Centering relationality in online Indigenous language learning:
Reflecting on the creation and use of Rosetta Stone Chickasaw

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Drawing on the authors' experiences developing Rosetta Stone Chickasaw (RSC), an asynchronous online Chikashshanompa' (Chickasaw language) course, this article shares examples of how relationality is enacted in online Indigenous language learning. We discuss the RSC interface and ways that it created opportunities and barriers to centering Indigenous and Chikasha (Chickasaw) relational epistemologies in which people are related to one another, the land, the spirits, and to the language itself. Our reflections on relationality in RSC are guided by the following questions: What relationships are required to create an online Indigenous language course? How do people create and strengthen relationships in online education spaces? How can online language work be re-emplaced in off-line relationships? Sharing examples from RSC, we consider relationality in video, audio, images, written instruction, and assessment. We conclude by returning to our guiding questions, offering our reflections and encouragement to others who may undertake similar work.

1. Introduction   In an Indigenous paradigm, knowledge is locally situated, held within languages, and inherently relational (Wilson 2008). Enduring legacies of colonization, including English-only schooling, separation of families, and the taking of land, have threatened natural processes of intergenerational knowledge sharing and the continuance of Indigenous languages (see McCarty et al. 2019; McCarty 2020; Crowshoe et al. 2021; Phyak & De Costa 2021). Gathering in person to eat, be on the land, and connect with others is an ideal way to transmit Indigenous languages. However, for Indigenous communities that are displaced from their territories, have large diasporic and urban populations, and/or have few to no remaining speakers, in-person activities are not always possible. In these cases, communities may turn to technology to create online spaces for language sharing. While a shift online of-

fers new possibilities for connection (Alexander 2018), it can also create barriers to effective language learning and teaching, as "place, relationships, and community building become virtual constructs" and the norms of communication change (Restoule 2019: 1298). Drawing on the authors' experiences developing Rosetta Stone Chickasaw (RSC) – an asynchronous online *Chikashshanompa'* (Chickasaw language) course currently used by over 8,000 people – this article considers how relationality is enacted in online Indigenous language learning.[1]

While most research about online language education focuses on the development or efficacy of a particular product for learning or teaching an Indigenous language, we address how approaches to teaching Indigenous languages online can be grounded in Indigenous ways of knowing and being. In this way, our focus is not on Rosetta Stone as a platform but rather on the relational practices that we implemented – and that others can also implement – in the development of an online Indigenous languages course. We engage a conceptual framework grounded in and guided by Indigenous and *Chikasha*[2] (Chickasaw) relational epistemologies in which people are related to one another, the land, the water, the plants, the animals, the spirits, and to the language itself (Wilson 2008; Hermes et al. 2012; Elliot-Groves et al. 2020). Restoring these relationships through and to language entails processes of decolonization (Smith 2012) and reclamation of "the appropriate cultural context and sense of value that [Indigenous] language[s] would likely have always had if not for colonization" (Leonard 2011: 141). A decolonizing approach rooted in a relational epistemology is critical to creating and improving models of online Indigenous language learning that reflect culturally sustaining and revitalizing pedagogies and align with the aspirations of Indigenous communities for their languages (McCarty & Lee 2014).

Our reflections on relationality in our work and course are guided by the following questions:

1. What relationships are required to create an online Indigenous language course?
2. How do people create and strengthen relationships in online education spaces?
3. How can online language work be re-emplaced in off-line relationships?

We begin with our relationships to place and to each other. Following a discussion of current scholarship about relationality and online language courses, we pro-

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[1] This article evolved from a Talk Story session, supported by the National Science Foundation, that the authors cofacilitated at the 7th International Conference on Language Documentation & Conservation (ICLDC), called "Recognizing Relationships," and held virtually in March 2021. We are grateful to the Talk Story participants who helped us think about relationality in online language education spaces. Yakkookay iichimanhi.

[2] This name is also spelled Chikashsha. For this article, we use the spelling Chikasha, which is preferred by Elder anompí'shi' and the Chickasaw Nation. Throughout the article, we italicize the first usage of Chikashshanompa' terms and offer a translation in parentheses.

vide an overview of the RSC project. Sharing examples from RSC, we consider relationality in video, audio, images, written instruction, and assessment. We conclude by returning to our guiding questions, offering our reflections and encouragement to others who may undertake similar work.

Throughout the article, we use the Chikashshanompa' term *anompa shaali'* (one who carries the language) to refer to Chikashshanompa' learners who are committed to Chikashshanompa' revitalization and reclamation efforts. We use the related term anompí'shi' (one who has the language) to refer to Chikashshanompa' first language speakers. Both terms, coined by Lokosh (Hinson 2019), describe more than just one's level of fluency; they express unique identities, relationships, and responsibilities within intergenerational Chikasha-led efforts to "bring Chikashshanompa' back to prominence among [Chikasha] people" (Hinson 2019: 459). As Elliot-Groves et al. (2020) explain, these types of Indigenous identities are "centered on the fulfillment of interdependent roles and relational responsibilities" (159). Lokosh (Hinson 2019) offers the term *anompa ibaashaali'* (one who carries the language with others) to express that the language is carried collectively and not just by individuals. We use *learner* generally to refer to people who may be using RSC but may not (yet) be anompa shaali' who are actively contributing to the collective work of language revitalization and reclamation.

2. Our relationships to place and to each other Guided by *Aba' Bínni'li'* (The One Who Sits Above) and accompanied by *Ofi' Tohbi' Ishto'* (The Great White Dog), *Chikasha Isipóngni'* (Chickasaw Ancestors) crossed the Mississippi River to their homelands situated on what is presently northeastern Mississippi, northwestern Alabama, western Tennessee, and portions of Kentucky. *Chikasha okla* (Chickasaw people) resided there until 1837 when the US government forced their Removal (see Paige et al. 2010). Chikasha okla arrived to what was then called Indian Territory, to the homelands of the Kitikiti'sh (Wichita), Hasinai (Caddo), Na i sha and Ndee (Apache), Nʉmʉnʉʉ (Comanche), and Cáuigù (Kiowa). Though Removal profoundly impacted Chikasha kinship systems, which were rooted in place, Chikasha okla nurtured new relationships to land and maintained strong family connections. Today, the Chickasaw Nation has over 70,000 citizens and is located on a treaty-guaranteed reservation in what is currently south-central Oklahoma. This is where our language work takes place.

As scholar-practitioners committed to supporting the reclamation and revitalization of Chikashshanompa', we knew each other prior to beginning the RSC project in 2015. When we began the project, we were all in graduate school, pursuing our doctorates, and had relationships to the Chickasaw Nation. Our paths crossed both through the Chickasaw Language Revitalization Program (CLRP) and in academic spaces, such as conferences focused on Indigenous languages. We share our academic credentials as part of our introductions not to boast but to emphasize that each of us contributes specialized knowledge and unique skills. Further, by highlighting our training and capacity as a team working for the Chickasaw Nation, we resist models of research and work that position non-Indigenous persons and/or organizations as experts and Indigenous communities as non-experts and mere sites of knowledge

extraction (Czaykowska-Higgins 2009).

We introduce ourselves in order of involvement with the project. Lokosh is a Chickasaw citizen and highly proficient anompa shaali', who learned the language as an adult. Lokosh finished his doctorate in Native Language Revitalization at the University of Oklahoma in 2019. He directed the CLRP from 2007 to 2022 and, in this capacity, invited both Juliet and Kari to contribute to RSC. Lokosh is now the executive officer of the Division of Language Preservation in the Chickasaw Nation's Department of Culture and Humanities. Juliet, who is not Indigenous, joined the RSC project in 2015 and received her doctorate in linguistic anthropology at the University of Oklahoma in 2017. Having collaborated on Chikashshanompa' revitalization projects since 2013, she is now a senior linguist at the CLRP. Kari is a Chickasaw citizen and anompa shaali', who joined the project later the same year. She earned her doctorate in Indigenous language education at the University of Arizona in 2016 and contributes to Chikasha and Indigenous language work as a scholar-educator. Together, we, with the guidance of Elder anompí'shi' advisors and Chickasaw Nation leadership, as well as our partners at Rosetta Stone, including Marion Bittinger, who has been instrumental in this process, developed this course to provide access to Chikasha okla and others who desire to know Chikashshanompa'.

3. Computer-assisted language learning to support language revitalization Indigenous communities are increasingly utilizing technology to support Indigenous language revitalization and reclamation (ILR) (e.g., Galla 2016; Meighan 2021; Brinklow 2021). These technologies include computer-assisted language learning (CALL), which refers broadly to the use of computers and related technologies in language learning and teaching (Hubbard 2021). The focus of this article is on asynchronous Indigenous language courses created through partnerships with technology providers and Indigenous Nations or organizations. These courses are sequenced, self-directed learning experiences that follow a curriculum created by the Indigenous Nation, sometimes with input from the technology provider. Though literature focused on online Indigenous language courses, especially with attention to relationality, is relatively limited, Indigenous language courses are numerous. There are over one hundred Indigenous language courses, including Anishinaabemowin (Ojibwe), Chikashshanompa' (Chickasaw), Diné bizaad (Navajo), Kanien'kéha (Mohawk), and 'Ōlelo Hawai'i (Hawaiian) on platforms run by nonprofits like 7000 Languages and mainstream companies like Cudoo, Drops, Duolingo, Mango Languages, Memrise, and Rosetta Stone.[3] Notably, these courses vary significantly in terms of quality and the amount of content covered.

