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# Revitalise an Endangered Language and Writing Via Mooc: What and How

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## Abstract:

The Dongba script, recognized as a UNESCO Memory of the World in 2003, is considered the world's last living pictographic writing system but remains critically endangered. In response, the Institut National des Langues et Civilisations Orientales (Inalco), the University of Geneva (Unige), and Beijing Language and Culture University (BLCU) collaboratively developed a MOOC to revitalize the script. Offered in four languages, the course teaches 300 high-frequency Dongba characters and incorporates "graphoculture" to highlight cultural contexts. During its first launch in 2023, the MOOC attracted over 2,000 participants from 80 countries, with 234 earning completion badges. This article examines the course's design, learner engagement, and its impact on endangered language preservation. It explores whether MOOCs can contribute to revitalizing endangered writing systems and identifies key design factors influencing learner experience. The paper argues that MOOCs can function not only as educational tools but also as research platforms for digital heritage preservation.

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**Keywords:** MOOC, endangered language, Dongba script, Naxi culture, cultural heritage preservation, language teaching, pedagogical design.

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## 1. Introduction

The Dongba script, used by the Naxi people in northwestern China, is often described as the world's "only living pictographic script," still used mostly in religious rituals. Despite its 2003 UNESCO Memory of the World designation, the script faces extinction. Traditionally confined to priests, the script doesn't consistently represent the spoken language (Naxi language) and incorporates mnemonic devices, rebuses, and phonetic pictograms, making interpretation challenging without expert guidance. With fewer than 350 active users, the script is critically endangered.

Conventional preservation efforts have largely confined the Dongba script to museums and folkloric displays rather than encouraging active use. As Poupard (2019) notes, these approaches risk creating a "cultural living death" where the script is preserved but disconnected from actual use. To ensure its survival, younger generations must be engaged in revitalization.

To address this challenge, the Institut National des Langues et Civilisations Orientales (Inalco), the University of Geneva, and Beijing Language and Culture University (BLCU), with UNESCO's support, developed the "Initiation to the Dongba Script" MOOC (hereafter the Dongba MOOC). This initiative combines script acquisition with cultural context, offering interactive learning beyond passive preservation.

Beyond serving as an educational tool, this project explores the broader role of digital platforms in language preservation. Specifically, it examines two questions:

- Can a MOOC contribute to the revitalization of an endangered writing system?
- What key design factors shape the effectiveness of such a course from the learner's perspective?

As MOOC designers, we address the first question through purposeful course design supporting active script transmission, while gathering learner feedback to inform refinements for the second question.

## **2. Why a MOOC ?**

The rise of MOOCs has influenced education by offering accessibility, scalability and interactive learning. More than a decade after their inception, MOOCs have expanded into language learning (Martín-Monje, E., & Bárcena, E., 2015; Jitpaisarnwattana, N., Reinders, H., & Darasawang, P., 2019). Unlike traditional preservation methods, MOOCs allow for global participation and hands-on engagement. Their massive dimension, reflected in their large reach, diverse participant profiles, and active learner engagement, enhances knowledge dissemination and fosters a dynamic learning community. This dimension is crucial for the revitalization of endangered scripts.

Initiatives such as the Yup'ik Language and Culture course (edX, University of Alaska Fairbanks), Exploring Afrikaans Language and Culture (edX, Stellenbosch University) and Les hiéroglyphes égyptiens (FUN, Université de Liège) demonstrate both the potential and the challenges of using MOOCs to preserve cultural heritage. Based on these examples and our previous experience with language-related MOOCs, we believe that MOOCs can effectively contribute to the preservation of the Dongba script. However, challenges in their pedagogical design need to be addressed in order to maximize their impact.

## **3. Insights from the Chinese Introductory MOOC**

The Dongba MOOC draws on insights from our experience with the Chinese Introductory MOOC (FUN, Inalco), particularly in teaching non-alphabetic scripts. Despite their distinct historical contexts, Dongba pictographs and the Chinese writing system share structural similarities (Milnor, 2005), allowing us to apply key principles from Chinese as a Second Language (CSL) didactics (Bellassen, J., 2010; Gong, Y., Lyu, B., & Gao, X., 2018).

