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GlobalVoices

Digital initiatives for Indigenous languages

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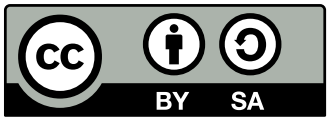

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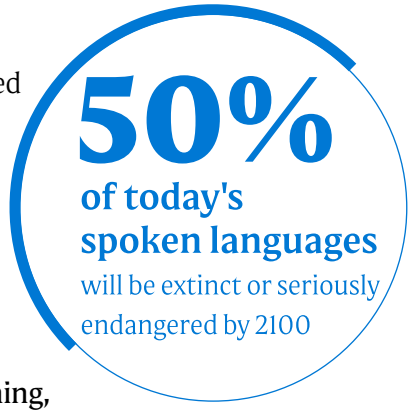
SHORT SUMMARY

Creating digital futures for Indigenous Languages

Supported by UNESCO and Global Voices' Rising Voices (RV), this toolkit extends the efforts of dedicated Indigenous digital practitioners. It illustrates how internet and other digital tools can be utilized to conserve, revive, and promote Indigenous languages, as well as other marginalized or minority languages.

This toolkit has been co-designed in close partnership with both established and emerging networks of Indigenous digital practitioners, language advocates, and collaborators, within the framework of the **International Decade of Indigenous Languages 2022-2032.**



The toolkit promotes the foundation of language preservation, revival, and promotion on eight key approaches:

Facilitating, Multiplying, Normalizing, Educating, Reclaiming, Imagining, Defending and Protecting.

It also offers a curated list of valuable resources, including guides, tutorials, and manuals for utilizing digital tools. In conjunction with the advisory group established for the toolkit's preparation and other collaborating organizations, it presents a wealth of inspiring stories showcasing innovative projects that have made a significant impact on languages at local, national, or global levels.

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"Since wars begin in the minds of men and women it is in the minds of men and women that the defences of peace must be constructed"

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GlobalVoices

Digital initiatives for Indigenous languages

Contents

Executive Summary

Supported by UNESCO and Global Voices' Rising Voices (RV), this toolkit builds upon the work of engaged Indigenous digital practitioners, showing Indigenous language users how internet and social media tools can be harnessed for the preservation, revitalization and promotion of Indigenous languages, or other under-resourced or minority languages. Both Organizations are strongly committed to the protection, support and promotion of Indigenous languages online, as well as to continue to provide critical capacity-building to equip Indigenous peoples with the tools, resources, and skills for implementation of their own digital campaigns and projects.

The toolkit will not be a step-by-step guide; rather, it provides a roadmap for digital engagement co-designed in close collaboration with existing and new networks of Indigenous digital practitioners and language defenders and promoters and other partners in the context of the International Decade of Indigenous Languages 2022-2032.

The development phase of the toolkit provided a unique opportunity for partner organizations to learn from and co-design alongside extensive global networks of Indigenous digital practitioners. The toolkit encouraged language defenders and promoters to build their work on eight key approaches for the preservation, revitalization and promotion of languages. It also includes a selection of existing resources, such as high-quality guides, tutorials, and manuals on the use of the digital tools. In partnership with the advisory group established for the preparation of the toolkit and other partner organizations, the toolkit also provides a large number of inspiring stories of innovative projects that have demonstrated an impact on languages at a local, national or global level.

Finally, the toolkit is openly licensed as an Open Educational Resource. It is expected that the toolkit will continue to evolve and grow as the needs of language users and digital language defenders and promoters change alongside the introduction of new technological solutions, innovation and creativity.

CHAPTER

1

Introduction

Introduction

Le ju'un je'ela' u nu'ukul meyaj ti'al u yáantik le máaxo' túun meyaj wáa taak u káajsik meyaj u muuk'ankunsik u máasewáal t'aan tu yóol iik' wáa yéetel u nu'uklo'ob díijital. Le ju'una' u xak'altike ba'ax ku beetik men uláak' máako'obo' yéetel ku tsolxikintik bix u páajtal u ts'aik ojéetbil máasewáal t'aano'ob tu yóol iik'. Junp'éel ba'al jach k'a'anáan bix u tso'olol meyaj yéetel u nu'ukul díijital ti'al u náajaltik le ba'ax u sits'tiko' maas séeban. Le ju'una' láayli' ku tsolxikintik bix u p'i'isil meyaj ti'al u yila'al wáa ma'alo'ob bix u beetike'.

[Translation from *Maayat'aan,* or Maya language, mother tongue of the author]

This toolkit intends to serve as an aid for people who are currently engaged in (or want to start working in) the promotion and strengthening of their languages in cyberspace or with the use of digital media and technologies. It offers analytical and practical tools to increase the presence of Indigenous languages online. It also suggests ways to estimate and improve the impact of the activities carried out by language defenders and promoters.

Goals and objectives of this toolkit

This toolkit aims to provide conceptual, methodological and practical tools for digital engagement with and in favour of Indigenous languages. It is based on the documentation and analysis of the work undertaken by several language defenders and promoters online or with the use of digital technologies to record, teach and share their languages. **Indigenous languages***, **minority languages*** and other **under-resourced languages*** are subject to displacement, especially in digital communication, media and technological innovation. This trend threatens to accelerate the loss of linguistic and cultural diversity in the world. The toolkit has been designed with this socio-political context in mind and seeks to highlight the opportunities that emerge from the work realized by grassroots organizations, academic networks and institutional collaborations to leverage the power of digital technologies for cultural diversity.

Some of the **objectives** of the toolkit are:

- To support and connect the efforts that Indigenous, minority and under-resourced language defenders and promoters carry out within the framework of the **International Decade of Indigenous Languages (2022-2032).**
- To present in a clear and practical way information that could be relevant to the work of language defenders and promoters, such as technological tools and resources, but also key deliberate steps to construct new projects.

Terms marked with an asterisk (*) are defined or explained in the Glossary.

- To reflect about the challenges that under-developed infrastructure, digital divides and technological inequalities pose to Indigenous, minority and under-resourced language communities and their aspirations for full social and political participation.
- To examine the possibilities and limitations of digital media and technologies to promote, teach, strengthen and protect Indigenous, minority and under-resourced languages, with special consideration to the context where these efforts take place.
- To identify the institutional and legal frameworks that protect and promote linguistic diversity in different regions and countries, and to highlight the ways in which they can be employed by language defenders and promoters to the benefit of indigenous communities.

Who is this toolkit for?

This toolkit is intended for Indigenous language defenders and promoters engaged in the revitalization or strengthening of their languages online or with the use of digital technologies.

More and more language communities recognize that incorporating **internet-based tools** and **digital media** can have a positive effect on the visibility of their language in digital spaces. As more examples of digital projects and campaigns continue to appear, they can serve as inspiration for other language communities to replicate or adopt these strategies for their own use. From this, questions may arise, as it can be overwhelming to choose from the many options available. They may ask which tool should be used or on which platform they should share their content.

However, engaging digitally with Indigenous languages has to do with more than simply choosing the right tool or platform. Those answers may only come after analyzing the objective, the intended audience, and the desired impact. In this toolkit, we explore these considerations through the notion of 'key approaches', which we will develop further below. These are also treated as '**tactics***' in other spaces where Indigenous digital practitioners converge. Most current or budding Indigenous digital practitioners know their own communities' needs and they are well-positioned to understand the context and the urgency for such crucial approaches.

Many of the tools described in this resource are primarily free-to-use, **open access*** or relatively easy-to-use since these are tools most readily available with lower barriers to participation. Other technologies such as **Natural Language Processing*** or **Artificial Intelligence*** often used in machine translation or **Automated Speech Recognition***, however, will not be covered here due to the specialized skill set required.

After reviewing the toolkit, it is expected that users will have the necessary knowledge and resources to choose the appropriate software, social media or activity which best corresponds to their objectives.

Background to the toolkit

This toolkit is based on an analysis of the projects and initiatives that defenders and promoters of different Indigenous languages in Latin America, North America, Africa and Asia-Pacific have carried out in the last decade. It is, at the same time, a summary of what they have achieved and a guide for future defenders and promoters of Indigenous, **minoritized*** and under-resourced languages. The toolkit concerns the work done by individuals and groups for the protection, promotion and transmission of their languages, either because they are considered to be endangered, or because they are in a disadvantaged position in relation to the main, official or national language(s). In certain contexts, the role of the digital language promoter (a sub-group within the larger community of language promoters and educators) is sometimes explained as that of somebody who "activates" their language online or using digital technologies.