Current scholarship that brings together ILR and CALL provides some initial insights into the theme of relationality in online language learning spaces. Nearly all CALL platforms are designed and controlled by Western companies (Alexander 2018). As a result, these technologies have contributed to Indigenous community

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[3] A map created by Kari A. B. Chew, Courtney Tennell, and Melvin Calls Him Jr. shows Indigenous languages courses on various platforms: https://maphub.net/onlineILR/indigenous-language-courses

concerns of privacy, issues of data sovereignty and ownership, and the appropriation of Indigenous knowledges (Galla 2018b) and have functioned as "yet another form of colonization that reinforces the Western-based dominant modes of knowledge systems and worldviews" (Galla 2018a: 104). Most communities exercise educational sovereignty through a process of "finding ways to exploit […] [existing] technologies to promote and benefit ILR efforts in ways that were not available before" (Galla 2018a: 114). As part of a relational epistemology, goals of connecting people to each other, the land, and the language and of promoting community well-being may exist alongside and even take precedence over goals related to advancing learners' language proficiency (Hermes et al. 2012; Hermes & King 2013; Galla 2016; Alexander 2018).

To meet their needs and aspirations for ILR and uphold educational sovereignty, Indigenous communities engaged in CALL find ways to maximize features offered by particular platforms not just "to retain the language (i.e., teach and learn it more effectively) but also to retain the worldview and understandings within the language – what can be thought of as the spirit of the language" (Rosborough et al. 2017: 430). One of the key benefits of CALL is that it can be highly responsive to different learning contexts and outcomes. Thus, there is opportunity for Indigenous communities to adapt technology in ways that uphold the spirit of the language and meet their educational and linguistic needs. As Cherokee online language course creator Alexander (2018: 98) affirms, "having access to language […] is less about learning vocabulary and more about being in control of one's history, present, and future in a holistic way" that allows Indigenous language learners to "reclaim power over their lives."

Online Indigenous language learning spaces can facilitate the emergence of a unique community of practice with learners and speakers engaging in ILR and reclamation online (Alexander 2018; Galla 2018a). CALL programs and other similar technologies play a key role in providing access to language and, in some cases, allowing for "synchronous communication, in which learners and speakers correspond in real time" (Galla 2016: 1143). Along with connecting learners to the language, speakers, and other learners, CALL programs are spaces where "Indigenous languages can be experienced in digital and virtual domains that offer an immersive experience and a reconnection to the land where the language resides" (Galla 2018a: 109). The ability of CALL programs to connect Indigenous language learners to one another and to place – for the purpose of strengthening ILR efforts – is critical given that the separation of Indigenous peoples from their lands, languages, and communities has long been an agenda of colonization.

4. An overview of the Rosetta Stone Chickasaw (RSC) project To ensure the continuance of Chikashshanompa', Chickasaw Nation Governor Bill Anoatubby established the CLRP in 2007. The CLRP currently has twenty-eight staff and program participants and works weekly with nine people who speak Chikashshanompa' as a first language. The CLRP uses two orthographies: the Munro-Willmond orthography, developed by linguist Pamela Munro and anompíʼshiʼ Catherine Willmond (see Munro & Willmond 1994), and the Humes orthography, developed by anompíʼshiʼ

Vinnie May (James) Humes and her husband Reverend Jesse Humes (see Humes & Humes 1972). The Chickasaw Nation does not have an official orthography and respects the writing systems used by individuals. The CLRP oversees several initiatives for children and adults, including those who reside within the Chickasaw Nation and those who live beyond tribal jurisdictional boundaries. These initiatives include camps, clubs, and an adult immersion program. The CLRP has also long utilized technology to support Chikashshanompa' revitalization. In 2009, the CLRP released an iOS application called ANOMPA Chickasaw Basic (www.chickasaw.net/anompa), which shares recordings of Chikashshanompa' words and phrases organized by theme. It has further developed a robust collection of Chikashshanompa' videos for the media platform www.chickasaw.tv. Because efforts have been well documented (see Chew 2015; 2016; Morgan 2017; Chew 2019; Davis 2019; Hinson 2019; Chew & Hinson 2022), the focus of this section is on RSC.

Lokosh (Hinson 2019) recalls that as soon as he became the CLRP director, he began receiving requests from citizens for a Rosetta Stone course for the language. He first contacted Rosetta Stone in 2008 to receive information about their Endangered Languages program, followed by a more formal inquiry in 2010. At that time, the Endangered Languages program was not accepting new projects. When Lokosh followed up in spring 2011, Rosetta Stone informed him that the Endangered Languages program was no longer active. Through the Chickasaw Nation's relationship with advertising agency and media company Ackerman McQueen, the CLRP arranged a meeting with Rosetta Stone executives in March 2015. Following a lengthy proposal and contract negotiation process, the RSC project began on September 15, 2015. Levels 1, 2, and 3 were released in 2016, 2018, and 2019, respectively. At the time of writing, Level 4 is still being developed after production was delayed by the COVID-19 pandemic. All levels are available free to Chickasaw citizens and can be purchased by noncitizens. The following subsections provide an overview of the RSC interface.

RSC is a custom product that differs from Rosetta Stone's current mainstream language courses. RSC uses a different software structure and includes culturally and grammatically appropriate, context-rich, and compelling content for learners (our methodology for creating this content is discussed in §5). It comprises four levels, each with forty, one-hour lessons. In this section we provide an overview of the custom product by focusing on the structure of one lesson. All lessons are structured the same, though the content varies. We explain which parts of the lesson were flexible in terms of customizing content and which parts we could not change.
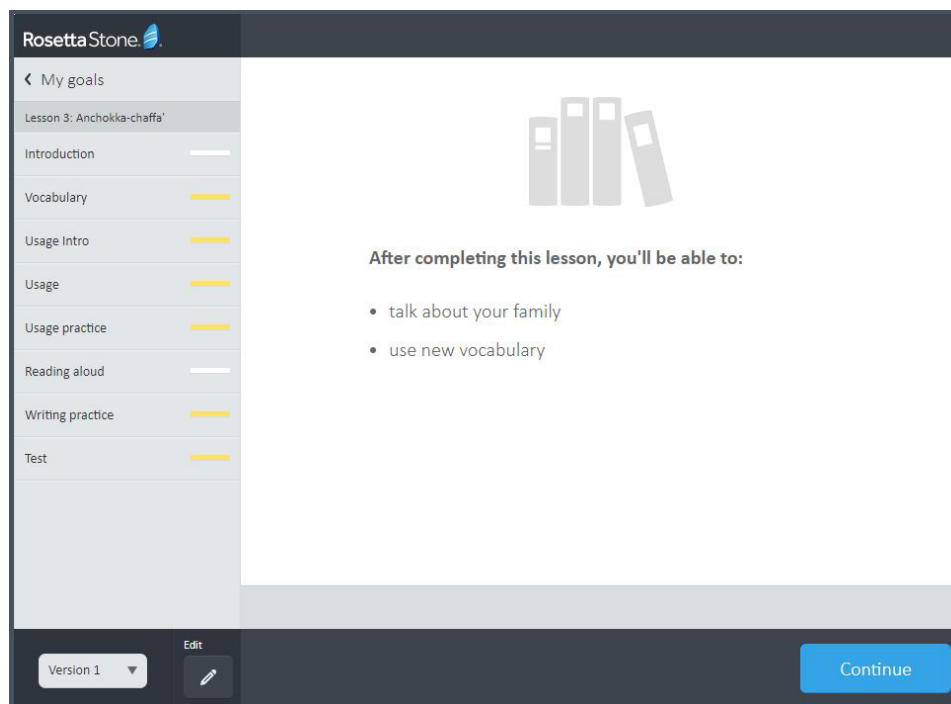
Figure 1. The Rosetta Stone Chickasaw menu