The design of the Dongba MOOC is inspired by the Dualism-Based Teaching Method (Bellassen, J., 1989; Wang-Szilas & Bellassen, 2017), which was successfully implemented in the Chinese Introductory MOOC. This approach views characters as independent carriers of meaning rather than mere phonetic transcriptions. It emphasizes high-frequency characters as foundational elements, systematic visual recognition, and cultural contextualization. Additionally, by focusing on the visual identification of graphical elements, this method enhances character memorization, making it particularly suited to the pictographic nature of the Dongba script.

Research on Dongba scripts provides a foundation for developing a pedagogical corpus for the MOOC. Naxi scholar Fang Guoyu (1995), author of *Naxi Xiangxing Wenzipu* (A dictionary of Naxi pictographic characters), classified Dongba characters into ten categories, including basic pictographs, ideograms, and phono-semantic compounds. Recent advancements, such as Unicode encoding (Hohhot meeting, 2017) and the Pangloss Project's Naxi language audio database of the LACITO (Langues et Civilisations à Tradition Orale), further support digital representation and pronunciation resources. Collaboration with Dongba priests, teachers, and researchers ensures a solid foundation for building an introductory-level corpus.

## **4. Design of the Dongba MOOC**

The Dongba MOOC consists of seven modules (Figure 1). Module 1 serves as an introduction, while Modules 2–7 follow a structured format with five sequences each. Sequences 1–4 focus on character learning, guiding learners through a pictographic writing logic, as shown in the horizontal menu. Sequence 4 serves as a summary exercise to reinforce learning. Sequence 5 explores cultural aspects and includes forum discussions to foster community engagement. Each module concludes with a quiz, and learners who successfully complete all modules earn a badge.

7 Modules (in four languages)

Module 1. Introduction

Module 2. Family and Community

Module 3...

Module 4...

Module 5...

Module 6...

Module 7...

## 5 Task-based learning sequences

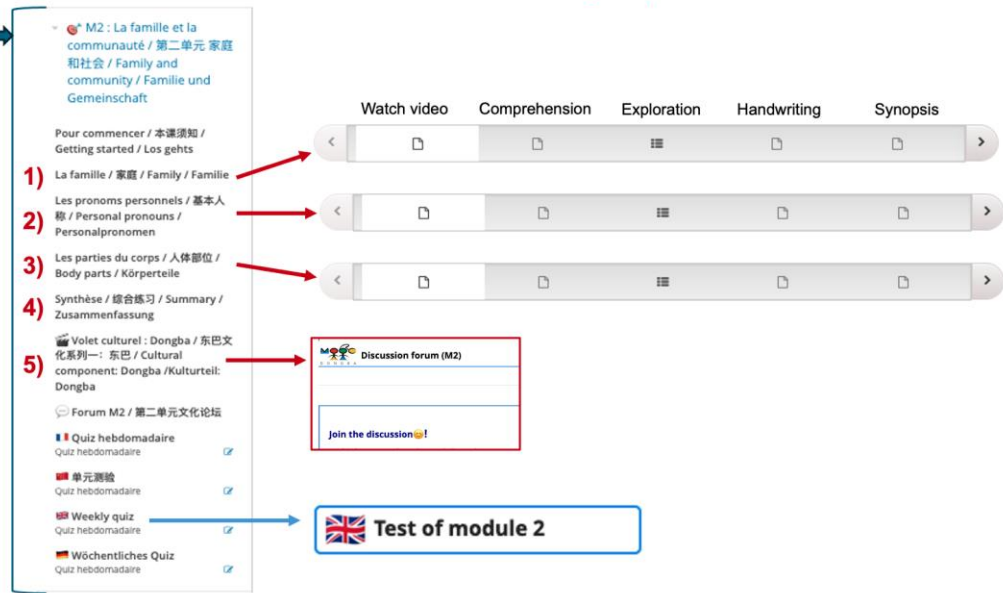


Figure 1. The Dongba MOOC's course plan.