The need for an instrument to support Indigenous language digital promoters was first established in UNESCO's *Recommendation Concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace*, adopted in 2003. The document highlights the importance that linguistic diversity in global information networks and **cyberspace** has for the future of freedom of expression, intellectual exchange and knowledge-based development and economies. It also notes that differential socio-economic development among nations and peoples influences the level of access and presence that their languages and cultural production enjoy in cyberspace and electronic communications. It recommends that all sectors of society should take measures 'to alleviate language barriers,' ensuring that all cultures, including those of Indigenous peoples, find expression in and access to cyberspace in all languages.

To this end, it advises, among other things, that national governments and international agencies work to 'encourage and support capacity building for the production of local and Indigenous content on the Internet' (UNESCO, 2003a: 2). This includes working on universal access to internet, language survival and mother tongue teaching in cyberspace, repositories of information in the public domain, software **localization***, digital translation services' 'intelligence linguistic systems' (or **artificial intelligence*** applied to language services), among other lines of action.

The Global Action Plan of the International Decade of Indigenous Languages (UNESCO, 2021b) recognizes the importance of digital empowerment, access to information, freedom of expression, media development, language technology and social organization in favour of languages. One of ten thematic outputs (no 3) is dedicated to the **establishment of the favorable conditions for digital empowerment, freedom of expression, media development, access to information and language technology, alongside artistic creation in Indigenous languages.** The Global Action Plan also defines three broad activities in this area, namely:

Activity 3.1. **Capacity building - among Indigenous Peoples, particularly youth, and professional organizations,** including those established by Indigenous Peoples themselves - in media and information literacy, digital and online engagement, digital skills relevant to the production and dissemination of appropriate content, tools and services respecting the principles of openness, interoperability, reusability, accessibility, and diversity (e.g. **Free and Open Source Software***, open educational resources, information and web accessibility)

Activity 3.2. **Development of professional competencies,** along with awareness-raising on the importance of Indigenous languages for reporting and for enhancing the profile of Indigenous Peoples and language users within the realm of media content, services and tools used by information and media professionals, including community media, reporters and journalists, archivists, curators, librarians and museum staff, as well as among language technology specialists, interpreters and translators, and those – including members of the judiciary – with responsibilities related to policy making, especially media self-regulatory and regulatory bodies, in order to achieve (i) better representation and portrayal of Indigenous Peoples and Indigenous language users in terms of content, editorial guidelines and in media operations overall; (ii) greater access to multilingual information and language technology, which will require the registration, integration and deployment of Indigenous languages in cyberspace (e.g. writing systems and symbols in the **Unicode standards***, font design and creation, keyboards and script adoption, major IT software applications, resting on open standards, Artificial Intelligence, Blockchain and other state-of-the-art technologies)

Activity 3.3. **Establishment of UN-system wide cooperation and public-private partnership mechanisms,** (i) promoting engagement and awareness-raising within the context of the World Summit on the Information Society (WSIS), the United Nations Group on the Information Society (UNGIS), community and public-private partnerships including with IT industry players, (ii) implementing normative instruments (e.g. UNESCO Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace, 2003); and (iii) developing appropriate guidelines and technical standards in cooperation with international standards organizations for language **digitization***, documentation, and innovation and knowledge through sharing good practices in the field of language technology, as well as (iv) involving Indigenous Peoples themselves in the **standardization*** activities, content development and capacity building through their organizing consultations, special events, prizes and award ceremonies, and **hackathons***

Based on lessons learned from the celebration of the 2019 International Year of Indigenous Languages, the Global Action Plan declares that: 'Digital technologies play a growing role in influencing societal development and should contribute to the intergenerational transmission, preservation, revitalization, creation in/and promotion of Indigenous languages.' (UNESCO, 2020: 9).

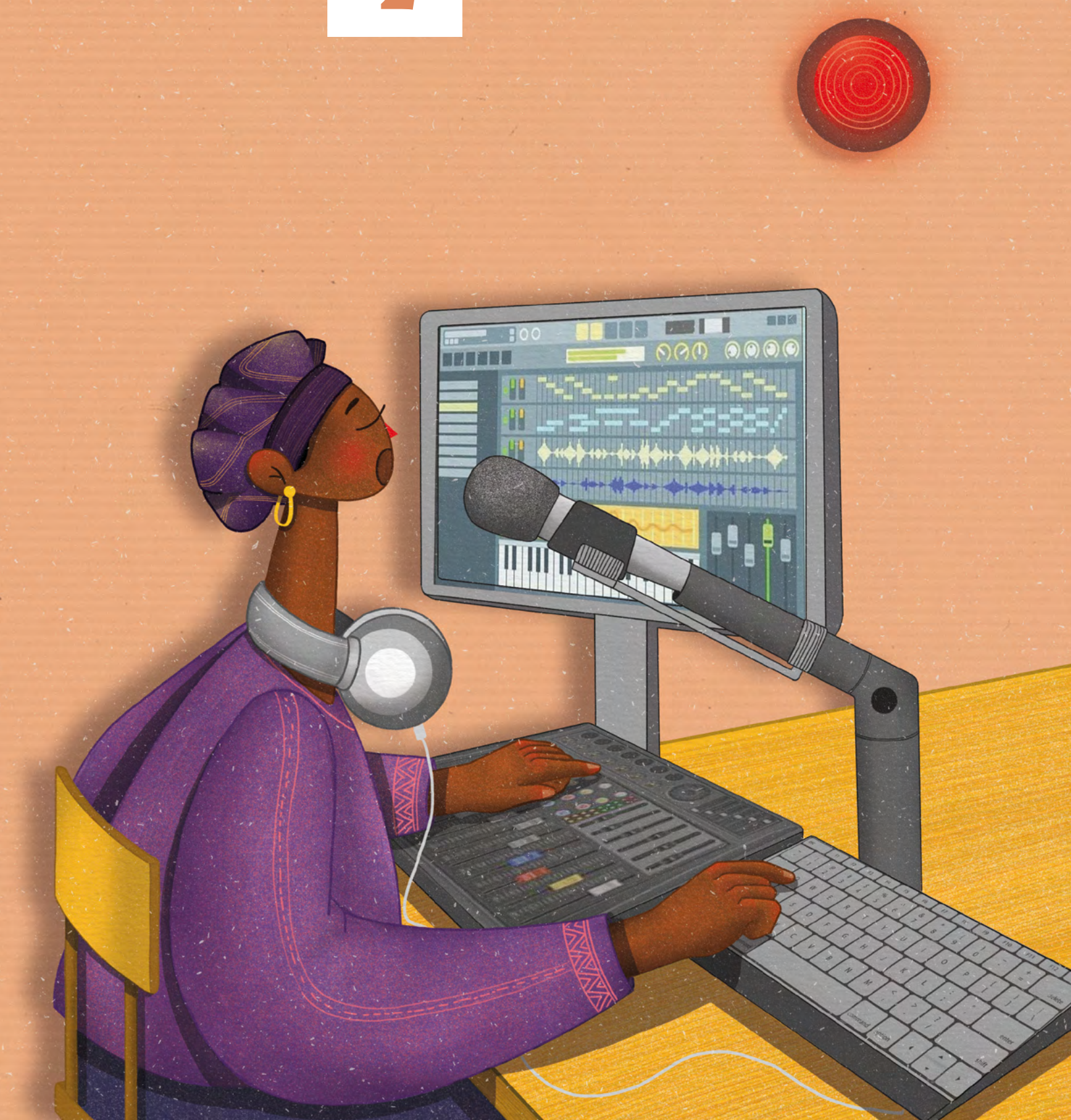
The Global Action Plan is built on the Los Pinos **[Chapoltepek*]** Declaration– Making a Decade of Action for Indigenous Languages (2022-2032). The Los Pinos [Chapoltepek] Declaration was prepared considering lessons learnt which were discussed at the high-level closing event of the 2019 International Year of Indigenous Languages which took place in Mexico City, Mexico from 27 to 28 February 2020. This toolkit aims to be a resource to be used for the implementation of the Global Action Plan.