When a learner logs into RSC Level 1, Lesson 3: Anchokka-chaffa' (My Family), they see a main menu (see Figure 1). The screen has a menu bar on the left-hand side and the introductory page for the first lesson of the first level. The learner sees what they will accomplish during this lesson. We were able to edit the goals and lesson title for our custom product, but we could not edit left-hand menu contents. Each lesson includes eight sections in the following order: Introduction, Vocabulary, Usage Intro, Usage, Usage Practice, Reading Aloud, Writing Practice, and Test. Some of the section titles are better named than others, but we could not change the names of these within the software. We will briefly describe what sort of content each section typically includes.
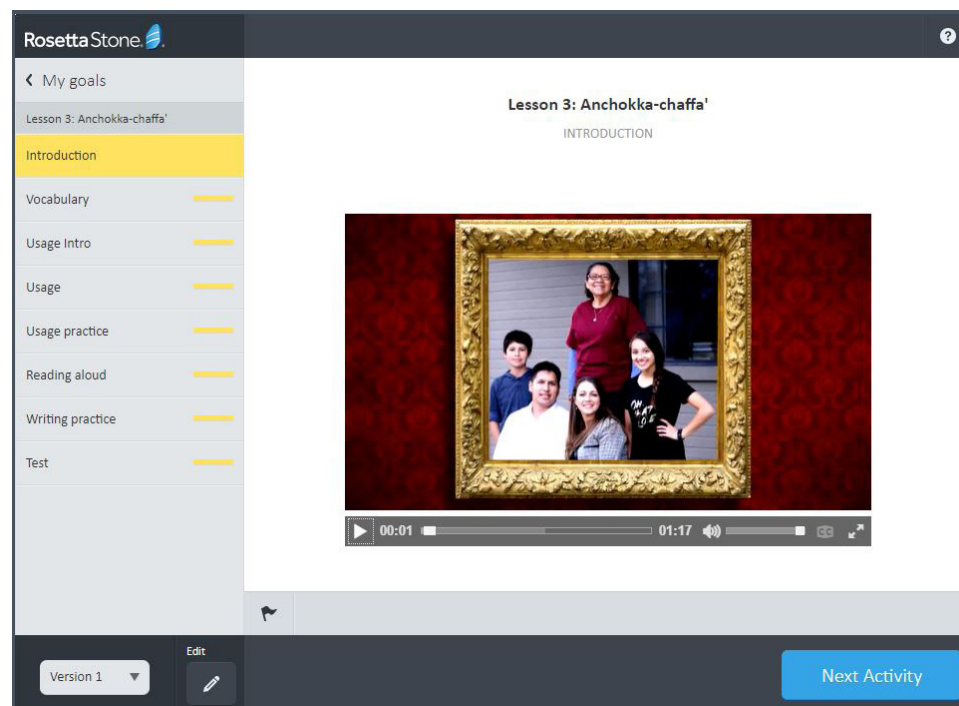
4.1 Introduction video

Figure 2. Introduction video

Each lesson begins with an immersive two-to-three-minute Introduction video (see Figure 2), which introduces the topic, vocabulary, and grammar for that lesson entirely in Chikashshanompa'. Rosetta Stone products usually use only or mostly image and audio media, but RSC centers each lesson on a video of a Chikasha family. We felt it was important to show a real family speaking Chikashshanompa' while living their lives in their home and community. Except for a series of lessons filmed in Oklahoma City, all RSC Introduction videos were filmed on the Chickasaw Nation Reservation. Additional locations included Mitchell Memorial Methodist Church in Ada, the Chickasaw Cultural Center in Sulphur, the grounds of the National Capital Building in Tishomingo, and other significant locations within the Chickasaw Nation Reservation.

Hiring Chikasha actors for immersion videos presented a challenge. We could hire either Chikasha actors with professional acting experience but no experience speaking the language, or Chikasha Elders who are anompi'shi' but who have no professional acting experience. We decided to use both. Pictured in Figure 3, the fictional Hikatubby family includes (from left to right) siblings Taloowa' (played by anompa shaali' Nevaeh Smith) and Nashoba (played by anompa shaali' Jariah Eyachabbe), their father Ben (played by anompa shaali' Jason Eyachabbe), their grand-

father Charlie (played by Elder anompí'shi' Luther John), their grandmother Lili' (played by Elder anompí'shi' Rose Shields-Jefferson), and their mother Lisa (played by anompa shaali' Kara Berst). Elder anompí'shi', like the late Pauline Brown and the late Stanley Smith, also had small roles as friends of the family. All other extras were played by Chikasha best suited to the location and event. All Chikasha okla working on the project were connected through a broad network of relationships: cultural, familial, professional, spiritual, and others. In fact, the actors playing Lisa and Taloowa' and Ben and Nashoba are mother-daughter and father-son in real life as well as on screen.

Figure 3. Rosetta Stone Chickasaw family

4.2 Vocabulary The next section teaches new vocabulary words. In Level 1, each lesson introduces anywhere from six to fifteen vocabulary words with an average of eleven. The number of new vocabulary words increases through the levels. By Level 4, the lessons introduce an average of seventeen new words. Each word is introduced with image and audio (see Figure 4). The learner can select the "listen" button as many times as they want to hear the vocabulary word. When the "speak" button is pressed, the learner repeats the word into their device's microphone, and Rosetta Stone's proprietary audio recognition software matches their audio against that of an anompí'shi' or highly proficient anompa shaali' and gives a passing or failing score. Using the "speak" button is optional. While learners are encouraged to use the language they learn with other people, they may prefer not to "speak" to their computer or device or to record themselves.
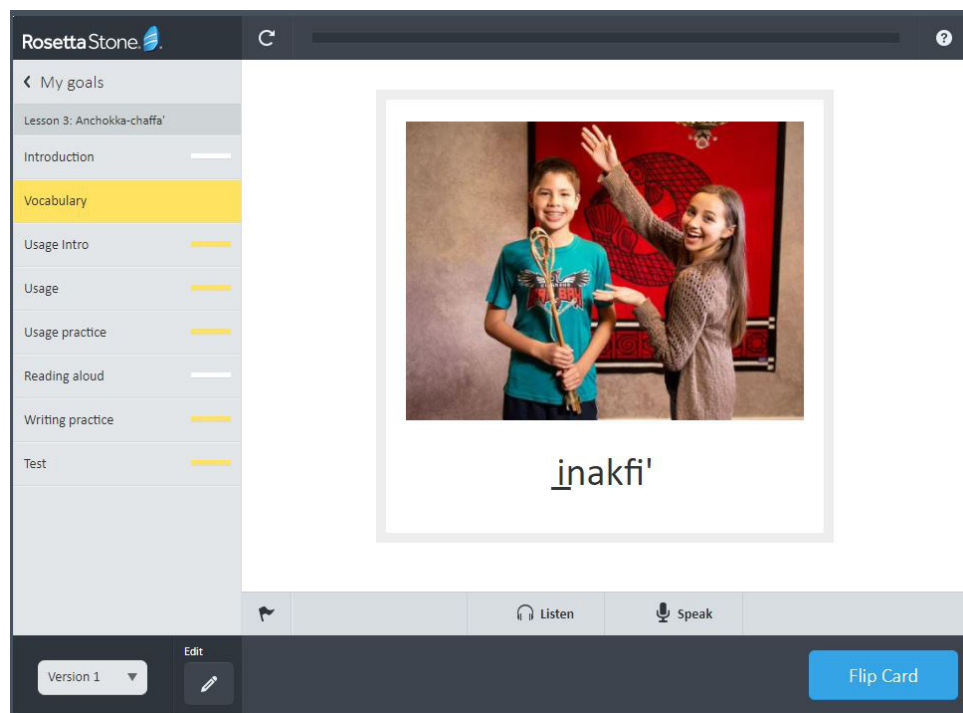
Figure 4. Vocabulary card front

The learner must then flip the card to reveal the English translation of the vocabulary word (see Figure 5), along with two example sentences. To complete the Vocabulary section, the learner must select "I Understand" for all words. If the learner selects "Not Yet," then that vocabulary card will reappear at the end until the learner selects "I Understand." This was a feature of the Rosetta Stone platform that we could not modify.
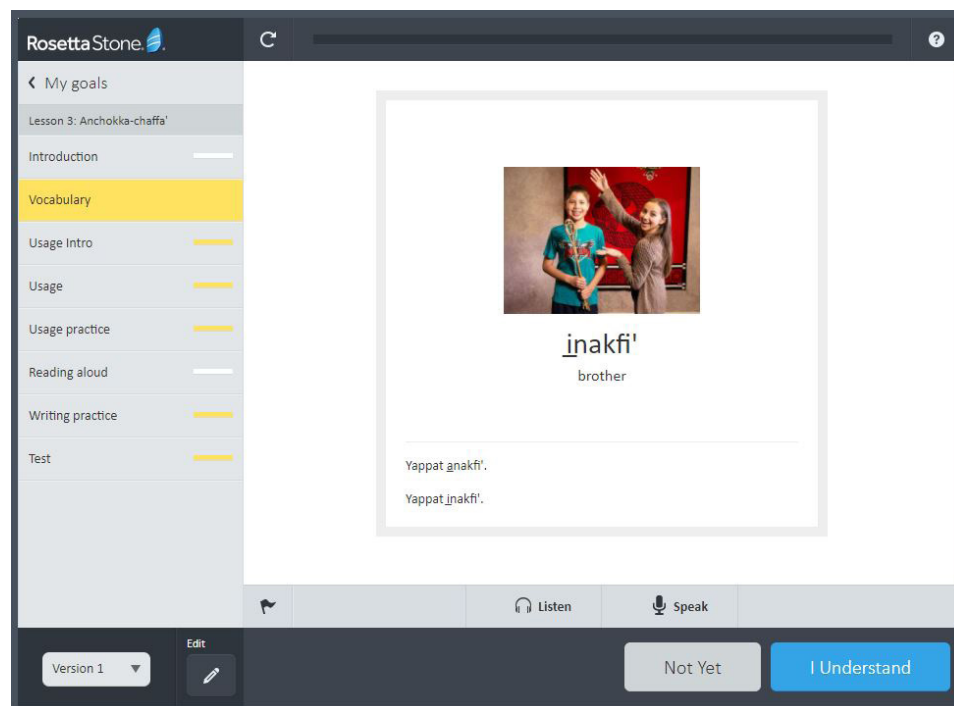
Figure 5. Vocabulary card back