Key design principles are presented as follows:

### Separation of Oral and Written Language


The MOOC focuses on literacy in Dongba writing rather than spoken Naxi, reducing cognitive load and ensuring accessibility.




### Economy and "Threshold Level" Approach

Inspired by the Threshold Level framework (Van Ek, 1975; Council of Europe, 2001) and the principle of economy ("less is more") (Ellis, 1997), the course optimizes learning by focusing on a core set of 300 essential characters. This selection ensures learners gain a functional grasp of the script, fostering confidence without overwhelming them.




### Character Selection




- **Simplicity and Combinability:** Focuses on basic characters that serve as building blocks for compound characters. This approach introduces learners to the logic of Dongba character formation,


promoting both understanding and creativity. For example, the character  (man, husband, son)

serves to learn characters such as  (woman, wife, daughter),  (father),  (mother), etc.






- **Meaning-Linked Forms:** Emphasizes pictograms and ideograms with clear visual representations, making them easier to understand and remember. This selection fosters a more intuitive learning

experience. For example, the pictograms as  (sky),  (sun),  (moon),


 (cloud), etc., are used to form the ideograms as  (sunny day),  (cloudy day),

 (light).

- **High Frequency:** Selects commonly used characters to ensure practical relevance.
- **Graphic Families:** Groups visually similar characters to reinforce pattern recognition. For instance, a single base character might serve as the root for multiple compound forms, as shown in the table below.

				
man	I, me	sitting	jumping	dancing

- **Cultural Significance:** Integrates characters central to Naxi traditions, beliefs, and daily life. For

example, the symbol  shows a seated priest (Dongba) wearing the sacred 5-lobed headdress (only 3 lobes are represented in the Dongba symbol) and reciting the Dongba classics.


### Learning Activities


The course takes inspiration from Diana Laurillard's six learning activities (2018) for structured, autonomous learning, with certain adaptations:


- Watch & Read: Introduces basic characters through videos and readings.
- Comprehension Exercises: Reinforces recognition through matching activities.
- Watch& Explore: Presents compound characters, prompting learners to deduce meanings.
- Practice Handwriting: Allows learners to replicate characters, emphasizing memorization over strict orthography.
- Collaboration: Promotes interaction between learners and the tutors.
- Assessment & Badging: Learners complete quizzes and receive badges for progress.

### Embedding Cultural Knowledge

- Graphoculture: Examines the cultural significance of individual characters, such as the symbol for milk

churns , a key element of Naxi cuisine. It represents a churn used for yak butter tea, an essential part of daily life for the Naxi people.

- Naxi heritage: Highlights important traditions, such as sacred places (e.g.,  Jade Dragon

Mountain, the sacred mountain of the Naxi people) and marriage rituals (e.g.,  the statue of a Dongba anointing butter on the foreheads of newlyweds).

### Learning Community

To enhance engagement, the MOOC includes multilingual tutoring, with a team of doctoral researchers and experts providing support in French, Chinese, English, and German.

## 5. First Launch and Results

The Dongba MOOC, launched from April 24 to June 26, 2023, attracted over 2,000 learners from 80 countries, with France having the highest enrollment (65.36%). Other participants came from China (5.91%), Switzerland (2.36%), Belgium (2.17%), Germany (1.47%), and several other countries, including the U.S., Spain, Italy, Canada, Morocco, and Japan. Of the 2,039 enrolled learners, 503 completed the first quiz and were considered active students (Celik & Cagiltay, 2024). By the end of the session, 234 completion badges were awarded, representing a 47% success rate, which is quite high compared to the average for standard MOOCs.

## 6. Data Collection and Analysis

The high success rate of the MOOC suggests strong learner engagement. However, do participants believe that a MOOC can contribute to the revitalization of the Dongba script? What are their views on the course design, particularly regarding the separation of spoken and written language, the participatory activity, and the multilingual interface? And do they continue using the Dongba script after completing the MOOC?

To address these questions, we analyzed data collected from:

- Two questionnaires: a Pre-MOOC and a Post-MOOC questionnaire, both including a standard set of questions from the French MOOC Platform France Université Numérique (FUN), along with 5 additional questions proposed by the designers.
- Forum discussions
- Email exchanges, LinkedIn posts, and other participant interactions.