A key principle established by the 2020 Declaration (which the Global Action Plan has incorporated) is the **centrality of Indigenous peoples***, expressed by the motto 'Nothing for us without us'. This embodies "the principles of self-determination, participation and leadership, and the right to develop, revitalize and transmit to future generations the languages which reflect the insights and values of Indigenous Peoples, as well as their knowledge systems and cultures" (UNESCO, 2021b: 35).

Finally, the *Evaluation of UNESCO'S Action to Revitalize and Promote Indigenous Languages (within the framework of the IYIL 2019)* also recognizes that: 'digital activism plays a significant role in processes of language revitalization, using information and communication technologies to increase the visibility of Indigenous languages and populations and combat the stigma of [Indigenous languages] as lacking or unsuitable for the modern era.' (UNESCO, 2021a: 20). These declarations and reports highlight the need for a toolkit such as this one to support Indigenous networks and communities.

CHAPTER

2 Context



Context

This toolkit acknowledges that just as the approximate 7,000 languages spoken and signed today have their own unique characteristics, so do the unique contexts in which language communities operate. Therefore, proposing a roadmap rather than a unique recipe has been the key approach for the development of this resource.

Even within a particular region, spoken languages exhibit different characteristics regarding the number of speakers, the age of those speakers, their society's attitude towards the language, not to mention other factors that could influence digital initiatives including internet penetration, social media choices, and **digital literacy*** rates, among others.

Despite these differences, this toolkit seeks to find common pillars, one of which has been key individuals and emerging leaders that identify with the urgency of protecting their languages against displacement and loss. What unites these practitioners, and their communities, is their passion for and commitment to their languages.

Growing language endangerment

In the last three decades, the speed and scope of **language endangerment*** and loss have become a matter of concern for academics, for cultural institutions and, most importantly, for users (speakers and signers) of the languages in question. The dire situation in which many languages exist and attempt to survive became evident in the 1990s (Flores, Cordova and Cru, 2020: 9). Since then, the work developed by linguistic researchers, institutions and language users has increased and, for the first time, converged globally in the celebration of the International Year of Indigenous Languages in 2019.

'A language is in danger when its speakers cease to use it, use it in an increasingly reduced number of communicative domains, and cease to pass it on from one generation to the next.' (UNESCO, 2003b: 2)

Language endangerment is characterized by several factors including misinformation, prejudice, discrimination, hostility, abandonment, displacement, and marginalization. Often, a grade scale is used to understand language endangerment and carry out subsequent analysis. Language endangerment and loss of vitality affect a demonstrably high number of languages, according to various reports. Statistics vary and the speed of language loss is a matter of much discussion, but there is no doubt that an increasing number of languages are no longer transmitted to the younger members of the community. [1]

[1] See, for example, the Encyclopedia of the World's Endangered Languages (2007) by Christopher Moseley.

Growing awareness has also developed about the existence of specific sign languages used by Indigenous peoples, many of which are not well documented, and which are being displaced and disappearing. These have been dubbed the 'forgotten endangered languages' (Nonaka, 2004). These sign languages are as complex as the spoken ones, with their own grammar and dialectical varieties. There are over 140 sign languages documented to date.[2] For linguist Anouschka Foltz, Indigenous sign languages 'can teach us a lot about inclusion: [since] deaf community members are well integrated into the community because everyone, deaf and hearing, uses the sign language'. [3]

The loss of languages should not be considered an unavoidable process. As Flores, Cordova and Cru (2020: 10) remind us, in the last two decades a small number of languages have managed to overcome the displacement experienced in previous years. There are many opportunities provided by a new global framework in which linguistic diversity is valued as one of the main assets of humanity to confront serious threats such as biodiversity loss, environmental degradation, pandemics and climate change.

Importance of linguistic diversity reflected in international declarations

The link between cultural diversity and human rights was clearly established in UNESCO's Universal Declaration on Cultural Diversity, approved in November 2001. This declaration established among other things that: 'cultural diversity is as necessary for humankind as biodiversity is for nature', and that the 'defense of cultural diversity is an ethical imperative, inseparable from respect for human dignity'. The declaration also affirms that: 'Freedom of expression, media pluralism, **multilingualism***, equal access to art and to scientific and technological knowledge, including in digital form, and ***the possibility for all cultures to have access to the means of expression and dissemination*** are the guarantees of cultural diversity.' [Emphasis added][4]

Two years after the Declaration, the 2003 *Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace* also recognized the importance of linguistic diversity for the full implementation of human rights and fundamental freedoms.

The protection of languages has also been explicitly addressed by one article of the *Universal Declaration of the* ***Rights of Indigenous Peoples**** (UNDRIP), approved by the UN General Assembly in 2007. Article 13 of the UNDRIP states that: 'Indigenous peoples have the right to revitalize, use, develop and transmit to future generations their histories, languages, oral traditions, philosophies, writing systems and literatures, and to designate and retain their own names for communities, places and persons.' It also states that: 'States shall take effective measures to ensure that this right is protected

[2] https://www.ethnologue.com/subgroup/2/

[3] Sign languages are fully-fledged, natural languages with their own dialects – they need protecting

[4] Universal Declaration on Cultural Diversity

and also to ensure that Indigenous peoples can understand and be understood in political, legal and administrative proceedings, where necessary through the provision of interpretation or by other appropriate means.'

In this way, UNDRIP has joined other important cultural and linguistic diversity protection charters from Africa (such as the Cultural Charter for Africa and the Charter on Human and Peoples' Rights, approved by member states of the African Union in 1976 and 1982 respectively) and Europe (Charter for Regional or Minority Languages, approved by the European Union in 1992).

Current situation of languages and their usage in cyberspace and digital media

Both the Universal Declaration on Cultural Diversity and the 2003 Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace acknowledge the impact that globalized digital communications could have on the diversity that is subject to protection and promotion. The Declaration considers that: 'the process of globalization, facilitated by the rapid development of new information and communication technologies, though representing a challenge for cultural diversity, creates the conditions for renewed dialogue among cultures and civilizations'. The Recommendation also indicates that this development does provide 'opportunities to improve the free flow of ideas by word and image, but also presents challenges for ensuring the participation of all in the global information society'.

In a world characterized by instantaneous and intensive digital presence, the advantages provided by the internet and digital technology could also endanger linguistic diversity. Globalized communication has been known to give rise to more homogenous cultures, reflecting the economic and cultural influence of certain actors whose lifestyles, fashions and trends are adopted across the world. The consequences of this are the loss of linguistic variety.

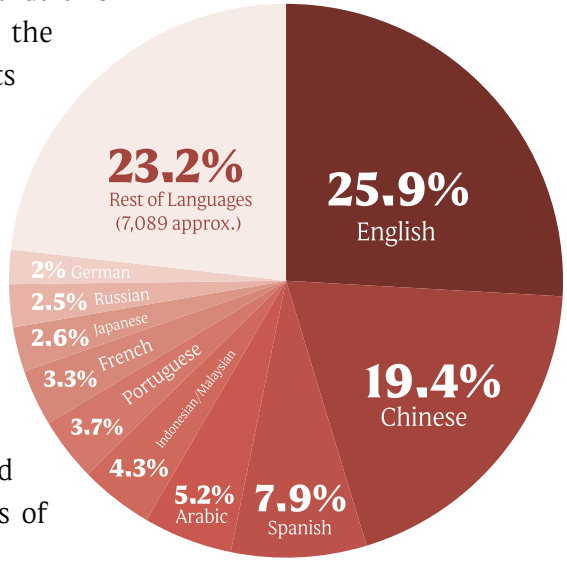


Figure 2: Most common languages used on the internet (January 2021).

According to a report published by Statista.com, the most common languages used on the internet by share of users are English, Chinese, Spanish, Arabic, Indonesian/ Malaysian, Portuguese, French, Japanese, Russian and German. These ten languages represent approximately 76.9% of global online communications as of January of 2021[5] (see, the graphic).

