship relationships, regalia, and prayer. For example, in Chickasaw Rosetta Stone, a series of videos follow the family through the process of gathering, cleaning, cooking, and eating ato̲falla' imilhlha' (wild onions).

Similarly, an Ojibwe Rosetta Stone video shows the family gathering and preparing manoomin (wild rice) by knocking it into their canoe, parching it over a fire, threshing it by stepping on it, and then winnowing it to remove hulls. These videos emphasize relationships between people, land, food, water, and spirits.

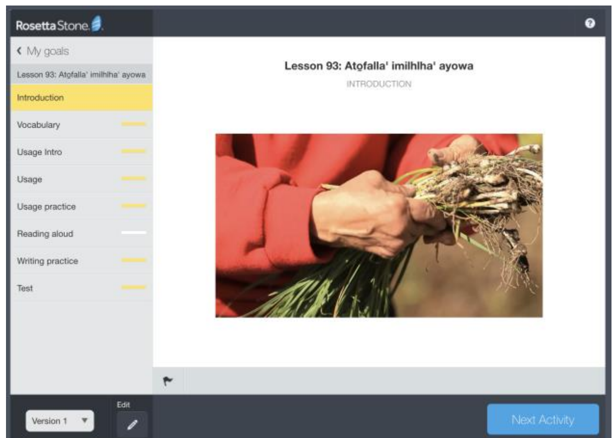


Image: Chickasaw Rosetta Stone

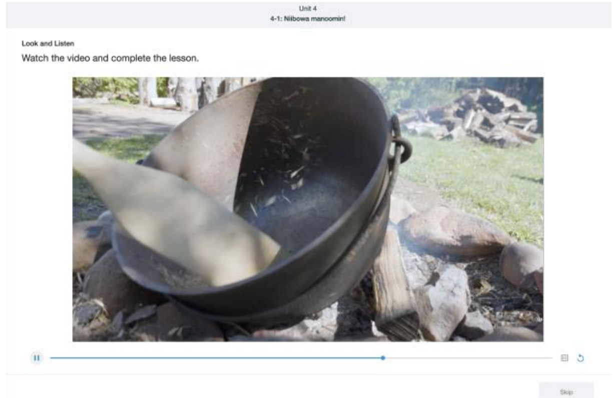


Image: Ojibwe Rosetta Stone

Draw on Community Stories and Narratives

Creating video content can be an intensive process with a steep learning curve. The Chickasaw Rosetta Stone course creators met after completing Level 1 (consisting of 40 lessons) of the course to reflect on the experience and what would come next (Chew et al., 2022). In the next levels of the course, they began to focus on narratives shared by Elder speakers. These narratives included shikonno'pa' (traditional stories), as well as personal, family, and community stories and histories–including stories of language loss and revitalization (Chew et al., 2022). For example, one video shares the story of how a convening of animals agreed to divide day from night. Another video, based on the real experiences of actor Rose Shields-Jefferson, depicts the grandmother recounting her experiences attending Haskell and speaking both Chikashshanompa' and English (Chew et al., 2022). This video content proved an effective approach to teaching Chickasaw values and centering Chickasaw epistemologies in the course, while also addressing the realities of the ILR context.

Importantly, videos do not need to be professionally produced to be effective for language learning. Hermes et al. (2012) created video content for an Ojibwe course through week-long community movie camps, in which groups worked together to create semi-scripted (but also spontaneous!) short videos. Video creation became a language learning activity in and of itself, and the content was also used in the software. Relatedly, Schwab-Cartas (2018) describes using *cellphilm*, a DIY approach to making videos on mobile technologies that are already available in communities, to bring together youth and Elders to support Zapotec reclamation. In many ways, a community-involved approach to video creation offers important opportunities to enact relationality off-screen.

Image: DIY cellphone video

TEXT-BASED **INSTRUCTION**

Kari A. B. Chew

Text-based instruction refers to the use of text in English or another language the learner already knows to explain grammar and/or cultural concepts. 7000 Languages, Mango Languages, and Rosetta Stone Indigenous language courses include text-based instruction. Other courses may still include text, such as for translations, but not for instruction. While immersion is often considered an ideal way to teach language, research shows that, for adult Indigenous language learners, direct grammatical instruction alongside immersion is "effective for both language acquisition and for the transmission of history, language, and cultural values across generations" (Rosborough et al., 2017, p. 430). Several of the courses we reviewed exemplify relational approaches to teaching grammar and culture through text.