### *Analysis of the Pre-MOOC and the Post-MOOC Questionnaires*

The Pre-MOOC questionnaire received 396 responses (19.4% response rate) from 2,039 registrants. Participants were mostly female (74%), highly educated (48% with master's degrees, 15% with doctorates), and professionally active (52% working), aged 17 to 88. Most were native French speakers (80%) with prior MOOC experience (72%). The Post-MOOC questionnaire received 196 responses, with 188 participants earning certificates, representing 80% of the 234 certificate recipients. The analysis focuses on the additional questions included in both the Pre-MOOC and Post-MOOC questionnaires.

The five additional questions in the Pre-MOOC questionnaire assess participants' prior knowledge, attitudes, and motivations regarding language and writing systems. The five Post-MOOC questions evaluate how the course has impacted their views on language learning and revitalization. The table below illustrates the connection between these Pre-MOOC and Post-MOOC questions, providing a framework for addressing the research questions in this paper.

**Table 1:** Connection Between Pre- and Post-MOOC Questions

Category	Pre-MOOC Question	Post-MOOC Question	Connection
<b>Knowledge and Prior Experience</b> —Continued <b>Interest/ Motivation</b>	Q1: Do you know any writing systems other than your own?	Q1: If a MOOC on the Dongba script is offered in the future, would you consider enrolling?	Examines whether prior exposure to multiple writing systems and multilingualism influences continued interest in both the Dongba script and the Naxi language.
	Q2: Apart from your mother tongue, do you speak any other languages?	Q2: Would you like to learn the Naxi language?	Investigates whether learning the Dongba script encourages learners to study the Naxi spoken language, considering if the unique features of the script stimulate interest in oral language acquisition.
<b>Motivation</b> → <b>Future</b>	Q3: What motivated you to	Q1: If a MOOC on Dongba script is offered in the future,	Learners' initial motivations provide insight into their likelihood of continued

<b>Engagement</b>	take this MOOC?	would you consider enrolling?	engagement, helping assess the MOOC's impact on sustaining interest in Dongba script.
<b>Conceptual Understanding Perception Change</b>	Q4: Can a language be approached solely through one of its two forms, oral or written?	Q4: After following this MOOC, has your perception of what constitutes a language changed?	The Pre-MOOC question assesses participants' views on spoken and written language, while the Post-MOOC response evaluates the MOOC's impact on their perspective.
<b>Utility Perception → Value for Preservation</b>	Q5: Do you think learning a rare language is useful?	Q3: Do you think universities need to offer the teaching of rare languages? Q5: Can a MOOC be useful for the maintenance and preservation of an endangered language and culture?	The Pre-MOOC question identifies learners' initial views on rare languages. The Post-MOOC responses reveal whether the course reinforced their belief in the value of endangered language preservation and the role of universities in supporting such efforts.

### **Knowledge and Prior Experience –Continued Interest/ Motivation**

In Pre-MOOC Q1 (Do you know any writing systems other than your own?), all 396 respondents answered "yes." The most cited were Chinese/Kanji (88 respondents), followed by Russian/Cyrillic (44) and Japanese (42). Other frequently mentioned scripts included Arabic, Hebrew, Greek, Korean, and, less commonly, Sanskrit and ancient scripts such as Egyptian hieroglyphics, Yi, Manchu, Mayan, and runes.

For Pre-MOOC Q2 (Do you speak any languages other than your native language?), all 396 respondents again answered "yes." English was the most widely spoken second language (86.11% of respondents), followed by Spanish, Chinese, German, and French, each spoken by roughly a quarter of participants. Additionally, 28.03% reported proficiency in other languages, including Russian, Korean, Dutch, and Arabic, among others.

These responses indicate that participants possess diverse linguistic knowledge and are highly multilingual, forming a group well-versed in linguistic and textual diversity.

For Post-MOOC Q1 (If a MOOC on Dongba script is offered in the future, would you consider enrolling?), 92% of respondents said "yes." In Post-MOOC Q2 (Would you like to learn the Naxi language?), 75% expressed motivation to do so.