[5] Report published by Joseph Johnson on 27 January 2021. [Accessed November 2021]

Furthermore, English accounts for one-quarter of the total share of users, and Chinese for one-fifth. The current state of multilingualism online might also reflect the inequality pertaining not just to gross national income and differential levels of education and **digital literacy***, but more importantly, unequal infrastructural development in the provision of internet connectivity throughout the world. For instance, an experiment conducted by John Matherly, first in 2014 and later in 2016, shows just how unevenly the world is 'connected'.[6] In this experiment, Matherly, the founder of Shodan, a company that tracks every single device accessing the web, sent out Internet Control Message Protocol (ICMP) requests to some four billion devices. In an interview with the portal Inverse, he shared this internet cartography that shows not just people connected but also universities, CCTV systems, as well as devices linked to the 'Internet of Things'.

In 2016, Rising Voices produced one of the first reports focused on digital initiatives that Indigenous language users were developing in Latin America (Llanes-Ortiz, 2016). This report was a still picture of a time before the sudden growth of social media platforms like Instagram and TikTok. Since then, more individuals and communities are recognizing the potential of incorporating internet-based tools and digital media as part of a larger strategy to promote their languages, as an effective way of attracting young people.

The United Nations General Assembly resolution of 18 December 2019 proclaimed 2022–2032 as the *International Decade of Indigenous Languages,* to draw attention to the critical loss of Indigenous languages and stress the urgent need to take steps at national and international levels to preserve, revitalize and promote them. The resolution expressed concern at the vast number of endangered languages, in particular, Indigenous languages. The Global Action Plan of the International Decade of Indigenous Languages also highlights the need for considering sign languages used by Indigenous people among those which should be supported and promoted to ensure the right to access public services and information for Indigenous persons with disabilities. The toolkit will contribute to the implementation of the Global Action Plan and relevant "Output 3. Favorable conditions established for digital empowerment, freedom of expression, media development, access to information and language technology, alongside artistic creation of Indigenous languages".

The digital initiatives and resources examined and presented in this toolkit seek to meet the needs expressed in the passage quoted above.

[6] Hines, Nickolaus (2016). This Internet Map Shows Our 'connected Worldview' Retrieved from: Inverse.com. 8.8.2016. See, also Matherly's page on Imgur.

CHAPTER

3

Considerations about digital initiatives for indigenous languages

Considerations about digital initiatives for indigenous languages

This section introduces important aspects to consider regarding digital approaches or initiatives for Indigenous languages. It offers a few working definitions and explains why this toolkit is primarily devoted to the promotion and revitalization of Indigenous languages. It also discusses the potential opportunities presented by digital technologies for integration into language revitalization processes.

What we mean by indigenous, minoritized and under-resourced languages

As previously mentioned, the majority of around 7,000 languages in the world are in some degree of endangerment. Not all of them, however, can be considered Indigenous languages. That is to say that within the larger category 'endangered languages', there are multiple other forms of classification that correspond to specific geographic and historical processes.

Unpacking language categories

In a video blog published in 2019, linguist and social entrepreneur Lindsay Williams explains how the categories such as **endangered language, minority language, Indigenous language, official language, regional language, creole language***, among others, differ and overlap in social and linguistic analysis. See more.

She uses six different languages, Welsh, Yucatec Maya, Maori, Guaraní, Hausa and Kristang, to illustrate the ways in which these definitions apply. She argues that, for instance, Guaraní is an 'Indigenous language' of Paraguay (and other countries) in Latin America but that it cannot be considered a 'minority language', since estimates put the number of speakers between 80 and 90% of the population, and it is one of the official languages of Paraguay and Bolivia (Plurinational State of). This is similar to Hausa, which is an 'Indigenous language' of Nigeria and other countries in West Africa, but which cannot be considered a 'minority' or 'endangered language'. Welsh, on the other hand, is an 'official language' in one of the four nations of the United Kingdom, and while it can be considered a 'minority language', it is not currently considered 'endangered', after being the target of a few decades of revitalization policies. There is also Kristang, a 'creole language', which developed from the interaction between Portuguese and Malay in Malaysia, which is a 'minority' as well as an 'endangered language'. Williams considers

that Māori is an 'Indigenous language' that is no longer 'endangered', whereas Yucatec Maya is both 'Indigenous' and 'endangered'. In strict historical and political terms, the Welsh language is a 'native' and 'local language' but not an 'Indigenous' one, since the Welsh people are considered today one of the four 'national ethnic groups' of the United Kingdom. Given the varied and often confusing ways in which these categories are applied, we should consider how and where they are used.

For instance, the European Union defines regional or **minority languages*** as those that have been: 'i. traditionally used within a given territory of a State by nationals of that State who form a group numerically smaller than the rest of the State's population; and ii. different from the official language(s) of that State' (European Charter for Regional or Minority Languages, 1992). While the notion of a minority language is tied to the proportional or absolute number of speakers in a certain country, **minoritization of languages*** is associated with complex forms of linguistic displacement .[7]

Another category to consider is **under-resourced languages*.** These are languages with one or all of the following characteristics: 'lack of a unique writing system or stable orthography, *limited presence on the web,* lack of linguistic expertise, *lack of electronic resources for speech and language processing,* such as monolingual corpora, bilingual electronic dictionaries, transcribed speech data, pronunciation dictionaries, vocabulary lists, etc.' They are also known as 'low-density languages', 'resource-poor languages', 'low-data languages', or 'less-resourced languages' [emphasis added] (Besacier et al., 2014: 87). However, they are not necessarily synonymous with 'minority' or '**minoritized***' languages. In some cases, under-resourced languages are in fact the main language in a given country, like Icelandic in Iceland. In comparison, a 'minoritized language' like Catalan can be considered a well-resourced language (given, for example, its availability and presence on different digital platforms). In short, under-resourced languages are not always endangered, whereas endangered languages are generally under-resourced.

Lastly, **Indigenous languages*** are those preserved, spoken and signed by nations or populations whose histories and cosmologies, as well as self-identification, define them as **Indigenous peoples***. In the recent past, the United Nations employed the definition offered by the 1989 Convention 169 of the International Labor Organization.[8] This described Indigenous peoples as the descendants of populations 'which inhabited a country or geographical region during its conquest or colonization or the establishment of present state boundaries' and 'retain some or all of their own social, economic, cultural and political institutions'.

[7] About minoritization or minorization, see, in English ; or, in French: Kasbarian (1997).

[8] C169 - Indigenous and Tribal Peoples Convention, 1989 (No. 169)

While all the current endangered languages are important to the United Nations and to UNESCO, Indigenous languages have a special value given that they represent unique systems of knowledge and understanding of the world. The extinction of Indigenous languages 'would amount to losing a cultural treasure. It would deprive us of the rich diversity they add to our world and the ecological, economic and socio-cultural contribution they make. More importantly, their loss would have a huge negative impact on the Indigenous cultures concerned'. [9]

Culturally and socially engaged action for endangered languages is often labeled **language revitalization.** However, many language users (speakers and signers) are critical of this term and prefer to use others, like reclamation, emancipation or strengthening. The differences are subtle but important since talk of revitalizing is translated as the 'bringing back to life' of 'dead languages'. Speaking of the mother tongue as dead heritage is upsetting for many Indigenous language defenders and promoters, which is why they prefer to adopt other terms to describe their work.

On the other hand, as Lenore Grenoble (2021 in Olko and Sallabank) points out, language revitalization is presented as focused on the creation of new language users (speakers and signers), the creation or expansion of use domains, and the creation of a whole new generation of speakers. All this, she warns, is very simplistic and could lead language defenders and promoters to feel frustrated if they do not fulfill such ambitious goals.

Language reclamation* conveys a notion of recuperation, but it also communicates an interest in combatting injustices in the status quo. It is defined as a 'larger effort by a community to claim its right to speak a language and to set associated goals in response to community needs and perspectives' (Leonard, 2012). Language emancipation is a bottom-up process initiated by users of an Indigenous or minority language to improve both its status and functionality (Huss and Lindgren, 2011).

Other Indigenous scholars, like Yucatec Maya linguist Fidencio Briceño, prefer the name 'refunctionalization' or u ***k'a'abeetku'unsa'al*** in the language. With this term, Briceño implies a shift in the way people relate to their language: rather than perceiving it merely as a means to an end, they embrace it as an intimate part of their heritage, of what they are as a people.