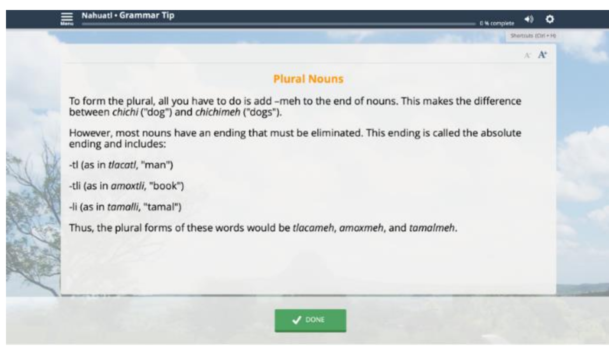


Image: Nahuatl 7000 Languages

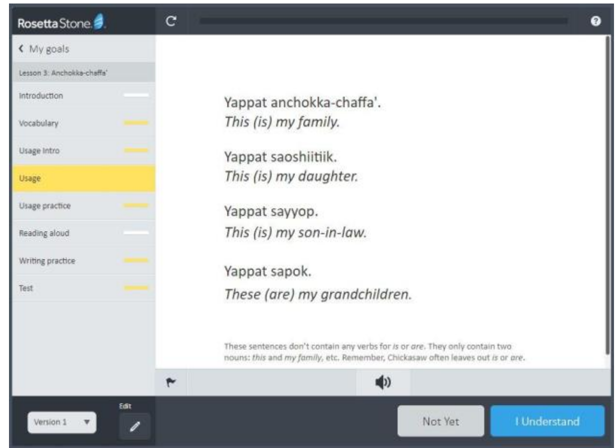


Image: Chickasaw Rosetta Stone

Grammar Explanations

Many Indigenous languages have complex grammatical structures. Helping learners to understand these structures in an asynchronous learning environment is challenging. Course creators must anticipate learners' questions and answer them within the course. In interviews, several course creators said that they felt explaining grammatical concepts in English was necessary to support learners. Some courses include screens that are only text, such as in the Grammar Tip cards in 7000 Languages courses. Other courses pair audio examples with explanation text, such as in the Chickasaw Rosetta Stone Usage cards.

Grammatical explanations can help teach polysynthetic languages, in which words are composed of morphemes. For example, on the Chickasaw Rosetta Stone Usage card above, the English four-word sentence "This is my daughter," is expressed in two words in Chickasaw: "Yappat saoshitiik." The noun affixes sa- ("my") and tiik (female) attach to oshi' ("one's child") to express "my daughter." Rosborough et al. (2017) explain of Kwak̓wala that strong speakers and linguists may understand the "literal meanings expressed through morpheme rich-words," but learners often do not because English translations alone do not convey these deeper meanings (p. 432). Teaching morphemes and offering direct grammatical instruction allows "for deeper engagement with cultural concepts and an appreciation for the beauty of Kwak̓wala [and other Indigenous language] words" (p. 432). Chickasaw Rosetta Stone lessons, for example, go on to explain that it is impossible to talk about a daughter without specifying a relationship to someone else. Further, the affix which expresses "my" also expresses relationships through the matrilineal clan system.

Indigenous language courses prioritized practical and culturally relevant examples. In the below examples, the Potawatomi Mango Languages course teaches language about clan relationships using color-coding. This color-coding helps learners to understand how Potawatomi morphemes correlate to English words. This card along

with a Grammar Note teach that clans are beings to which Potawatomi people are related.

Who is your clan?

Wénithë o gdodém?

Grammar Note

When talking about our clans we refer to them as beings. Therefore, if we want to say that we don't know our clan, we would say "I don't know him/her," ttho ngëkénmasi. Did you remember that we use both ttho and -si to make a negative simple statement?

Images: Potawatomi Mango Languages

While relationality can be enacted in text-based instruction, there are also challenges. When creating an asynchronous course, course creators may find it difficult to envision and have a sense of relationship to the learners who will eventually use the course. Some course creators found it helpful to keep a specific person in mind when working on the course. Similarly, learners may not see themselves as in relation to the course creators. Content in text-based instruction may seem disembodied, as though the source of the content is a computer and not people. Course creators expressed tensions about presenting grammar lessons in written form. There is naturally a lot of variation in language, and courses typically require more simplified explanations that may not account for all possible ways to say something. Learners may perceive the course content as being correct and other variations as incorrect. This places pressure on course creators and undermines relational epistemologies in which knowledge is held collectively and not by a small group of *experts*.

Culture Notes

In addition to sharing information about grammar usage, several courses also included cultural information and teachings as written text. In Mango Languages, these teachings took the form of designated Culture. Culture Notes serve to connect the language to culture in ways that may not be possible in other sections of the course. Other courses, such as the Rosetta Stone courses, included cultural notes, though there were not spaces specifically designated for this purpose as in the Mango Languages courses.

Culture Note

The true meaning of the word aloha is "love," and it is used to express affection among everyone present upon meeting and upon departing. The question Pehea ʻoe? is a normal, contemporary question, but it is a result of modern Western influence. In traditional Hawaiian culture of old, a more common greeting would have been an invitation to come eat or asking where the person is going.

Image: Hawaiian Mango Languages

The Chickasaw Rosetta Stone creators reflected that they were more able to enact relational epistemologies in their course when cultural content was not restricted to a particular place in the course (Chew et al., 2022). They explained that when creating the first two levels of the course, they used "Cultural Cards." Rosetta Stone suggested these two additional cards be added at the end of each Usage section to provide supplemental cultural information connected to the lesson topic. Finding that it was "not ideal to separate cultural teachings from grammatical instruction," the course creators "worked more deliberately to integrate cultural teachings with grammar instruction" in the next levels (Chew et al., 2022, p. 251). They explain their revised approach using a specific lesson as an example:

> Lesson 95 of Level 3 tells a shikonno'pa' about a time when Chokfi' (Rabbit) had a long tail and how they lost it. In this lesson, grammatical instruction is woven together with cultural teachings and explanations across all cards. For example, the card shown in Image 13 presents example sentences from the story. Explanatory text at the bottom of the card teaches learners about how to talk about quoted speech and links this instruction to important teachings that tell of a time when animals spoke to each other and to Chikasha okla. (Chew et al., 2022, p. 251)

This approach proved successful as it pushed creators to collaborate more on course content and helped to make learning more engaging.