Given that the Naxi language is also endangered, this raises an important question: Can the Dongba MOOC contribute to a broader revitalization of Naxi beyond preserving the script? One possible approach is to use the MOOC as a gateway to spark interest in learning Naxi. If more people—especially those outside the Naxi-speaking community—engage with the language, this external interest could, in turn, encourage greater enthusiasm among Naxi speakers, ultimately supporting its preservation and continued use.

### **Motivation –Future Engagement**

The analysis of Pre-MOOC Q3 (What motivated you to take this MOOC?) supports this conclusion. Most participants enrolled in the MOOC for the joy of learning (84.09%), with a specific interest in the topic motivating over half of the respondents (53.79%). When asked about their particular interest in Dongba, the originality of the writing system was the main attraction for 87.37% of participants, followed by curiosity about ethnic customs (55.81%) and a desire to compare Dongba with other writing systems (36.36%).

### **Conceptual Understanding –Perception Change**

The responses to Pre-MOOC Q4 (Can a language be approached solely through one of its two forms, oral or written?) were divided. Half of the respondents (50%) believed that oral and written language are interconnected and essential for a complete understanding of grammar, vocabulary, and cultural context. The remaining 25% of respondents thought that it was possible to learn a language through only one form, citing examples like Latin, where the written form is dominant, or languages like Farsi, where the writing system does not always directly reflect spoken language. Several participants also pointed out that, in the digital age,

written language often enables communication without speech, such as through Edongba (a software program developed to facilitate the digital input of Dongba scripts, Yang, 2001), making written-only learning more relevant for some languages.

For Post-MOOC Q4 (After following this MOOC, has your perception of what constitutes a language changed?), responses were nearly split, with 47% reporting a shift in perspective and 53% stating that their understanding had not changed. Those who did not experience a change typically had prior experience with diverse writing systems. However, those who did note a change in perception highlighted several key insights, such as:

- recognizing Dongba as a memory aid rather than a direct representation of speech,
- appreciating pictographic communication as a distinct form of language,
- understanding the deeper connections between language, culture, and religion.

### **Utility Perception →Value for Preservation**

Regarding Pre-MOOC Q5 (Do you think learning a rare language is useful?), 77% of participants affirmed the value of rare languages, citing cultural preservation, cognitive benefits, and exposure to alternative perspectives. Some also challenged conventional definitions of “utility,” comparing linguistic diversity to biodiversity and emphasizing the responsibility to preserve cultural heritage.

For Post-MOOC Q3 (Do you think universities need to offer the teaching of rare languages?), 96% of participants supported university involvement, recognizing the role of higher education in cultural preservation, intellectual enrichment, and fostering diverse worldviews. While most saw universities as essential for this mission, some suggested that specialized institutions might be better suited.

For Post-MOOC Q5 (Can a MOOC be useful for the maintenance and preservation of an endangered language and culture?), 96% of participants believed MOOCs could contribute to language preservation. They highlighted benefits such as:

- Raising global awareness about endangered languages
- Providing accessible education to diverse audiences
- Motivating native speakers to value their linguistic heritage
- Creating comprehensive digital documentation
- Inspiring deeper study of endangered languages

One participant encapsulated this idea: "On ne protège que ce qu'on aime, et on n'aime que ce qu'on connaît" (We only protect what we love, and we only love what we know).

Overall, the Post-MOOC responses reinforced the participants' belief in the importance of endangered language preservation and the potential role of both universities and online education in this effort.

### ***Key Insights and Participant Engagement Beyond the MOOC***

In addition to the questionnaire results, we observed participant engagement beyond the MOOC.

#### **Participatory Task Engagement**

In the forum, learners were encouraged to take part in a hands-on activity. The aim was to link online learning with real-world engagement (see Figure 2).