Finally, some Indigenous defenders and promoters focus on language strengthening and maintenance as key elements of their linguistic planning. This is often achieved by building up language speakers and learners' self-esteem and increasing awareness of culture, place, and history.

[9] 'The role of language', 2019 International Year of Indigenous Languages.

What do these digital initiatives entail?

In 2016, the Principal Investigator of this toolkit, Dr. Genner Llanes-Ortiz wrote the Rising Voices report, "Apropiarse de las redes para fortalecer la palabra – Una introducción al Activismo Digital de Lenguas Indígenas en América Latina" (Appropriating the internet to strengthen our languages – An introduction to Digital Activism of Indigenous Languages in Latin America), based on research developed with a team of Indigenous researchers from Mexico, Colombia, Peru and Bolivia (Plurinational State of). This was a first attempt to examine and understand the creative and complex Indigenous appropriations of these technologies in a region where they had not been comprehensively addressed. The report documented and examined the diverse ways in which digital technologies and media are used for the revitalization of Indigenous languages.

The rapid growth in the use of digital technologies, online communication, and social media by Indigenous peoples in the world has been a focus of analysis since the early years of this century (see, for example Landzelius, 2006). The analytical foci have been multiple and rich, from documenting and problematizing the presence of 'natives on the net', enquiring the new Indigenous expressive ways, and the crafting and broadcasting of new collective identities that take place online, to investigating the pedagogical potential of these technologies (maps, etc.), the construction of Indigenous territories in cyberspace, and more recently to exploring how multi-modality in digital communication could dialogue with Indigenous knowledge systems.

The use of Indigenous languages in digital platforms for communication, distribution of knowledge and creation of virtual communities is a process that reverses the historical, political and economic linguistic exclusion that places Indigenous languages in positions of precarity. Through digital initiatives such as, for example, the **localization*** of software, Indigenous individuals, organizations and communities exercise their right to communicate and educate people in their own languages. As highlighted before, the preservation of Indigenous languages protects knowledge that is often unique, while safeguarding the identity and wellbeing of their speakers. This and other Indigenous rights continue to be denied due to lack of political backing and the injustice embedded in national institutions. Digital initiatives in Indigenous languages can thus be understood as forms of social engagement which resist language displacement and loss.

The 'digital' in these forms of engagement refers to the central use of electronic equipment and media in the recording, production, reception and/or transmission of Indigenous language-based information and education materials, such as texts, sounds, images, or interactive programmes. Equipment that works digitally today includes computers, but also video cameras, photographic cameras, tablets, e-book readers, electronic billboards, and cell phones, particularly so-called smartphones. The most

common digital media include, of course, computer software, or 'apps', digital images, digital video, video games, websites (including social networks such as Facebook, Twitter, Tumblr, Flickr, Instagram, Soundcloud, TikTok, etc.), online databases, digital audio (mp3, among others), and electronic books in various formats.

In the analysis from which this toolkit is produced, it seemed necessary to try to capture as many and diverse digital initiatives of Indigenous languages as possible. This document has sought to identify successful and innovative cases with the help of Indigenous language defenders and promoters and allied organizations. Thus, it pays attention to projects that put digital technologies and media at the centre of their strategies in the preservation and promotion of Indigenous languages, and on those that are dynamic and more collaborative.

How digital initiatives provide opportunities to work with both (but also across the divide between) oral and written languages

As already mentioned, there are concerns that the almost omnipresent use of computational technologies, electronic networks, and virtual communities in daily life, could become a serious threat to Indigenous ways of life, and languages in particular. Some Indigenous and non-Indigenous scholars have argued, however, that there is a certain 'kinship' between digital media and Indigenous cultural practices. This, they say, can be identified in their similar reliance on visual and/or haptic languages, in their emphasis on **performance*** and interactivity, and in the generative coupling of 'arts' and 'science' (de la Garza, 2016: 60-61).

Despite criticisms launched against Indigenous datafication at the turn of the century for failing to, arguably, preserve the embodied and socialized features of Indigenous knowledge (see, for example, Agrawal, 2002), the **multimodal*** adaptability of digital media has inspired Indigenous actors to experiment with novel forms of engagement, especially in relation to their languages.

The Web 2.0, also dubbed the era of participatory internet, introduced more interactivity to cyberspace, with the possibility of customizing and mixing different media into personal websites, video channels and fan pages, and of receiving comments and experiencing reactions from followers and anonymous users, virtually in real time. This improved the possibilities that non-professionalized but 'digitally literate' cybernauts had to combine multiple media sources, thus embracing the multimodality* of digital media. Multimodality refers to the combination of different ways of creating meaning within a single medium, for example, in videos posted on the internet containing embedded text, real life moving images, animations, flashy graphics, sound effects, hyperlinks, and comment boxes. Semiotics scholar Gunther Kress considers that

multimodality is rapidly becoming the dominant form of communication and learning, which has been in part prompted by the growth of digital interactions. For him, the contemporary media landscape presents the following elements:

- The affordances of *participation* of current media technologies
- The global and local *'reach'* of media – in many ways obliterating the difference between the global and the local
- *User-created content*
- *Accessibility/connectivity/mobility/ubiquity* of persons and information
- Convergence of *representational, productive and communicational* functions in technologies and devices
- *Multimodality,* that is, representations in many modes, each chosen from rhetorical aspects for its communicational potentials'
  (Emphasis in the original; Kress, 2010: 21-22)

These are elements that Indigenous digital practitioners are using to their own advantage, and that this toolkit examines and discusses by grouping various digital initiatives' examples according to the goals they seem to pursue.

What are the challenges and barriers for these digital initiatives?

Linguistic: A high number of Indigenous languages lack a **standardized*** alphabet, which makes written communication and, importantly, the production of educational materials, difficult. Some linguists argue that these languages need to be documented first, before teaching materials can be produced. Some of the most spoken Indigenous languages have multiple regional variants (to the point that some are now considered language families rather than single languages). Language promoters and defenders are frequently confronted with the challenge of having to pick one variant over the others. Sometimes, the strategy consists of creating a **standardized*** form that only a few language professionals really use.

Accessibility: Indigenous regions tend to be under-serviced by internet and mobile telephone companies, which limits digital communication and the use of digital media for language promotion or education. In some cases, the services are present, but the costs are very high. Occasionally, Indigenous elders and Indigenous persons with disabilities find it difficult and intimidating to use digital technologies. Some Indigenous languages use writing systems, scripts or special characters that are not always readily available, or that have not yet been **standardized*** and coded in electronic devices.

Technical: Indigenous communities and language promoters often work with basic, low performance or second-hand equipment. They generally express the wish to work with more specialized devices, like better cameras, high-definition camcorders, etc. When their devices break, they find it difficult to replace them.

Technological: There are different levels of **digital literacy*** among Indigenous stakeholders and practitioners. Language promoters and educators know how to use the basic functionalities of various **proprietary*** software packages that are pre-installed in the equipment they acquire, but are not always familiar with more complex operations, or think that they need more specialized and expensive software (and equipment) to produce attractive media to promote their language. Few Indigenous digital practitioners are familiar with the free and **open-source software*** packages that are not only as equally functional as the proprietary packages, but that also come with more comprehensive documentation and tutorials for this type of work. Operating software packages, including reading documentation and tutorials, require that Indigenous communities and language promoters also possess a high degree of familiarity with the (non-Indigenous) languages these software systems are available on, creating an additional hurdle for promoters and defenders to overcome. Among the younger generation, there is interest in training to code and design their own, more complex and appropriate software, but few opportunities, resources or base knowledge to do so.

Socio-cultural: There are important generational gaps between community members that are knowledgeable and fluent in the language, and those who are more digitally literate. These divisions generate suspicions and often break collaborations between the older and the younger generation. Furthermore, Indigenous women are often charged by default with the responsibility of passing the language to the next generation, but their participation can frequently be limited by traditional gender roles and sexism. This results in a partial documentation of linguistic knowledge that tends to focus predominantly on male speech and vocabulary. There are also strong Indigenous criticisms and misgivings related to **digitization*** of Indigenous languages and heritage, which involve (justified) fears of **cultural misappropriation*** of the language.