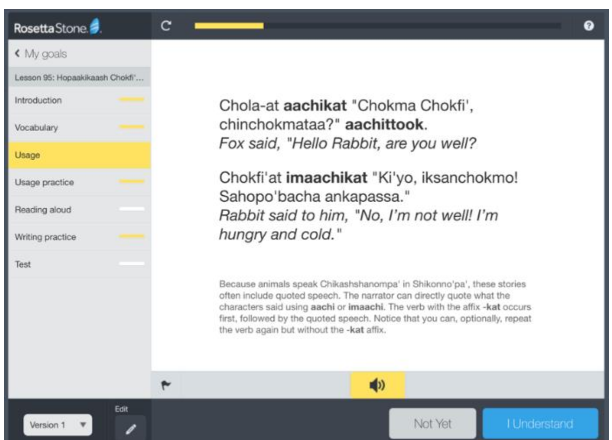


Image: Chickasaw Rosetta Stone

The Ojibwe Rosetta Stone course creators integrated cultural practice throughout all lessons and used shorter modules to provide additional information about the culture in English. For example, teachings about tobacco are present across lessons. Weaving cultural knowledge throughout all aspects of the course was important. A course creator explained, "We had some pretty strong-willed Elders who are very insistent about having Anishinaabe-inendamowin—a Native frame of reference for everything that we're doing… It didn't feel like we had to fight about that, but we did have to give it a lot of thought." Decisions included what cultural knowledge to share or omit. The course creator further stated, "Some things don't belong in a publicly… shareable source, so we didn't do a unit on how to do a traditional Ojibwe funeral or the sacred legends for the medicine dance or something like that. Some things people just have to go through the ceremony and to their Elders. They can't walk around it and get it from Rosetta Stone." While online courses can be powerful tools for sharing knowledge, Indigenous Nations and organizations must decide what is appropriate to share in this format.

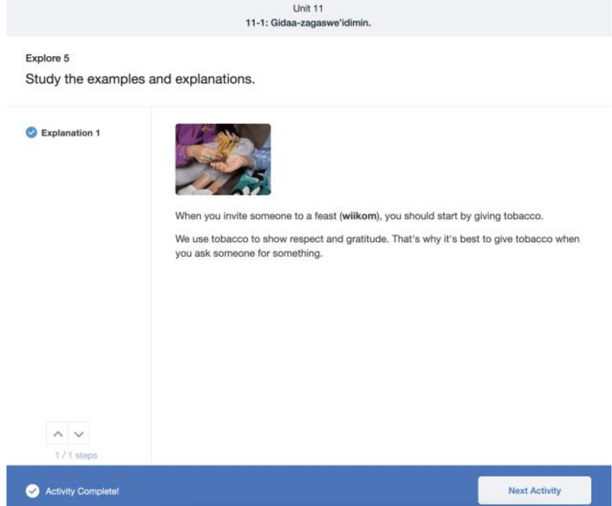


Image: Ojibwe Rosetta Stone

Image: Indigenous parent and child use laptop

ASSESSMENT

Kari A. B. Chew

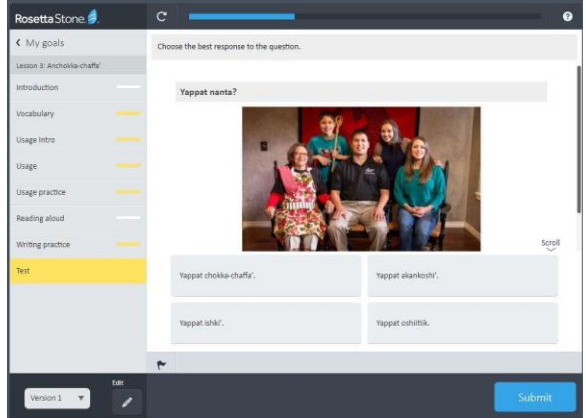


Image: Chickasaw Rosetta Stone

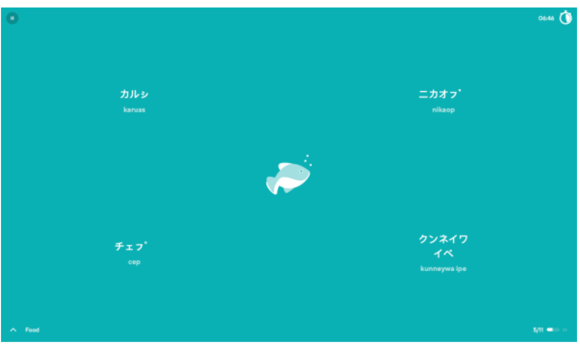


Image: Drops Ainu

Image: Navajo Duolingo

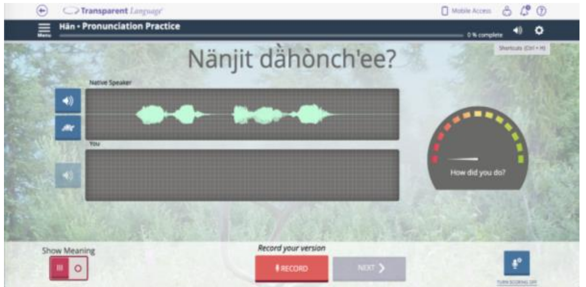


Image: Hän 7000 Languages

All the CALL platforms we reviewed had some form of learner assessment in which learners answer questions or do activities based on the content of a lesson. Existing approaches to assessment on popular CALL platforms do not reflect Indigenous relational epistemologies, and Indigenous course creators have little flexibility when working within the confines of the existing technology. Based on our research, we determined that assessment is an area in need of growth and development within CALL, especially for Indigenous language courses. In this section we share an overview of approaches to assessment in CALL courses, examples of relationality from our course review, and suggestions for relational approaches to assessment within CALL courses.

Approaches to Assessment

Quizzes and Tests vs. Games.