4.3 Usage Intro The Usage Intro is a short video focusing on content that enhances the lesson. Some Usage Intros used clips of Introduction videos to highlight grammatical patterns, while others were structured like a presentation on a specific topic. These Usage Intros were used to teach grammar and pronunciation, expand vocabulary, educate about history, or discuss cultural topics. In Lesson 3, the Usage Intro illustrates the familial relationships of the Hikatubby family using Chikashshanompa' family terms (see Figure 6).
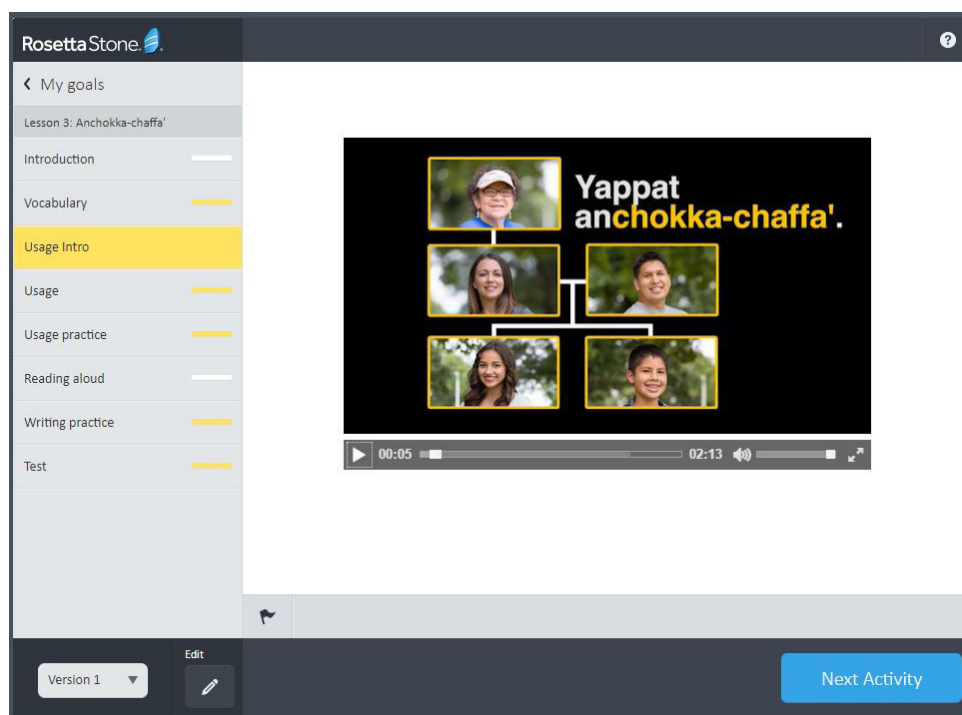
Figure 6. Usage Intro

    Teaching language is not the only, or even always the primary, goal in these videos. While the Introduction videos discussed topics only in Chikashshanompa', some Usage Intro videos delved deeper into discussions of culture and history in English to provide additional context for topics that were introduced in the Introduction video. For example, some Usage Intros teach learners in English about ILR, Indigenous language learning strategies, traditional stories, and important historical events such as boarding schools and Removal.

4.4 Usage The Usage section is designed to explain topics introduced in the Introduction video. Usage is structured as a series of cards (see Figure 7). Most of the cards focus on explaining grammar, but pronunciation, culture, and orthography are also discussed. For the grammar cards, the top of the card has Chikashshanompa' sentences with translations, and the bottom of the card, displayed in a smaller text, explains and describes the grammar of the sentences.
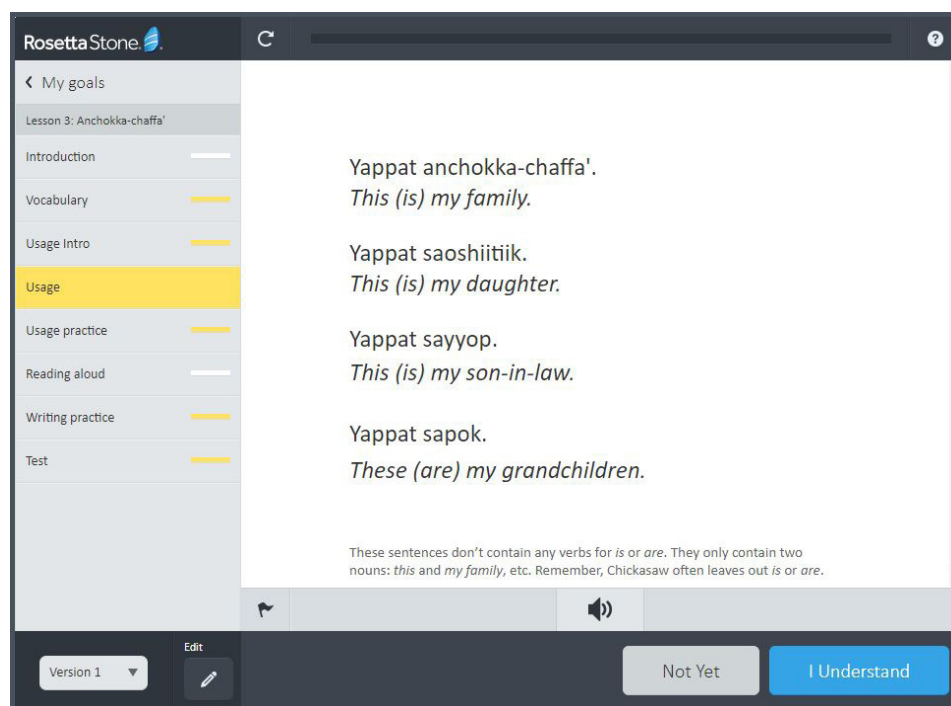
Figure 7. Usage card

Most of the Chikashshanompa' sentences in this section are directly from the Introduction video, and this is the only place where a learner sees Chikashshanompa' sentences with English translations (the Vocabulary section does provide English definitions but only of single words). The cards also explain phonological rules to help with pronunciation. Usage content is written in the Munro-Willmond orthography, and, at the end of each lesson, a table is included to show words from the lesson in the Humes orthography, which is preferred by some members of the community. Every lesson also includes cards that focus on culture. The Culture Cards teach learners about topics like the clan system, current Chickasaw Nation programs, storytelling, games, food, annual community events, and important figures both past and present.
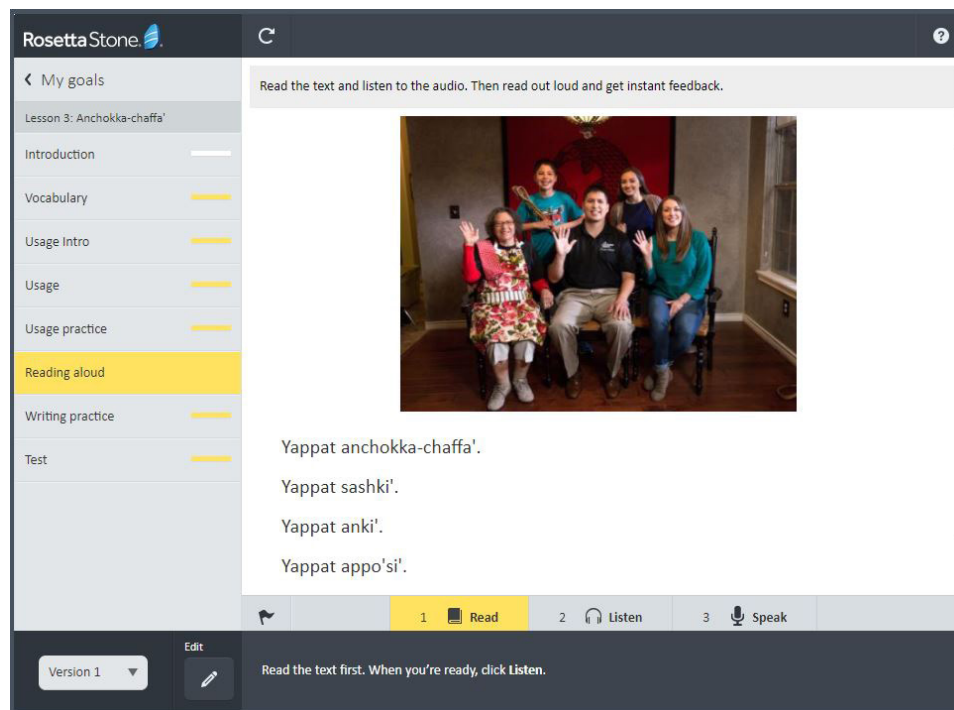
4.5 Reading Aloud