Political: This is related to the linguistic challenge. Clashes over orthography and normalization of the language could lead to one linguistic variant being privileged in language promotion, education and/or revitalization initiatives, which would potentially alienate speakers of other variants. Lack of consensus between speakers of different variants could block progress in the design of educational policies and other language strengthening actions. In some cases, a few individuals or groups become powerful middle people or gatekeepers between cultural agencies and the language community. In other cases, non-speakers or governmental officials make decisions

without the participation of Indigenous language users, which could result in the waste of public funds and failure to strengthen or rescue certain endangered languages. Free, prior and informed consent is a principle to be applied when dealing with language development issues.

Sustainability: This is perhaps one of the most pressing challenges for many language revitalization projects. There is a great deal of creativity and spontaneity among the digital projects capturing the public's interest in preserving endangered languages. However, while this is a strong asset for language preservation requiring a substantial investment of energy and resources, it often yields meager results and translates to certain reservations among the individuals involved. This fatigue must therefore be anticipated and adequately managed in order to maintain a sustainable workflow and consistent level of interest and participation. At the same time, because the number of endangered languages and the factors involved in their endangerment are often higher than expected, economic resources for their revitalization, reclamation or maintenance are frequently underestimated. While Indigenous communities are capable of generating their own resources to support their languages, few are financially equipped to maintain the levels of engagement that seem necessary to stop their displacement and loss. Governmental and international funds are important, but so is proper and creative planning to ensure a constant supply of resources for language revitalization or maintenance. These resources do not have to be exclusively economic, but also educational, experiential, and organizational, so as to guarantee the sustainable management of language initiatives.

CHAPTER

4 Methodology

Methodology

International consultations on digital based initiatives

Since 2014, Rising Voices, along with other partners, has been facilitating spaces where peer learning and exchange can take place. Starting with the first 'Gathering of Indigenous Language Digital Activism' that took place in Oaxaca, Mexico in 2014, similar meetings were organized in Colombia, Ecuador, Peru, Bolivia (Plurinational State of), Guatemala, and Chile. During these meetings participants benefited from and were encouraged by the fact that shared knowledge can flourish alongside a collective sense of working towards similar goals despite coming from different backgrounds. For the preparation of the Toolkit, UNESCO and Rising Voices organized six capacity building seminars for digital Indigenous language defenders and promoters in Africa, Asia-Pacific, Latin America and the Caribbean, in 2020 and 2021. The aim of the regional meetings was to ensure that the content included in the Toolkit was relevant, accurate, and useful to launch specific language promotion activities online.

Additional exchanges of learnings took place in online spaces, through a series of campaigns. Through rotating Twitter accounts managed by Rising Voices, each week a different language defender and promoter is invited to share their experiences and achievements, further amplifying the diversity of indigenous voices online. Prior to each week's change in host, short Q&A blog posts were published on Rising Voices to provide additional information about the host's work and personal motivations.

Rising Voices also produced two participatory research projects, including an initial overview of Indigenous Language Digital Activism in Latin America in 2016 that was presented through case studies, as well as recommendations to help support the emerging field of Indigenous language digital initiatives. In addition, another research project in 2017 examined the opportunities and challenges for Wikipedia projects in Indigenous languages of Latin America.

These Twitter accounts include:

Activismo digital de lenguas indígenas *(Latin America)*
@ActLenguas

African Language Digital Activism *(Africa)*
@DigiAfricanLang

AsiaLangsOnline *(Asia)*
@AsiaLangsOnline

NativeLangsTech
(United States and Canada)
@NativeLangsTech

Desk research surveying previous toolkits and resources

This Toolkit has not sought to create new guides, but to 'curate' the content and contributions created by international partners and digital practitioners' networks in different parts of the world. The approach was to conduct a survey of guides, toolkits, and legal frameworks for the protection of **linguistic rights***, and specifically the rights of Indigenous language users. This exercise reported a wealth of information, but with a strong bias towards English and Spanish resources and success stories, and to the North American, Latin America and the Caribbean, Asia and Pacific regions and geographical regions and territories[10]. Consultation for open surveys conducted by Rising Voices in other languages, such as French, Portuguese, Arabic, Russian, Hindi and Indonesian revealed a wealth of experiences and approaches to digital initiatives for Indigenous languages, though timing issues resulted in their being less prominently featured in this toolkit.

Based on research, it was found that the overwhelming majority of user-created guides, tutorials, and manuals on how to use specific digital platforms and tools are only available in majority languages. This already identifies a need that these types of resources should be available in more languages.

Surveys and participatory design process with practitioners

This resource was developed through a participatory co-design process, relying heavily on the sharing of knowledge, skills, and experiences by members of global networks of digital Indigenous languages defenders and promoters. Through the different interactive activities cited above, the authors of the toolkit have gained extensive insights into the challenges and potential strategies to overcome them, shared both during in-person activities, online campaigns and events.

In early 2021, an invitation was extended to Indigenous digital practitioners hailing from twenty-five countries and speaking more than fifty different languages, to take part as members of an Advisory Group for the preparation of the Toolkit. Each of them had been actively leveraging the potential of internet-based tools or digital media to promote their languages in online spaces. Indigenous digital practitioners were asked to complete a survey, highlighting their perspectives on the challenges facing their language community; they were also asked to describe their future aspirations with regard to their language digital initiatives. Digital practitioners also shared examples of digital projects that they have been inspired by, which helped update the existing body of knowledge regarding the most up-to-date projects.

[10] In the Toolkit, the regional groupings are based on the geographic regions defined under the Standard Country or Area Codes for Statistical Use (known as M49)[5] of the United Nations Statistics Division.

In addition, like-minded organizations, institutions, and working groups were invited to support Indigenous language communities to share their perspectives about the needs and challenges facing potential digital practitioners. Most of these partner organizations have been a part of previous collaborative campaigns such as *Tweet in Your Mother Language* campaign or the *Mother Language Meme Challenge*, which Rising Voices helped to co-organize.

The full list of advisory group members and partners can be found in Section 10 of this resource document.

A wider net was also cast by launching a global survey targeting speakers of Indigenous languages, whether or not they were currently using digital technologies for language promotion, to learn more about their current needs and wish list for such an educational resource. Thanks to the collaboration of Global Voices Lingua volunteers, as well as partners, the survey was made available in English, Spanish, French, Portuguese, Hindi, Malay, Indonesian, Nigerian Pidgin English, Thai, Bangla, Turkish, and Russian, corresponding to the language needs of respondents. Despite the limits of this survey and its reliance on limited resources and time, many of these versions acted as bridge languages to reach bilingual or multilingual speakers, who could complete the survey in those languages, broadening the scope of access for an overall positive result.

Integrating technical resources and toolkits

This toolkit has used only a small fraction of the wealth of information that resulted from the consultation exercises described above. From the analysis of different experiences reported, the outline of **eight key approaches** started to appear. Specific examples helped inspire the general definition of these approaches which will be introduced in the next section. These selected projects and activities were also those that connected more explicitly with other relevant technical resources and toolkits that were identified during the first stage (see above). In what follows, specific case studies, technical and methodological resources, and previously published guides, manuals and toolkits are grouped in training modules identified by key approaches.

CHAPTER

5

Structure of the Toolkit

Structure of the Toolkit

How were these key approaches identified?

While conducting research for the integration of this toolkit, it became apparent that the best way of organizing the continuously growing number of projects, initiatives and activities that seek to document, promote, and teach Indigenous languages with digital technologies and media was to look at their underlying most significant effects.

The key approaches identified in the activities developed by Indigenous digital practitioners represent discernible ways or paths to achieve the long-term goal of language preservation, strengthening or revitalization. In this way, they should not be seen as mutually exclusive. A project like the creation and circulation of Indigenous language content in social media platforms can serve the key goals of multiplying, normalizing, educating and reclaiming, all at the same time. There is, however, a more easily identifiable result that can be measured and be an index of success in the specific approach taken. If the goal is to gain more visibility for the language on the internet, then the practitioner or practitioners could tactically decide to organize their work in terms of *Multiplying*. But if the ultimate goal is to create speakers or increase fluency in the language, then the practitioner or practitioners would do well to strategically plan their Indigenous content for *Educating*.