The platforms we reviewed either approached assessment through designated quiz (or practice) and test sections or through games or gamification. For example, Rosetta Stone and 7000 Languages courses had designated sections of lessons or units focused on assessment. In contrast, Drops takes a game-based learning approach in which assessment happens seamlessly as part of a game environment. Similarly, Duolingo gamifies its courses, integrating assessment throughout lessons and checkpoints (Shortt et al., 2021). Learners can earn points, badges, and other rewards. Notably, game-based learning and gamification are not the same thing. Game-based learning relies on actual games whereas gamification incorporates principles of gaming in non-game environments.

Question and Activity Types.

Across courses, the most common types of assessment questions were matching, multiple-choice, fill-in-the-blank, drag-and-drop, spelling, and word/conversation-order questions. These types of questions help learners memorize vocabulary, conjugate verbs, respond to questions, work on oral and written comprehension,

translate between languages, and practice other skills. Some platforms and courses avoid the use of English in assessment while others rely more heavily on English for instructions and translations. Depending on the platform, feedback as well as an overall score may be provided when an individual question is answered correctly or incorrectly.

Some courses also included opportunities for writing practice, usually by having learners listen to audio and then write what they hear using the orthography for the language. This type of practice can be helpful for building transcription skills important to language documentation work and to become more familiar with using the orthography. Related to this, some courses offered speaking practice activities where learners listen to an audio recording, record their own voice, and then receive feedback, usually a rating of accuracy. 7000 Languages courses use Transparent Language's EveryVoice™ speech analysis technology to provide a visual of the waveform of both the recorded speaker and the learner.

Examples of Relationality

Because approaches to assessment in CALL courses tend to be very rigid, with limited options for question types and typically allowing only one correct answer, it was difficult to see the enactment of relational epistemologies through simply reviewing courses. In fact, some approaches to assessment seemed at odds with Indigenous values and goals of decolonization. For example, Duolingo marks learner achievements through European imagery, like castles and crowns, as if the learner's goal is to conquer the language. Insight into how course creators centered relationality, despite these kinds of limitations, came from interviews. Those designing assessments enacted relationality through intentional choices to share language in cultural contexts and by keeping learners in their minds when creating content.

While working on Chickasaw Rosetta Stone, creators took an innovative approach to the assessment activities in lessons that conveyed traditional stories. The story lessons share the same story in a variety of formats, such as through video with narration and through audio clips paired with grammar instruction. The goal of each lesson is to prepare learners to retell the story in their own words to someone else. The assessment section shares the story in shorter audio segments paired with questions that emphasize listening comprehension and critical thinking. The questions ask what happened in the story and why characters may have acted the way they did. This holistic approach supports learners as they engage with the story. Giving learners the goal of sharing the story with someone else was a way to help learners take what they learned online and bring it back into offline environments, such as the home and the community.

Areas of Potential

Assessment in Indigenous language CALL courses is a space for potential growth. Even in off-line language learning environments, assessment often reflects Western approaches to learning. A maskiko-nehinaw (Swampy Cree) scholar, McIvor (2020) explains that "assessment tools that are created for other contexts do not work in Indigenous language learning environments," leading Indigenous communities to create their own assessment tools (p. 90). The NEȾOLṈEW̱ Assessment, for example, relies on learner self-assessment (McIvor & Jacobs, 2016). In 2021, Chew with the Chickasaw Nation Division of Language Preservation created a supplemental self-assessment, focused on learners' growth, connection, fulfillment, and effort, for students in classroom settings to use alongside Chickasaw Rosetta Stone lessons. Toward centering Indigenous relational epistemologies to support language learning, CALL courses would be an ideal space to implement self-guided models to help learners reflect on their personal development and progress over time.