Figure 8. Reading Aloud

The Reading Aloud section allows learners to read a sample of Chikashsha-nompa' text, listen to an audio sample recorded by anompí'shi' and highly proficient anompa shaali', and finally record their own variety of spoken Chikashshanompa' based on the reading passages (see Figure 8). This recorded speech is then compared to a database of Chikashshanompa' speech collected from Chikasha okla, including anompí'shi' and anompa shaali' interested in the project but not necessarily possessing a great deal of knowledge of the language. The speech analysis program compares the recorded speech to the database and generates an accuracy score (see Lovaas et al. 2017). We designed the speech corpus to specifically include anompa shaali', as opposed to just anompí'shi', to allow for variation in pronunciation without penalizing learners for less-than-perfect speech. Learners report frustration with being unable to produce a perfect score, but this falls in line with the experience of anompí'shi' who, while regularly achieving 90% plus scores, have generally been unable to produce a perfect 100% speech sample. Reading Aloud is optional, so learners can skip over this section and still successfully complete a given lesson. It is the only section in the product that asks learners to produce speech.
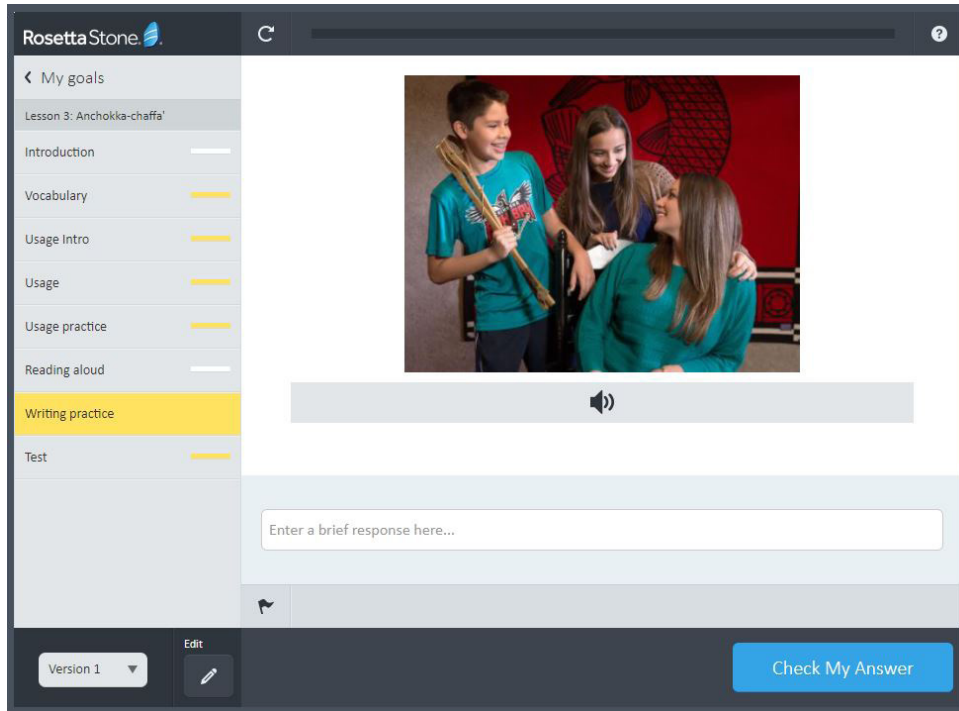
4.6 Writing Practice

Figure 9. Writing Practice

Writing Practice offers learners the opportunity to use their knowledge of the modern Munro-Willmond orthography to write passages in the language based on audio prompts recorded by anompí'shi' and highly proficient anompa shaali' (see Figure 9). Some learners may not find this exercise helpful because they may choose to use a different orthography, or they may not want to write the language at all. The introductory slide in this section tells learners that Writing Practice is optional. We did not want to require learners to write the language down and especially did not want to impose a particular orthography, but the nature of the software required a finite list of "correct" spellings for this exercise. 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'. This approach could potentially be used for other Indigenous languages with multiple orthographies, with different levels of vitality, or whose communities want to de-emphasize or not engage with writing the language.
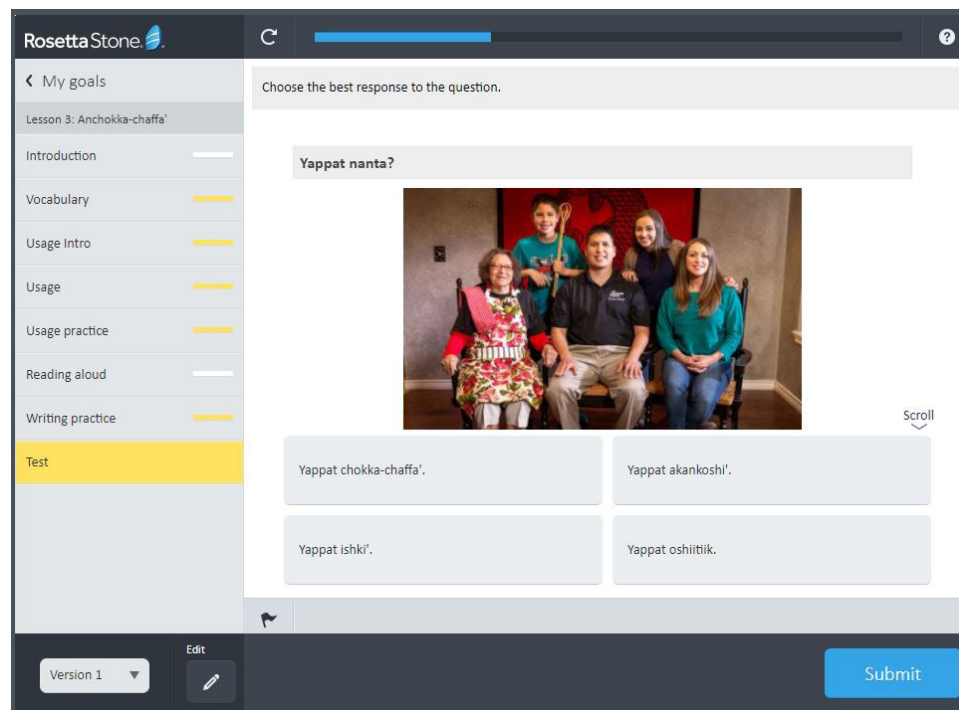
4.7 Usage Practice and Test

Figure 10. Test

An RSC lesson contains two separate sections focused on assessment called Usage Practice and Test (see Figure 10). Because they are very similar, we discuss both in this section. The Rosetta Stone platform allows course developers to create matching, multiple-choice, fill-in-the-blank, drag-and-drop-sentence, and word-order questions. As content creators, we worked to develop content for these predetermined question types. A limitation of the Usage Practice and Tests was that questions had to be designed so that there was only one correct answer possible. While there is no limit on how many questions Usage Practice and Test sections can have, we aimed to create about fifteen questions for Usage Practice and ten questions for Tests. Usage Practice functions as a practice assessment prior to completing the optional Reading Aloud and Writing Assessment sections.
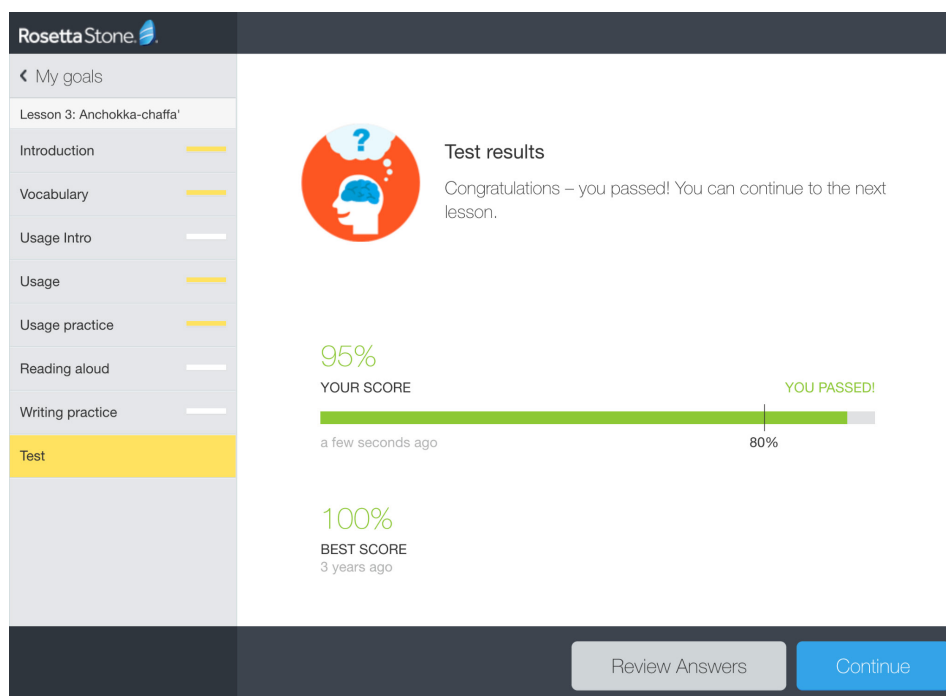
Figure 11. Test scoring