The discussion of key approaches and use of examples in this toolkit have the intention of being places to think about the potential that any given project has to aim more systematically towards one or more goals. For example, understanding the impact that the **localization*** of software could have in Normalizing languages may also help Indigenous digital practitioners to incorporate other key approaches to their work, like *Educating* or *Reclaiming*.

Structure of the modules

The toolkit is thus organized according to the impact that certain activities seem more suited to achieve. The presentation of each key approach has been organized so that it can be used as a training module. The intended learning objectives for each module are presented at the beginning.

A description of the key approach and a discussion of how specific activities contribute to that critical choice follow. Inspiring stories have been selected to show how certain projects have succeeded or are contributing to the intended changes or processes.

A list of key and practical resources is offered for those who would like to initiate a project or to improve the work they already do. In response to the challenge of sustainability, this report offers a few ideas about ways to evaluate, estimate or simply grasp the impact of certain activities when perceived as deliberate goals. Each key approach module closes with a self-assessment exercise of the learning accomplished.

The modules address the efforts of the public and private sectors, and civil society to provide resources that help to overcome the lack of presence of Indigenous languages in cyberspace: They offer inspiring stories of ways in which Indigenous digital practitioners are creating, and could access educational, cultural and scientific digital content in their own languages. They focus centrally on listing and curating sources and examples that encourage and support capacity building to produce Indigenous content on the internet. The initiatives and projects that the toolkit contains can also inspire Member State institutions in the formulation of linguistic policies.

An important number of the examples provided by the toolkit highlight the potential of collaborative participatory research for the development (and **localization***) of digital tools. The toolkit lists policies and regulations, but mostly focuses on reporting best practices related to multilingualism on the internet. It discusses ways to support universal access to the internet as an instrument for the realization of human rights. It discusses a few strategies and models, based on inter-institutional cooperation, related to community projects that foster the training of ICT leaders.

The toolkit also refers to a few experiences of the use of ICT services for socio-economic development, including **open-source*** technologies and capacity building. It reports about efforts to improve access to linguistic and cultural records that have been hitherto held by governmental and cultural institutions and that are crucially important for Indigenous digital practitioners, and for which considerations regarding Indigenous protocols and intellectual property rights are also key. It lists several resources aimed at facilitating ICT literacy in relation to language promotion, education and/or strengthening, as well as 'an open, integrated and intercultural education', with awareness of ethical principles and values.

The toolkit prioritizes projects and initiatives led by Indigenous digital practitioners and community members in consonance with the principle of **centrality of Indigenous peoples***. It also strives to identify the links between language digital initiatives and the exercise of human rights and fundamental freedoms, by stressing the ways in which certain projects have the potential to support diversity, gender equality and inclusion.

In relation to the specific objectives of the International Decade of Indigenous Languages, the toolkit presents short, medium and long-term initiatives to preserve, revitalize, promote and position Indigenous languages, linguistic diversity and multilingualism in the future. It discusses projects that seek to have an impact on justice systems and public services in Indigenous languages; explores strategies to mainstream Indigenous languages in various public spheres and (potentially) policies related to education, culture, information, science, etc.; and provides examples that support Indigenous peoples in safeguarding their intangible heritage, among others.

Using these approaches as training modules for new digital practitioners

Each section focusing on key approaches has been designed to help train new digital practitioners. Each approach has learning objectives that call attention to concepts, frameworks and potential impact that the activities and initiatives reported may be having on stopping language endangerment, promoting language reclamation, or strengthening language maintenance. The Inspiring Stories presented in the toolkit can be unpacked to examine the context where they happened, the tools and resources used, and the impact they report. In addition, each approach module offers further sources, and presents key and practical resources that could be employed by new digital practitioners if they choose to begin similar projects. Suggestions to measure impact and communicate success stories are also part of each key approach, and finally, a set of questions allow digital practitioners involved and workshop attendants to self-assess their learnings at the end of each module.

Each module can be used as an independent training unit or as part of a sequence. It is recommended that workshop organizers and training planners consider the level of **digital literacy*** of their trainees, to make sure that the information and tools can be as beneficial as possible. It would also be advisable to ask workshop participants to have a project sketched or to identify their own short, medium and long-term goals (if at all) before signing up for a certain module. Ultimately, if people have enough time and interest, workshop participants could benefit from seeing the whole picture of the different objectives that multiple language digital activities could pursue.

As mentioned above, these key approaches should not be seen as mutually exclusive. The potential transformations and impact that are discussed for each of the following approaches should be considered as elements of a wider strategy by Indigenous digital practitioners. This means that these key approaches should be seen as converging paths. People choosing one approach can (and must) consider how it connects with the others. The way key approaches are defined should help individual and collective practitioners visualize the most immediate impact that their projects and activities could have in the long and complex process of language revitalization, reclamation or strengthening.

CHAPTER

6

Key approaches for digital initiatives with indigenous languages

Key approaches for digital inititatives with indigenous languages

Inspired by other such toolkits, the following key approaches are used to discuss and organize the presentation of tools and resources in the context of digital engagement with Indigenous languages. They can be understood as planned activities or interventions that seek to generate specific changes. In this way, the toolkit proposes conceptual goals rather than focusing on the specific form of technology or digital platform that is used. Eight key approaches have been identified with an aim to generate a recognizable development in the promotion of Indigenous languages and/or multilingualism in cyberspace.

Those key approaches are:

1. **Facilitating** digital communication in Indigenous languages
2. **Multiplying** Indigenous language content online
3. **Normalizing** the use of Indigenous languages online
4. **Educating** in and teaching Indigenous languages online
5. **Reclaiming** and revitalizing Indigenous languages and knowledges digitally
6. **Imagining** and creating new digital media in Indigenous languages
7. **Defending** spaces for Indigenous languages and linguistic rights
8. **Protecting** Indigenous linguistic heritage and communities

In the following pages the Toolkit will describe and discuss each one of these approaches.

Key approach 1: Facilitating
digital communication in indigenous languages

This approach refers to efforts and initiatives seeking to facilitate the use of Indigenous languages in digital communication and electronic devices. These range from the development of guidelines for the planning of digital media and adoption of technologies for the promotion of Indigenous languages, to the encoding of special fonts to allow Indigenous language scripts to be used in digital communication (for example, Arctic, North America or Western African languages for which particular scripts have been developed; i.e. Yup'ik, Inuktitut, Cree, Ojibway, Cherokee, Bassa Vah, N'ko, Adlam, among others), and to the creation of community-managed networks in isolated regions or the installation of small wireless networks where Indigenous children can access digitized educational materials.

Learning objectives

- To consider the pros and cons of incorporating the use of digital media and technologies in the work for the revitalization, documentation, teaching and promotion of Indigenous languages, minority or under-resourced languages.
- To examine the impact that existing communication infrastructure, technological development and socio-economic conditions have in preventing specific Indigenous, minority and under-resourced languages from having a greater presence in digital, electronic and online communications.
- To identify the challenges that certain Indigenous, minority and under-resourced languages face to even be represented in digital and electronic communications.
- To become familiar with the necessary steps and available tools to use special scripts in digital communications, including with levels of **digital literacy*** and project implementation-related aspects.
- To recognize how socio-political contexts and legal frameworks could affect the enabling of digital, online communication in Indigenous languages.
- To discover ways in which collective initiatives and low-cost technologies could make up for the lack of public and private investment into digital media and technologies for Indigenous, isolated or geographically distant populations and communities.
- To explore the effectiveness, uses and possibilities of establishing digital communication networks without having an internet connection, or digital devices such as computers, smart phones and tablets.

Discussing this approach

While digital media and technologies offer many opportunities for the revitalization and strengthening of marginalized communities and their languages, they pose also important questions and challenges.

For example, can digital resources be sufficiently effective to prevent language loss in contexts where only young people have access to that technology or knowledge? Indigenous language defenders and promoters often wonder if the use of digital resources for the transmission of Indigenous languages and knowledge would not risk increasing the generational gap between the younger and the older generation in Indigenous communities, and further the marginalization of elders and other traditional community experts, who are the stewards of sophisticated forms of knowledge that have been transmitted orally or through practice. Furthermore, the **digitization*** of Indigenous languages and knowledge could result in their **cultural misappropriation*** for purposes unrelated to Indigenous cultural continuity and self-determination.