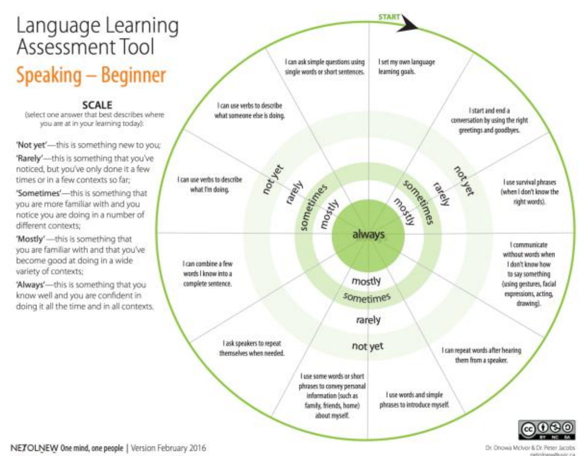
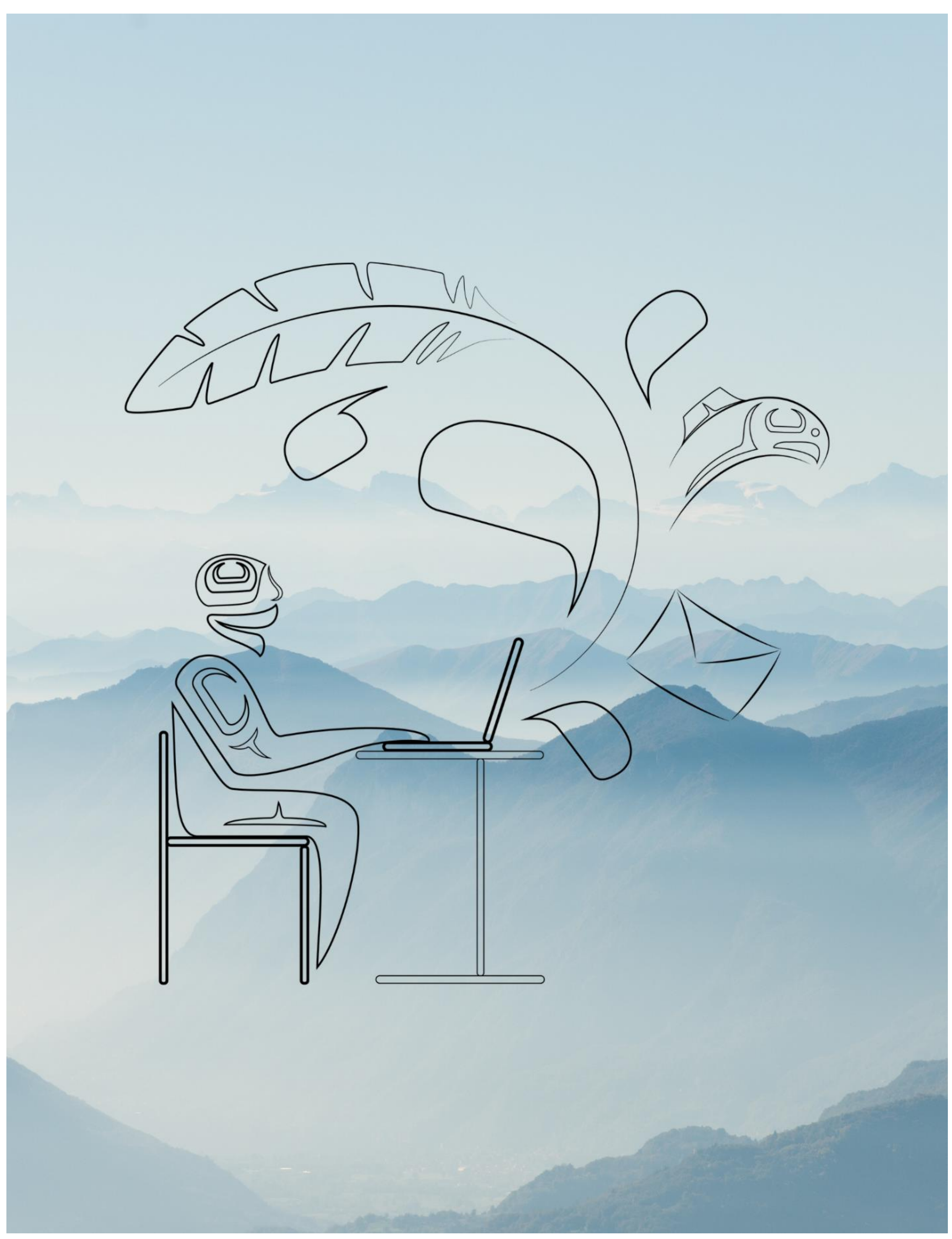


Image: NEȾOLṈEW̱ Assessment Tool



ORTHOGRAPHY AND **DIALECT**

Jackie Dormer

Online Indigenous language courses can include both oral and written representations of language. An essential step in creating a language course is choosing whether to include a particular dialect or variety of the language and whether to include written forms of the language. Over time, Indigenous languages' orthographies have been created by community members, academics, missionaries, and others for differing purposes. While some communities may use a single variety or single writing system, others may use multiple varieties and/or orthographies. This section shares ideas about how to honor differences in variety and writing in online Indigenous language courses and examples of how communities have made these choices, grounded in relational epistemologies.

Writing

A common goal for ILR is to support learners to *speak* the language with others. For this reason, communities may choose to emphasize oral over written language in their courses by including more audio than text activities. Still, in an asynchronous language course, writing can be an important tool. Writing can raise the visibility of the language (De Korne & Weinberg, 2021). It can also increase literacy and familiarity for those who are already fluent (Bontogon, 2016), making the course useful to both learners and speakers. The inclusion of writing should be approached with care and community guidance.

The Sounds of Michif

Many different ways of writing Michif have been used over the years. While there are multiple possible ways to write Michif, a standardized and unambiguous spelling system makes using the written word as a support for learning oral language possible. The more consistent and unambiguous a writing system is, the easier it is for learners, especially children, to acquire and use the language in creative and novel ways. Here is a pronunciation guide to the way Michif is written in this course:

Letter	Michif Example(s)	Notes
a	*apree* 'after', *niya* 'I'	As in English *about*.
aa	*maaka* 'but', *taanshi?* 'how are you?'	As in English *dawn*.
aeñ	*mataeñ* 'morning', *laeñjii* 'Monday'	Whenever you see the ***ñ***, it means that the vowel that precedes it is nasal.
añ	*parañtii* 'relatives'	As in French *enfant*.
b	*boñ* 'good'	
ch	*cheshkwa*! 'wait!"	As in English *chain*.
d	*diloo* 'water', *taandee* 'where'	
e	*galet* 'bannock'	As in English *bet*.
ee	*taandee* 'where'	As in English *say*.
eu	*bleu* 'blue', *feu* 'fire'	As in French *deux*.
f	*faam* 'woman', *frer* 'brother'	
g	*galet* 'bannock', *garsoñ* 'boy'	Always pronounced like the **g** in '**g**ood', and never like '**G**eorge.
h	*anihi* 'those'	

Images: Michif 7000 Languages

When choosing how to represent a language, it is important to realistically consider what system people are using or going to use. Some communities create their own writing systems, while others use systems that were created by non-community member linguists. Linguists typically create orthographies that are consistent in that each letter represents one sound, and one sound is represented by one letter. Once the system is learned, using it should be easy. However, many communities create writing systems that are based on how English is written, so they may be more familiar, but not necessarily consistent. While the linguist-designed writing systems may be more linguistically sound, perhaps members of the communities are not interested in learning new writing systems, or the current community system is already accepted. Ultimately, it is important to consider the needs of the community and what writing system the community accepts as its own (Hinton, 2014).