## Mission: A la recherche de manuscrits Dongba / Mission: Searching for Dongba scriptures / 学习任务：寻找东巴经 / Mission: Auf der Suche nach Dongba-Manuskripten

Poster une réponse

Hello Everyone,

After several weeks of study, you learned that the Dongba scriptures are the classics of Dongba religion, a primitive religion unique to the Naxi people. It records philosophy, history, religion, astronomy, folklore, literature, medicine, and other disciplines. These scriptures are the encyclopedia of Naxi people. Nowadays, there are over 40,000 volumes of the existing Dongba Classic, including more than 1,000 different categories. In addition to the scriptures collected in Chinese domestic museums and by private collectors, a large number of Dongba scriptures are scattered all over the world.

The MOOC team would like to invite everyone to join in the mission of finding the Dongba scriptures. Let's try to find collections or presentations about the Dongba scriptures in museums, libraries, or websites in your country, your city, or even in a flea market, and then, you can share your discoveries in this discussion.

We hope that with your participation, more people will have the opportunity to see different Dongba scriptures or receive information about the collection of Dongba scriptures.

We look forward to your sharing!

MOOC team

**Figure 2.** Screenshot of the mission description from the MOOC interface on the FUN platform.

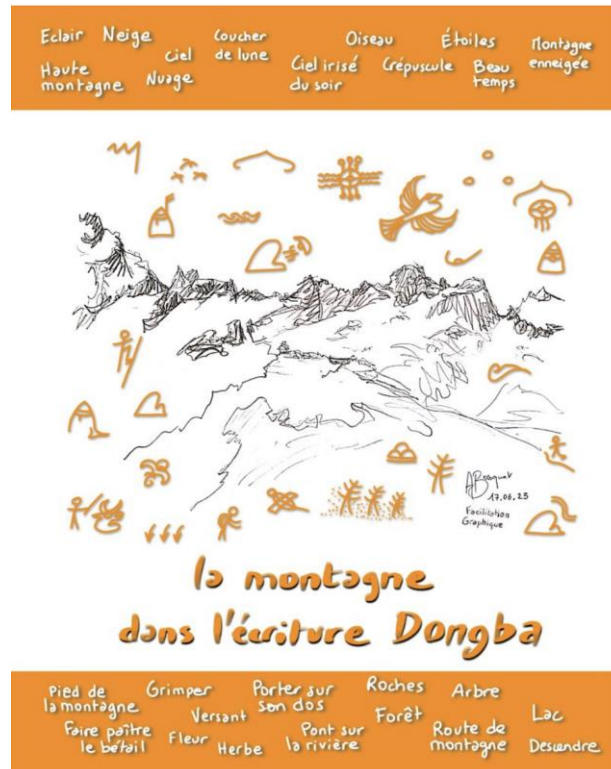
Participants actively contributed to Dongba script preservation by documenting manuscripts and artifacts. One participant in Paris discovered a Dongba manuscript at the Musée Guimet, while another identified Dongba artifacts in a private collection and provided photographs. Several others reached out to regional museums to inquire about potential holdings. Although engagement was primarily from French-speaking participants, some contacted the authors via email to share personal collections and request script interpretations.

### **Academic Research and Further Studies**

Two students at the University of Geneva wrote their Master's theses on the Dongba script. Some participants expressed interest in studying in Lijiang, where the script is used by the Dongba priests.

### **Creative Artistic Applications**

Some graphic designers have incorporated the Dongba script into their work. As shown in Figure 3, one participant shared her design using the Dongba script she learned in the MOOC.



**Figure 3.** Screenshot of a participant's design work from the Dongba MOOC.

These cases suggest that the MOOC not only promoted learning but also inspired real-world applications as well as deeper and sustained engagement with the Dongba script.

## 7. Reflections and Prospects

This Dongba MOOC highlights the potential of MOOCs as an effective tool for revitalizing endangered writing systems. Our analysis reveals several key aspects and prospects.

### *The Combination of XMOOC and CMOOC*

The Dongba MOOC integrates both XMOOC (eXtended MOOCs) and CMOOC (Connectivist MOOCs) approaches. XMOOCs focus on traditional knowledge delivery through structured content, such as course videos, quizzes, and assignments, while CMOOCs emphasize learner-driven connections and collaboration (Downes, S., & Siemens, 2013). This hybrid design offers:

- XMOOC elements: Structured modules, clear learning objectives, and formal assessments.
- CMOOC elements: Collaborative forums, peer learning, and participant-driven research tasks.