Learners receive immediate feedback on whether they answered a question correctly. If they did not answer correctly, they can try again. At the end of Usage Practice, learners see the percentage of questions they answered correctly. Regardless of their score, they can progress to other sections of the lesson. The primary difference between Usage Practice and Tests is that during the test, learners do not receive immediate feedback after answering a question. Instead, they answer all questions and then see the percentage of questions they answered correctly (see Figure 11). Learners must receive a score of 80% or above to pass the test. Learners can review the questions they answered incorrectly. When retaking a test, the previous score is also displayed with the new score so that learners can compare outcomes and track their progress. Though there are no penalties for not passing (such as not being able to advance to subsequent lessons), they are encouraged to review the lesson and retake the test until they receive a passing score.

5. A community-based design methodology to create and reflect As the core team responsible for creating and adapting content for RSC, we offer a unique perspective on the online course. This section discusses our use of an evolving community-based design research methodology to both create and reflect. When the RSC project began in 2015, with Lokosh, Juliet, and Marion Bittinger of Rosetta Stone as project leads, we had not articulated a methodology for creation and reflection. As Lokosh

(Hinson 2019) explains, much of the creation process was guided by Rosetta Stone: "We began by studying reference scope and sequence documents from other Rosetta Stone projects, navigating through them while making changes, rejecting irrelevant suggestions and expanding where necessary" (214).

From this process emerged a scope and sequence document for RSC Level 1, comprising forty lessons, which guided the creation of scripts for the Introduction videos. With the project leads, a committee of Elder anompí'shi', including the late Jerry Imotichey, the late Pauline Brown, Rose Shields-Jefferson, and the late Stanley Smith, cocreated and reviewed each script. The scripts were next reviewed and approved by Chickasaw Nation leadership before moving into production. The Elder anompí'shi' committee reviewed the videos and subsequent edits, if required, before offering final approval. Following the completion of the videos, the next task was to create content for the RSC lessons. Kari joined the project at this point, and each of us worked on specific parts of the lessons. For example, while Juliet wrote grammar lessons for Usage, Kari made the Usage Practice and Tests, and Lokosh drafted content connecting language to culture. Marion oversaw all the moving parts of the project and provided guidance, in terms of working in the Rosetta Stone editor, throughout the process. After we created and uploaded all content for Level 1, we, along with CLRP staff and Chickasaw Nation leadership, thoroughly reviewed and approved the level for publication.

After completing Level 1, we reflected on our process of working together, what we had created, and what we would create next. We now understood what developing a CALL course entailed, and we met together with Marion to envision possibilities for the next level. In reflecting on our meetings and process, we characterized Level 2 as an opportunity to be more creative. We began to see ourselves as course creators who were in relationship to learners and embraced that the course existed within a language revitalization context. In Level 2, we began to share more direct language learning tips with the learners, including how to learn and use the language even when you might not have an Elder anompí'shi' or community of anompa shaali' to talk with. In Level 3, we were more intentional in centering Chikasha cultural values in the course. We introduced a storytelling approach, focused on Chikasha oral literature genres (see Hinson 2016), which complemented the family-centered approach and further grounded language in Chikasha epistemologies. At the time of writing, our work on Level 4 is in progress. This level will build on the approach taken in Level 3. Previous levels have utilized scripted and recorded language, while Level 4 will incorporate more examples of anompí'shi' just speaking Chikashshanompa'. The following section offers examples of relationality across all levels of RSC.

6. Enacting relationality in Rosetta Stone Chickasaw (RSC) To consider how relationality is enacted in RSC, the authors searched for examples across all levels of RSC in the categories of video, audio, images, direct grammatical instruction, and assessment. Many of the examples we offer center family. By highlighting these examples, we do not imply that Indigenous relational epistemologies are limited to human-to-human family relationships. Because the forced Removal of Chikasha okla from our homelands disrupted Chikasha relationships, the centering of family

in RSC is part of a reclamation of kinship. Thus, we affirm Taylor et al.'s (2019) "relational approach to designing technologies for Aboriginal and Torres Strait Islander languages that takes family communication and activities as the basis for technology design" (162). To center Chikasha relational epistemologies in RSC, we similarly chose to base the content on family as a means through which to express deeper understandings of relationality. Because these categories are common to many CALL courses, we hope that our analysis and reflections will have relevance to others who are working to teach Indigenous languages online.

6.1 Relationality in video Relational epistemologies in RSC video are enacted, in part, through the centering of family and Chikasha culture. We created all lessons around storylines featuring a Chikasha family doing activities together in their home and in the Chickasaw Nation. This choice contrasted with Rosetta Stone's usual curriculum, which focuses on teaching language to people (usually for tourism or business purposes) who plan to travel *away* from their home. Rosetta Stone initially proposed producing videos in a studio setting, with actors recorded against an all-black background. Such an approach reduces logistics and costs, but at the expense of not depicting place in the videos and erasing all relationality to the land. We were instead able to include high-quality, professionally produced videos due to a longstanding relationship between the Chickasaw Nation and the media agency Ackerman-McQueen, which maintains the custom digital platform and video programming on www.chickasaw.tv. The Chickasaw Nation invested in these videos, viewing them as important resources for language learning to be shared both within and beyond RSC. After each RSC level is completed, all videos are uploaded to www.chickasaw.tv platform to be freely accessed by anyone (https://www.chickasaw.tv/series/rosetta-stone-chickasaw). While an ample budget is helpful to produce videos, it is not required to create videos that center relationality. The most engaging videos in RSC feature family and community members using the language in the context of culture and place. Such videos could be created and even edited on a smartphone. Our primary motivation for using a media company was to be able to film all videos on location, at real sites in the community and inside a Chikasha person's home.

Focusing on the family and home reinforces the primacy of relationality in the Chikasha community. Relationships were strengthened and new ones formed as the actors and others involved in the project worked toward the completion of 160 lessons. We learned together over the course of the project and developed new approaches to videos. In Level 2, we began to focus on narratives shared by our Elder anompí'shi'. Some narratives focused on personal and family stories as well as community histories. In one lesson, the grandmother Lili' (played by Rose Shields-Jefferson) reflects on her experiences going away to school at Haskell and learning English. The script is based on Mrs. Shields-Jefferson's life. In another lesson, the family visits the Chickasaw Culture Center and hears from Elders who recount Chickasaw Removal and other significant events. In Level 3, we continued creating storylines around Elder narratives and prominently featured *shikonno'pa'*, a genre of possum stories that explain how day became divided from night, why some animals look the way they do, and other phenomena (see Hinson 2016). In Level 4, we engaged

learners more directly by creating videos that model effective strategies for language learning, such as Zalmai ʔəswəli Zahir's (2018) approach to creating language domains in the home.

The RSC actors reflected on the responsibility of leading a language education effort in addition to the growth that they experienced as members of the RSC family. Nevaeh Smith (Taloowa') stated in an interview:

> I'm really proud to be a part of this […] We've all [the cast] come really close together […] And I hope that people learn Chickasaw from this [...] [It's] awesome just knowing that everyone helped to help other people learn Chickasaw. These words mean a lot more now that I know more Chickasaw. (Chickasaw.tv 2017)

For Smith, the experience of working on RSC was characterized by personal growth and contribution to others in the community. Rose Shields-Jefferson echoed this sentiment,

> I'm happy that I can speak the Chickasaw language […] I think there's maybe forty fluent speakers that's left. And that's why I wanted to get involved in Rosetta Stone [Chickasaw]. You learn something, you teach somebody else, so that they can learn and carry on the tradition. I'm proud to be Chickasaw and Chikasha anompolilikạ yammakookya. I just want the young Chickasaw kids to be proud, too. Just do your part and try to keep that legacy going. (Chickasaw.tv 2020)

Shields-Jefferson's words express a sense of relationship between Chikasha okla past, present, and future, who are connected through language. RSC is one way of sharing that language.