For example, there are multiple writing systems for the Michif language, some based on English sounds, and some that are more phonetic. The Michif course created with 7000 Languages uses a writing system that is more phonetically based, with each letter or letter combination always representing the same sound, and double vowels to denote long vowels. It also uses the tilde (~) to signify when a vowel should be nasalized. This system is based on work by Michif speaker Rita Flamand of Camperville, Manitoba.

The Michif course also explains why a specific writing system is used throughout the course while acknowledging that there are multiple ways to represent the language. This explanation encourages learners to respect all speakers of the language and its variations regardless of how they write it. Providing context such as this for the writing system(s) used may be another tool to ground your course within your community or nation's worldview.

When creating a course for a community with multiple orthographies, the community may choose one as a standard for the course for consistency (Bontogon, 2016). Having a standard for how the language is written keeps the course consistent, so learners are not confused by different spellings. Additionally, a written standard ensures that resources can be more easily used and shared (Genee & Junker, 2018). However, having a single standard writing system may restrict learners and instill fears of making mistakes. To this point Lillehaugen (2016) argues, "the absence of a standardized orthography, then, does not necessarily impede writing, and may in fact encourage writing in certain contexts" (p. 368).

One example of choosing a primary orthography comes from the Chickasaw Rosetta Stone course. The course uses the Munro-Willmond orthography, created by linguist Pamela Munro and Chikashshanompa' (Chickasaw language) speaker Catherine Willmond. This orthography is used in existing language resources such as a dictionary (Munro & Willmond, 1994) and grammar (Munro & Willmond, 2008) of the language, supporting learners to use multiple language learning resources together. The course creators also included the Humes orthography, created by Chickasaw speaker Vinnie May (James) Humes and her husband Reverend Jesse Humes, by sharing a table that compares the spellings of vocabulary words in each lesson. The inclusion of the Humes spellings allows learners to also use the Humes dictionary (Humes & Humes, 1972; available in web-based form at www.achickasawdictionary.com) to support their learning.

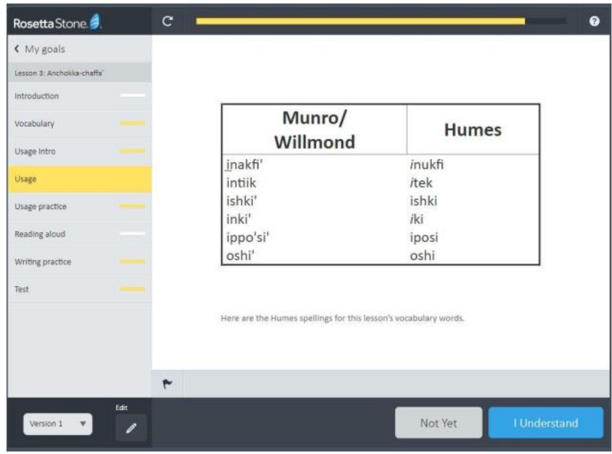


Image: Chickasaw Rosetta Stone

While lesson content is presented in the Munro-Willmond orthography, learners are not required to use this orthography. An optional "Writing Practice" activity is included in each lesson so that learners can practice their spelling. As the course creators explain, "The Chickasaw Nation encourages its citizens to engage with the language in a way that feels right for them, signaling openness to any form of writing or to the choice to not write the language down. For learners who do want to use the Munro-Willmond orthography, this section is available, but making it optional reflects community beliefs about writing Chikashshanompa'" (Chew et al., 2022, p. 242).

Another factor to consider is whether the writing system can be rendered in web-based programs. Using complex orthographies in CALL can be problematic as “web-based approaches are more dependent on the configuration of the user’s web browser, over which the developer has no control” (Holton, 2011, p. 378). To solve this issue, the Yukon Native Language Centre used image files rather than text to ensure all users view the content accurately (p. 369). Similarly, Carpenter et al. (2016) assert that “Unicode is central to achieving a baseline agreement about digital language encoding” (p. 4).

Dialect

It is not always possible to save every dialect of an endangered language. For example, Labrador Inuttitut has developed several variations, due to communities being forced to relocate. Speakers located in Rigolet realize their specific dialect may not survive, so they hope to bring back a form of Labrador Inuttitut while keeping some words and expressions with their local pronunciations (Andersen & Johns, 2005).

If the course is meant for a large population, inclusive of multiple communities, a standard or prestige dialect may be used (Bontogon, 2016). However, if the course is meant for a specific community, that local dialect should be used. Further, “If the course utilizes non-standard conventions, the pros and cons should be weighed in order to ensure the language is taught efficiently and in a way that won’t be detrimental to the use of the language” (Bontogon, 2016, p. 35). However, many communities do not have “standard conventions” or an established writing system. In the case of Jejueo, standardization is ongoing, so the Jejueo Talking Dictionary project chose to use the orthography of the most recent lexicographic materials and list headwords and regional variants as they are in the reference materials (Saltzman, 2017).

Several courses and dictionaries also include multiple dialects and writing systems to honor all varieties of the language. For example, the Northern Paiute Language Project (an online resource that includes a lexicon and database) allows users to view entries in any of the four dialects used by the Northern Paiute community (Garret, 2018).