This combined approach provides learners with essential knowledge about the Dongba script while also promoting community building and knowledge co-creation. The success of this integrated model depends on factors such as cultural relevance and resource availability to support collaboration.

### *The Participatory Task: Sustaining Engagement Beyond the MOOC*

The participatory task in the Dongba MOOC redefines traditional pedagogical "tasks" by applying an action-based approach to online language learning. Participants were encouraged to identify and describe Dongba manuscripts in their countries, transforming the task into a real-world activity connected to the preservation of Dongba manuscripts. This task serves as a form of crowdsourcing or citizen science, where learners actively participate in knowledge production. By engaging a global community, it helps promote the documentation and preservation of endangered languages and cultural heritage.

However, sustaining learner engagement beyond the course is a critical consideration for the success of the MOOC. The platform successfully attracted a linguistically and intellectually sophisticated audience, with many participants holding advanced degrees. Despite this, maintaining engagement across a diverse learner base—especially those with less formal training—remains a challenge. To ensure long-term participation, future iterations of the course should:

- Develop advanced modules for continued learning.
- Implement collaborative translation projects.
- Create regional learning communities.
- Establish connections with Naxi communities.

In addressing engagement, one of the key challenges lies in balancing interactivity with scalability. While interactive elements such as peer-reviewed tasks, discussion forums, and collaborative projects are essential, they require careful facilitation and clear community guidelines to maintain effective participation. Additionally, dropout rates—common in MOOCs—can be mitigated by improving onboarding processes, incorporating structured progress tracking, and offering timely feedback.

Some participants requested features such as live Q&A sessions, group projects, and pronunciation support, which are proven to enhance learner retention in other language MOOCs. These suggestions align with the need for an interactive and personalized learning environment, which can make the course more engaging for a broader audience.

By comparing the Dongba MOOC with other digital language revitalization efforts—such as those for Hawaiian, Māori, or Scottish Gaelic—we can contextualize its success and identify areas for improvement. These programs also focus on community-based learning and digital platforms but differ in terms of the role of native speakers, instructional design, and engagement strategies. Incorporating best practices from these initiatives could strengthen the Dongba MOOC's effectiveness and its ability to engage a wide range of learners.

### ***Establishing a Specialized Research Community Through the MOOC***

Of the 396 responses from the pre-course questionnaire, approximately 60 participants hold doctoral degrees, and the depth and professionalism of their answers demonstrate the platform's potential for research engagement. The MOOC platform could serve not only as a learning environment but also as a potential research hub, facilitating communication and collaboration among researchers.

Moving forward, we can enhance these exchanges by:

- Creating specialized research discussion forums
- Facilitating collaborative research projects
- Hosting virtual conferences on endangered language preservation
- Developing AI-powered chatbots to provide real-time expert support for all learners

## **8. Conclusion**

Our findings strongly affirm that MOOCs can contribute to endangered writing system revitalization. The high completion rate (47%), sustained engagement, and overwhelming participant belief (96%) in MOOCs' potential for language preservation validate this approach. Several critical factors are identified and recognized:

- Focus on high-frequency characters (pedagogical economy)
- Integration of cultural context (graphoculture)
- Separation of written and oral language to reduce cognitive load
- Real-world application through citizen science
- Multilingual interface accessibility

Participants - a linguistically sophisticated group with knowledge of multiple writing systems - showed remarkable engagement, with 92% expressing interest in future Dongba courses and 75% motivated to learn the Naxi language itself. This suggests the MOOC could serve as a gateway to broader language revitalization, potentially generating enthusiasm among native Naxi speakers.

Participant feedback for improvement included clearer instructions and community guidelines, progress tracking, audio recordings for pronunciation, sentence-building exercises, handwritten character submission capabilities, and advanced courses with interactive elements like live Q&A sessions and group projects.

Future research should focus on the effectiveness of interactive learning and integrating online with offline community engagement. Challenges remain in balancing interactivity with scalability and adapting to different linguistic contexts. Expanding this approach to other endangered languages could provide further insights while contributing to broader digital heritage preservation efforts.

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