6.2 Relationality in audio RSC shares significant audio resources across all sections of a lesson. Creating the audio files for RSC required a great deal of work "behind the scenes," as each audio segment was created through a collaborative process between Elder anompị'shi' and the development team. In most cases, Lokosh facilitated the audio recording process. Over many years, Lokosh has built close relationships to Elder anompị'shi' who mentored him in his own language learning. The relationships that developed between anompị'shi' and anompa shaali' are, in keeping with traditional Chikasha notions of kinship, reflective of an Elder auntie or uncle with a younger relative and go beyond merely mentor and mentee. With these kinship relationships come obligations of careful listening, care and respect for Elders, and deference in all matters of linguistic and cultural expertise.

These relationship dynamics followed us into the recording booth but were also at times challenging to navigate due to pressures to create specific outputs. For example, when creating audio recordings for the Usage, Usage Practice, and Test sections, the audio recording needed to adhere closely to a script to ensure that the learner would have a specific set of Chikashshanompa' example sentences related to

the lesson content. The development team created these scripts for approval by an Elder language teacher. Once a script was approved, an anompí'shi' would record it, usually with the assistance of Lokosh. Lokosh's role was to help the Elder anompí'shi' read from a script written in the Munro-Willmond orthography and to ensure that the quality of the audio recordings would be sufficient for the RSC environment. The Elder language teachers maintained editorial control throughout the process, often-times rerecording previously approved audio on the fly, literally sitting in the recording booth. Maintenance of editorial control by Elders, not only of language form but also of lesson content, was critical to maintain culturally appropriate interactions. With less common forms of the language or vocabulary that was not remembered, Elder anompí'shi' deferred to Lokosh's knowledge if they deemed that knowledge to be correct and appropriate.

There is a relationship between the learners and the voices that they hear within RSC. It was important to us to include multiple anompí'shi' so that learners could hear variations in language use. In addition to Elder anompí'shi', Lokosh also contributed audio recordings. Featuring the voices of anompa shaali' alongside anompí'shi' is a way of acknowledging that the knowledge anompa shaali' have of Chikashshanompa' is valid and critical to the continuance of language. As the late Jerry Imotichey reflected, it is the anompa shaali' who have a responsibility to "be the ones to carry [the language] on" (Chew 2016: 143). Some Elders, for example Jerry Imotichey and Stanley Smith, passed on during the development of RSC. Anompa shaali' present and future are still able to be in relationship to them through their contributions to RSC. It is a powerful experience to be able to still practice with these teachers who gave us so much. This is a strange, admittedly artificial new form of life for traditional relationships, but the entire exercise of language revitalization is in and of itself a strange and artificial process. We were never meant to be forced to recover or reclaim our languages.

6.3 Relationality in images A strength of the RSC interface is the ability to incorporate images in all sections of lessons, except for the Introduction and Usage Intro sections where videos are used instead. While the opportunity to incorporate images presents opportunities for Indigenous communities to use their own culturally relevant photographs to teach language, the work of locating and/or creating high-resolution images for use in an Indigenous language CALL course can be challenging (Westwood 2017). RSC contains hundreds of images, most of which are in the vocabulary sections of lessons. There are approximately 1,420 unique vocabulary words across the four levels, each requiring a unique image. Because of the sheer volume of images required, creators of Indigenous language CALL programs may use both community-created images and stock images, though there are limitations to this approach. Holton (2011: 382) discusses the lack of use of "locally sourced images" in Rosetta Stone Iñupiaq, pointing out that most images are stock photographs that do little to contextualize language in culture and community. In this way, choices about which images to use and where to source them have important implications for how relationality is either enacted or severed.

Our team utilized both stock images, from Getty Images, and custom images,

created by the Chickasaw Nation. Often the Rosetta Stone team sourced stock images, which were then reviewed by our team. While some images were straightforward to locate on Getty Images, such as an image of a cat for the *kowi'* (cat) vocabulary card, others were not. Stock image libraries, like Getty Images and others, can be problematic because images are based on marketing categories (Machin 2004), which privilege whiteness (Papadopoulou 2014) and commodify Indigenous peoples and cultures (Westberg 2021). Further, stock images, which tend not to "represent actual places or events" (Machin 2004: 316), are simply not able to convey Chikasha relationships to one another, the plants, the animals, the land, and Aba' Bínni'li'. A long-term goal is to replace all stock images with custom images, but during the initial development of RSC, this was not feasible.

Figure 12. Custom images

During the filming of Level 1 Introduction videos, photographer Marcy Davis was on set to take photos of actors modeling vocabulary terms. For example, the *tiwa'chi* (to stir) card shows Nashoba stirring the *pishofa* (a type of corn soup) he and his family are making in their crockpot. We also used custom images, sourced from tribal archives and current photo libraries, for vocabulary terms for ancestral foods, such as pishofa; cultural items and practices, such as *loksi' shaali'* (women who carry turtle shell rattles on their lower legs during stomp dances); and specific

places, such as *Kali-homma'* (Red Spring, an important gathering place in the Chickasaw Nation). These images express relationality in terms of connection to Chikasha okla past and present, places of importance, ancestral foodways, and spiritual and cultural practice. We also used custom images to convey the meaning of words that can have both culturally specific and more generic meanings. Words like *hilha* (to dance) or *to'li* (to play a ball game) refer specifically to Chikasha stomp dances and to the Chikasha game of stickball but can also be used to talk about any type of dancing or playing any type of game involving a ball.

6.4 Relationality in written instruction Written instruction proved one of the more difficult spaces in which to enact relationality. Most of the written instruction occurs in the Usage section of RSC lessons (though text does appear throughout all components of the lessons). The Usage section focuses on teaching *about* the language rather than *in* the language, with the intent of instructing the learner about grammar, pronunciation, spelling, history, and culture. We wanted RSC to complement existing language learning resources that learners were already using, such as the Munro & Willmond dictionary (1996) and grammar (2008). For this reason, we decided to align most descriptions of grammatical features of the language with the terms used in the Munro and Willmond materials. While these materials have been important resources in the creation of RSC, most grammatical descriptions emerge from Munro's perspectives as a non-Indigenous linguist and do not necessarily account for Chikasha epistemologies.

Still, we created opportunities to enact relationality. At first, we relied heavily on Culture Cards. While it was not ideal to separate cultural teachings from grammatical instruction, we found these cards to be especially important in Levels 1 and 2. For example, the Culture Cards in Lesson 41 of Level 2 expressed a Chikasha view of family relationships:

> Family is at the core of who we are as Chickasaws. Historically, Chickasaws didn't think of family as a nuclear unit of two parents and their children. Chickasaw families were (and often still are) large, with parents, children, grandparents, cousins, and adopted kin. Family relations extend over time and space. Even if we were related generations back, we're still kin in the Chickasaw Nation. The Chickasaw word for family, chokka-chaffa', means one house, and encompasses all those who live under one metaphorical roof.

This card provides learners with direct information about how Chikasha okla understand relationships to one another.
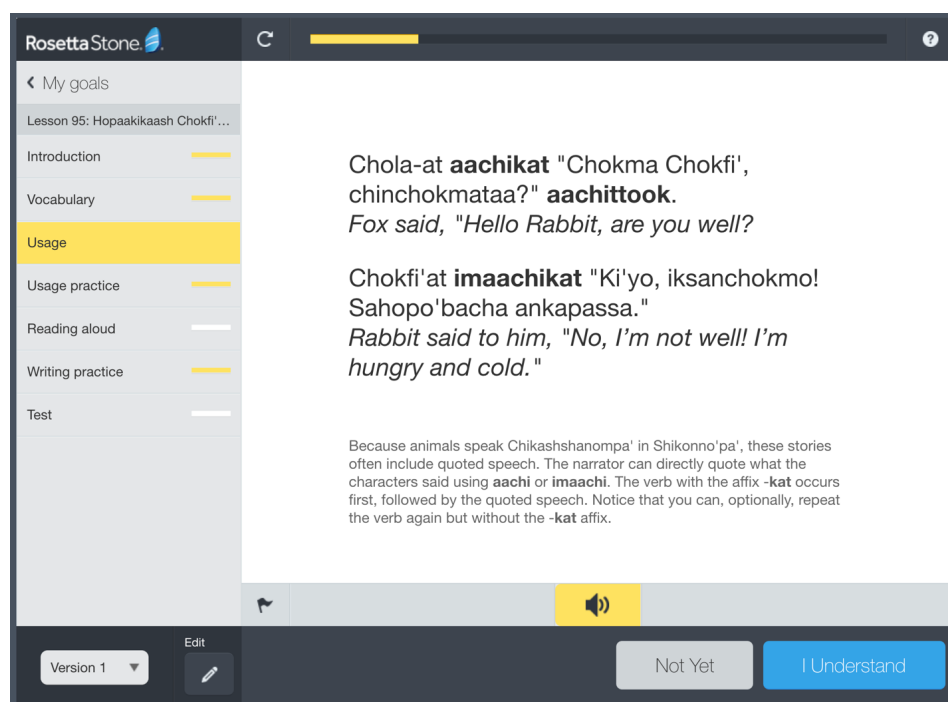
Figure 13. Written instruction in usage

In Levels 3 and 4, we worked more deliberately to integrate cultural teachings with grammar instruction. This approach aligns with Rosborough et al.'s (2017) offering that for Indigenous languages, "a combined attention to grammar and communication may be effective for both language acquisition and for the transmission of history, language, and cultural values across generations" (430). 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.