Including multiple dialects and highlighting similarities and differences between them can help learners understand the language better, in addition to showing respect for all community members. In her guide to creating a mobile application for language learning, Begay (2013) writes, “remember that some languages have differences in dialect based on location, age, or gender” (p. 98). Genee’s (2020) work on the Blackfoot Dictionary also insists on the importance of representing dialects, as they are markers of identity. In the Kwak̓wala language course, the course creators shared a statement reminding learners that they are a multi-dialect community, and all dialects should be acknowledged and respected.

*G̱ilakas’la ni’noḵsola

*G̱ilakas’la la’aḵus a’ekaḵila gax̱ano’x̱w.

Wiga xa̱n’s g̱a̱lg̱apoła, a’axsilaṗa, i’ax̱alaṗa, mayȧxa̱laṗa

Our elders would like to remind us that we are multi-dialect. We speak, understand and communicate in multiple dialects of our beloved language.

*Thank you wise ones.

*Thank you for taking care of us on the journey that brought us here.

*Come lets support one another, take care of one another, work together and respect one another

Image: Kwak̓wala 7000 Languages

NOTABLE **FEATURES**

Courtney Tennell

The courses we reviewed showed the creativity of the communities that created them. Each course had examples of relationality in video, images, audio, text-based instruction, assessment, or orthography and dialect. Some of the courses we reviewed had other notable features that strengthened relationality, but these features did not fit into the categories we have discussed so far. Examples of these features include community message boards and seasonal curriculum.

Forums/Community Message Boards

Several courses have a forum or community message board feature. This feature allows users to post questions and comments about vocabulary and other language related topics. Forums or message boards create online communities where language learners can connect, build relationships, and ask clarifying questions about what they are learning. Before creating a community message board, consider creating community guidelines or rules to keep conversations appropriate and respectful. Administrators need to make sure the comments being posted adhere to community guidelines and to delete spam or bot comments that may clutter the board. Not all platforms offer this feature, so if having a community message board is important to your course, it is best to check if this feature is available through the providers you are considering.

Seasonal Content

Some platforms and LMSs give creators the ability to make certain content available only at a selected times or seasons. One example was the Citizen Potawatomi Nation's Moodle (LMS) course. Director of Language Justin Neely explained the importance of this feature: "We have certain stories you'd only tell in the winter. We had the ability in Moodle to turn those on, turn them off." This feature allows learners to experience cultural teachings in an online format almost as they would in an in-person setting. While this feature was not created in the software for this express purpose, the Citizen Potawatomi Nation's language department used this pre-existing feature to enact relationality by placing the learner in the culture's timeline.

Teacher Tools

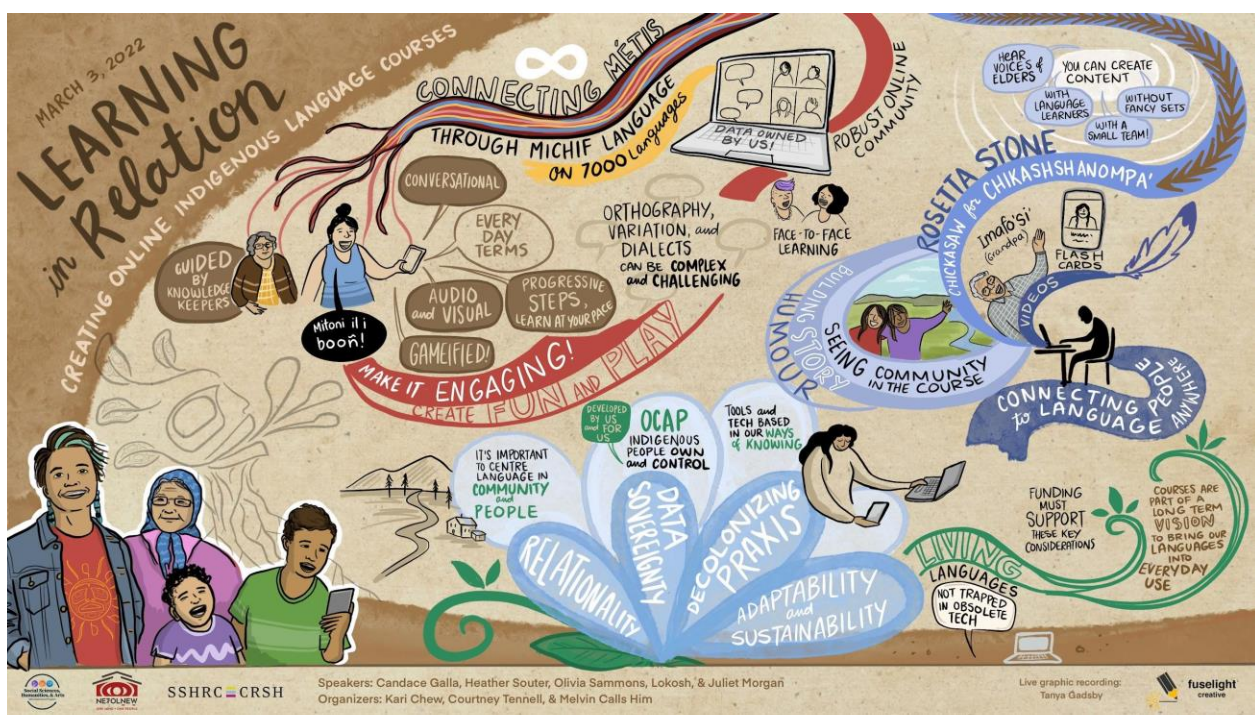
Public schools can be important sites for language revitalization (Chew & Tennell, 2022) and many communities created language courses with school use in mind. Therefore, teacher tools that support the use of courses in school settings are a helpful feature provided by some technology providers. One example is the Hän course, created by the Doyon Foundation in partnership with 7000 Languages. This course is set up in monthly units, running from September to May to correspond with the school year. The Citizen Potawatomi Nation also created courses for school use at both the middle school and high school levels. Other communities created courses primarily for community use and then created supplemental curricular materials to be used in schools. Both the Rosetta Stone Chickasaw and Ojibwe courses also have curricula to support language learning at local schools.

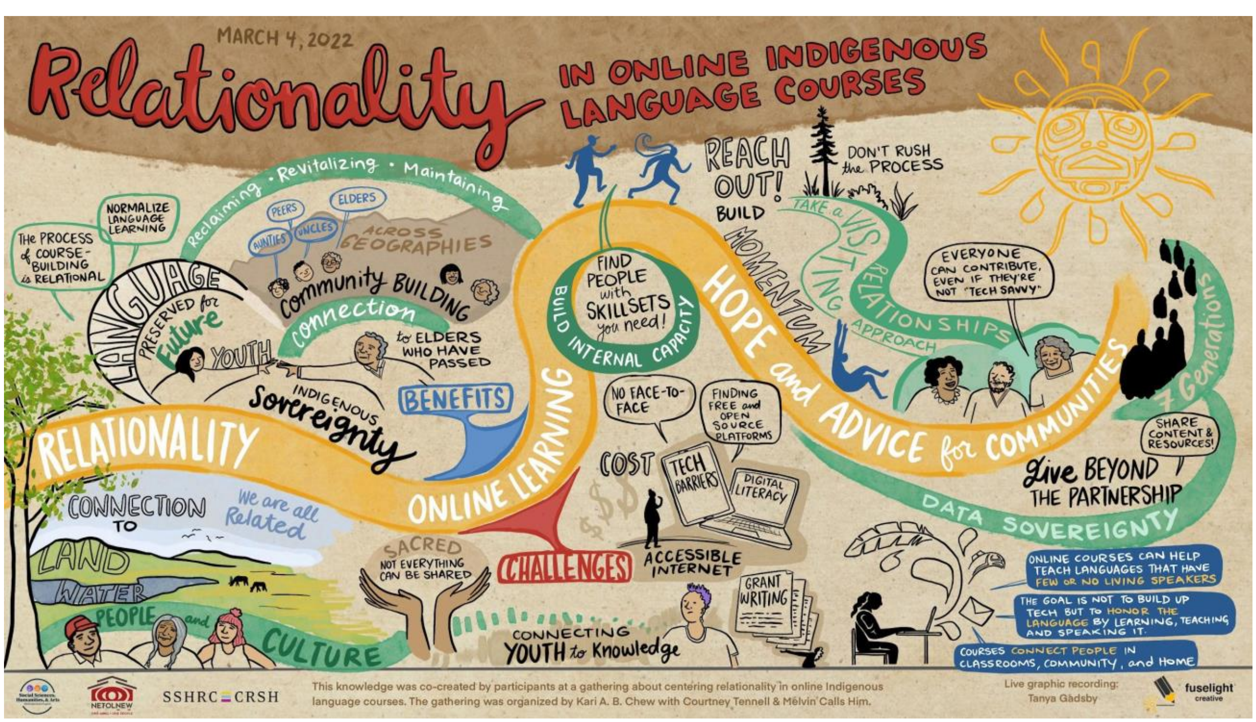
Features to Motivate Learning

Motivating users to continue their language learning can be challenging. Platforms offer different solutions for this issue. Memrise uses a leaderboard where users accumulate points for time spent learning and questions answered. Users with the most points appear at the top of their leaderboard and rankings are displayed. These scores can help motivate users who are competitive and users who are learning with a group or class and want to compare their score against friends. Other platforms, such as Duolingo and Drops, use reminders to send notifications to users encouraging them to continue learning. These friendly reminders alert users to engage with the language program daily or weekly, depending on the platform. Users have noted that this feature is helpful in prompting them to use the app. The Duolingo Hawaiian team shared that this feature was a positive aspect of their partnership with Duolingo: "Sometimes you may miss a day, but Duolingo was sending a friendly reminder, like, 'Oh, sorry, we didn't see you today. How about checking in now?' Many folks are that kind of a learner." These features motivate users to stick to their learning.

LEARNING IN RELATION **GATHERING**

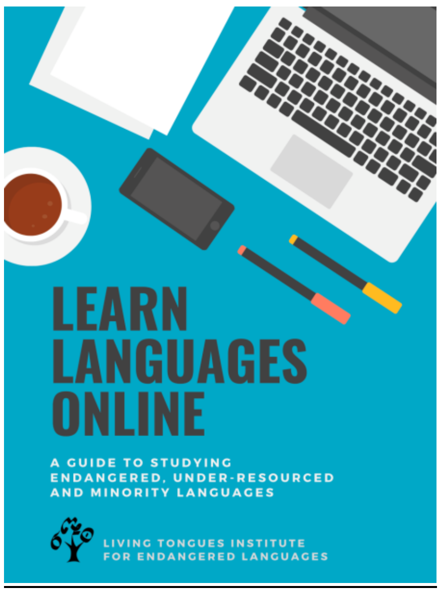
Watch the webinar recording in English (with ASL interpretation) or Spanish.





RESOURCES

Check out these additional resources created by other organizations!



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