6.5 Relationality in assessment The question of how relationality is reflected and enacted in assessment within RSC is complex. On the one hand, early feedback from Chickasaw citizens indicated that language learners strongly desired assessment features in an online Chikashshanompa' course. Investing time and energy in creating the Usage Practice and Test sections as well as the Reading Aloud and Writing Practice sections within RSC was a relational practice of seeking out and

responding to input from Chikasha okla. At the same time, limitations of the Rosetta Stone interface restrained and even discouraged relational practices. As Limerick (2020) explains of standardized language proficiency exams, sometimes they can be helpful, but they can also perpetuate problematic language ideologies. In Western educational contexts, assessment is often implemented as a tool to evaluate, rank, and label students. Standardized exams "normalize some content as 'correct'" (Limerick 2020: 288), thereby imposing rigid definitions of what counts as knowledge and who is considered knowledgeable of the language. In RSC, Usage Practice and Tests allowed for only one correct answer. Language became "correct" or "incorrect" based on whether it conformed to the Munro & Willmond (1994) orthography and a particular set of grammar "rules" taught in the course.

This is at odds with Chikasha relational epistemologies because the standardization of the language erases some anompí'shi' and relationships learners may have to them. Learners' knowledge was reduced to a score provided at the end of the assessment. In Chikasha and other Indigenous epistemologies, knowledge is held within relationships (Wilson 2008). As Gamilaroi scholar Michelle Bishop (2020) explains, "you may not recall everything, but once you are in relationship, it's all there. You remember together" (140). To revitalize and reclaim Chikashshanompa', anompí'shi' and anompa shaali' must remember together, through language, what it means to be in good relation and thus how to maintain the "heartbeat of [our] existence" (Elliot-Groves et al. 2020: 163). The Rosetta Stone interface does not in itself support this need as it emphasizes the individual rather than "the communal […] forms of communication in which people engage and learn" (Limerick 2020: 287). Whereas Chikasha models of learning are always relational, the Usage Practice and Tests can be isolating and discouraging to learners.

Still, it is important to recognize that while assessments in RSC were completed by individuals, relationships are still present albeit obscured. For example, our team created all Usage Practice and Test content. No one on our team is perfect, so there are instances where we may have created a confusing question or gotten something wrong. Learners tend to assume, however, that the answer generated by the RSC interface is always correct. This can create a concerning situation where learners are unable to see the technology as human-created and feel a sense of failure (de Bruin & Mane 2016). In one example, Indigenous language learners relying on technology and multimedia experienced an increase in anxiety when they struggled in their learning. They blamed themselves rather than the shortcomings of the technology, resulting in an internalized sense of failure (de Bruin & Mane 2016). Relationality is vital to ensuring the well-being of those involved in online language education because this internalization of failure could have been avoided if course creators and learners viewed themselves as being in relationship not to the computer but to each other, in the context of online Indigenous language learning spaces.

One strategy that we developed over time was to re-envision the Usage Practice and Tests. While we could not change the RSC interface to add activity types or remove percentage scoring, we had full control over the content of Usage Practice and Tests. For the storytelling lessons in Levels 2, 3, and 4, we decided to model our approach to reflect Teaching Proficiency through Reading and Storytelling circling

techniques, in which a language teacher asks a series of questions in the target language about a statement in the language. For the Usage Practice, we recorded audio of short segments of the story and then asked a series of questions to help learners check their comprehension of key details. We did the same for the Tests but made questions more challenging by asking about longer segments of audio. The Usage Practice and Tests then contributed to a goal of helping learners to fully understand the story and to work toward being able to retell it in their own Chikashshanompa' words. This re-envisioning of Usage Practice and Tests facilitated a relational practice of supporting learners to share their knowledge of the language and culture with others.

7. Closing reflections When we began the RSC project in 2015, there were very few examples of online Indigenous language courses developed by Indigenous communities and, specifically, courses developed in ways that centered Indigenous epistemologies. Further, research about CALL to support ILR was sparse. With support from the Chickasaw Nation and Rosetta Stone, our team created an online course for Chikashshanompa' by learning as we went along. Over the past six years, we have gained knowledge and experience, developing our own methodology guided by Chikasha relational epistemologies. In these closing reflections, we return to our guiding questions, offering our reflections and encouragement to others who may undertake similar work. We hope that ideas we share will have relevance to others who are working on Indigenous language CALL courses, regardless of the platform they are using.

7.1 What relationships are required to create an online Indigenous language course? RSC grew out of what Chew et al. (2021: 334) describe as the "web of interrelated relationships" required to advance language work. The three authors, with Marion Bittinger from Rosetta Stone, comprised a core team responsible for developing content for RSC. Each of us brought unique skills, talents, and perspectives to the project, yet our team alone could not create RSC. In the six years we have worked together on this project, we have worked to be in good relationship to each other, Chickasaw Nation leadership, other Rosetta Stone employees we work with, and, importantly, anompí'shi', anompa shaali', and the Chikasha community broadly. We are grateful to the many people who have contributed to RSC in many ways. For Indigenous communities planning to create an online course for their language, it is important to consider whether there is a good relationship with the technology provider and whether members of the community are supportive of the course and willing to share in the work of creating it.

7.2 How do people create and strengthen relationships in online education spaces? When we first began the RSC project, we anticipated that the online course would be used exclusively to support language learners to study Chikashshanompa' in an asynchronous, self-paced format. Prior to the release of RSC, Chickasaw citizens, especially citizens-at-large, were creating Facebook groups and other online spaces to connect around shared goals of learning Chikashshanompa' (see Chew &

Hinson 2022). Many of these learners purchased and studied from a hard copy of the Munro & Willmond (2008) grammar book, which is a useful tool for language learners but not designed to support language acquisition. With the release of RSC, some study groups shifted to work through the online courses together. For Kari, RSC was a valuable resource for family language learning and teaching during the COVID-19 pandemic (see McIvor et al. 2020). She and her mother, a new language learner, met regularly to go through lessons together and practice speaking. While some used RSC independently, what we began to see was many people creating community around RSC by studying together in online synchronous environments (Chew & Hinson 2022). This was a use of the course that we had not anticipated. At the same time, initial observations and feedback indicate that those who use the course in community feel more supported in their learning journey and are gaining more proficiency in the language than those who study in isolation. The way that people use online Indigenous languages courses and how these courses support their language journey is an area that would benefit from additional research. For those working to create an online Indigenous language course, it may be beneficial to consider what supports will be created and put in place for learners who desire to create online communities with other language learners and speakers.

7.3 How can online language work be re-emplaced in off-line relationships? A key goal in developing RSC is to support learners to use the language off-line as well as in home, community, work, and school settings. It can seem counterintuitive to invest time and resources into online language education if the end goal is to sustain the language off-line. In the context of Chikashshanompa' revitalization, where there are not enough Elder anompí'shi' to meet the language education needs of thousands of language learners, RSC has been an invaluable tool.

Chickasaw Nation employees and leaders use RSC to study independently and then gather for meetings with Lokosh to ask questions about lessons and practice using the language they learned. Similarly, learners in the Chikasha Academy adult immersion program (see Morgan 2017; Hinson 2019) study independently in RSC, meet forty hours a week for intensive immersion conversation sessions, and then eventually participate in intensive language immersion sessions with anompí'shi'. By using RSC, beginning learners can gain a strong foundation in the language and be in a better position to benefit from time with anompí'shi'. In turn, anompí'shi' can focus more of their efforts on increasing the proficiency of more advanced learners who are ready to move beyond the content of RSC. This is especially important in situations where there are fewer language anompí'shi' than new learners.

Currently, Kari is working on a project to develop a high-school-level curriculum for Chickasaw Level 1 and Level 2 that complements RSC. The curriculum is designed so that anyone can teach the courses, regardless of their language proficiency. Students in the courses study from RSC and then participate in interactive activities that build on RSC content. During the 2021–22 school year, Chickasaw Level 1 was piloted at Byng High School in Byng, Oklahoma. The teacher was Delaney Lippard, a non-Indigenous educator who has studied the language and maintains a strong relationship to Chikasha okla. Initial interest in the course exceeded expectations.

Ms. Lippard taught two sections of Chickasaw Level 1 to thirty-two total students. Chickasaw Level 2 will be piloted during the next school year. The goal of the courses is to support Chikasha and other students to learn the language and to consider college and career paths related to language revitalization.

Ultimately, we hope that RSC will continue to bring Chikasha okla together toward a future in which Chikashshanompa' ilooanompoli (we all speak Chickasaw).

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