Therefore, one of the first activities that should be considered when seeking to facilitate digital communication in Indigenous languages is a careful analysis and planning of the digital technologies that could prove to be the most appropriate for the goals that communities, organizations and individuals have in mind.

Introduction to the concept of internet universality

In 2013, UNESCO introduced the concept of Internet Universality to investigate, describe and examine key features that the internet and digital communications should have to promote knowledge societies and sustainable development. The concept responds to four principles, synthesized in the acronym R.O.A.M. These initials correspond to the following:

R. 'The internet should be based on human **RIGHTS'.**

O. 'The internet should be **OPEN'.**

A. 'The internet should be **ACCESSIBLE** to all'.

M. 'The internet should be nurtured by **MULTI-STAKEHOLDER** participation'.

Internet Universality suggests that the development of digital media and technologies should be guided by a holistic approach, and the mutual reinforcement of these four principles. This framework has been further developed into a series of indicators structured around the **ROAM Principles,** with the addition of Cross-Cutting Indicators. These focus on gender and the needs of children, sustainable development, trust and security, and legal and ethical aspects of the internet. As of autumn 2021, ROAM-X Indicators have been used so far to complete Internet Universality national

assessments in Benin, Brazil, Germany, Kenya, Senegal and Thailand. [11] Nearly 40 other countries are in the process of undertaking national assessments as well.

The ROAM-X framework contains a few indicators that are relevant to linguistic diversity, and that are considered within the category Accessibility for All, and specifically under the theme Local Content and Language. About this, the document *UNESCO's Internet Universality Indicators: A Framework for Assessing Internet Development* (2019) states that: 'The principle of Accessibility to All has technical, economic and social aspects. It reaches far beyond mere connectivity, for example, to include issues of affordability, content and capability. It is closely related within societies to the distribution of income and resources between women and men, poor and rich, rural and urban communities, language groups and ethnic minorities, and those affected by disability or marginalization. [...] Economic and social dimensions include affordability, the availability of relevant content, including content in relevant languages, and the capabilities which people have to make effective use of the internet for their own purposes. Aspects of these point to the need for legal and regulatory frameworks which seek to enable affordable access for those living in all communities within a country.' (UNESCO, 2019: 69)

There are also a few indicators indexed in the category **Openness**, under the theme Open Data and Open Government, that refer to Indigenous languages.

These indicators are generated by questions that help to evaluate the development of the internet in a given context. For example:

1. Are there significant differences in broadband access and use between different ethnic communities within the population, including Indigenous peoples?
2. Are domains and online services available which enable individuals to access and use local and Indigenous scripts and languages online?
3. Is there a substantial and growing volume of Internet content in diverse local and Indigenous languages, including locally generated content?
4. Do government departments and local government agencies have websites which are available in all official languages and through all major browsers?

[11] National Assessments.

Indigenous perspectives on accessibility

On the other hand, Indigenous organizations and their partners have also created useful guidelines and reports to help in selecting digital media and technologies based on the specific situation of the language and the objectives of the organizations supporting revitalization efforts.

For example, the organization First Languages Australia launched a report in 2015 that attempts to balance the pros and cons of digital technologies vis-à-vis non-digital resources. This calls to consider how digital devices used in language safeguarding could have such weaknesses as: requiring constant external maintenance or redevelopment to maintain compatibility with changing or new operating systems (depending to varying degrees on the hardware and software used); or that users may have resistance to 'technology', or that such technology 'may rely [heavily] on internet access or other [unavailable and/or costly] infrastructure', among others.

The report recommends asking a few questions when deciding what kind of technology could have more impact in relation to the revitalization goals of the community. Those questions call attention to several aspects. Among many points discussed are:

- Whether the project has been designed according to the needs, accessibility and flexibility of use of Indigenous language users (speakers and signers) or community members;
- Whether the project has thought about facilitating the use of technology by considering the previous knowledge of, or basic training for, Indigenous language users (speakers and signers) or community members;
- Whether the project contemplates activities to inform and raise awareness about the resources used among Indigenous language users (speakers and signers) or community members;
- Whether the project has planned the most effective ways to make the resources widely available to Indigenous language users (speakers and signers) or community members;
- Whether the project will encourage intergenerational collaboration and knowledge transfer among Indigenous language users (speakers and signers) or community members;
- Whether the project will take clear and concrete steps to protect sensitive content from being [**culturally**] **misappropriated***; and,
- Whether the project includes a strategic plan to prevent technological **obsolescence*** or to facilitate future updates of the digital resources employed. (FLA, 2015, pp. 3-5).

A similar approach is taken by the First Peoples' Cultural Council in their handy manual Check before you tech. They have based their recommendations on their 'successes and mistakes with technology' and while acknowledging that they cannot tell anybody what technology is right for them, they aim to 'help in asking the right questions before making a decision'. Their checklist is intended to be used by people working with communities and they do recommend involving them in the analysis and decision-making. Among the questions they ask are:

- How will technology help? (About the appropriateness of tools chosen)
- Who is providing the technology? (About the control of the technology employed)
- Are we ready to make a long-term commitment? (About **technological** maintenance and **obsolescence***)
- How often will changes to the technology be needed? (About Data Ownership, Control and Accessibility)
- How much do we know about security and privacy best practices? (About security, privacy, and disaster recovery planning)
- And a recommendation to have a maintenance plan that ensures that technology stays relevant and usable. (FPCC, 2020).

Dealing with internet connectivity

However, Indigenous language users (speakers and signers) often fare significantly low in terms of internet connectivity available to these populations. This is what the 2020 Indigenous Connectivity Summit, organized by the Internet Society, concluded in its recommendations of 20 October 2020, covering North America in particular.[12] Among some of the most important points made was that Indigenous peoples continue to be 'left out of both national markets and the policy-making processes that support them' in what concerns access to internet broadband. Over 180 individuals also underlined that: 'COVID-19 has highlighted the opportunities and need to truly reach digital equity and ensure everyone in North America has equal access' to the internet. In their recommendations, Indigenous representatives called for decisive action in relation to six critical areas: effective and accurate mapping; inclusivity, community consultation, engagement; capacity building in Indigenous communities; **spectrum rights*** and sovereignty; infrastructure and ownership; and affordability.

Similarly, south of the Rio Grande, a recent study conducted by an Ecuadorian Kichwa researcher, Luis Canelos Vargas, for the initiative CEFO Indígena and Equitable Origin, showed that there are also huge gaps in the provision of telecommunication services in

[12] Internet Society (2020). 2020 Indigenous Connectivity Summit Policy Recommendations.

some Latin American countries. The report conclusions highlight that '[d]igital] tools and media [are] extremely important [...] for upholding rights to culture, identity, self-determination, territory, and livelihood' (Canelos Vargas, 2021: 40).

Limits to Indigenous connectivity are equally related to the lack of choice and high costs associated with the reduced number of internet and telephony service providers that serve, often remote, Indigenous communities and regions. [13]

Addressing the health and humanitarian crisis

Furthermore, in the context of the global COVID-19 pandemic, UNESCO has stressed that: 'For Indigenous peoples, there are challenges that need to be addressed related to the provision of access to lifesaving information for these communities, who are often based in rural areas with absent or limited broadband connectivity or access to other media (radio systems, satellite phones, etc.). Sharing understandable messages with the traditional and youth leaders represents an effective strategy for reaching out to other community members.' [14]

Digital engagement to address these limitations

Faced with these challenges, Indigenous peoples in both North and Latin America have implemented their own solutions to the lack of service from private companies and governments. Srinivasan and Fish (2017) report on one such project in southern California where the Kumeyaay and Luiseño Native American nations decided to implement their own Indigenous digital network, to support efforts to **digitize*** and share their cultural heritage online through the initiative Tribal P.E.A.C.E. (Tribal Preserving Education and Cultural Expression). This has changed name and is known today as the A.C.O.R.N. (A Community Oriented Repository for Natives), but the project contributed the digital infrastructure that connected many of these Indigenous communities for the first time to the internet in the late 1990s.

A similar autonomous project is currently taking place in Mexico through the work of Tecnologías Indígenas Comunitarias, or TIC (coincidentally, the same acronym that stands for Information and Communication Technologies in Spanish). T.I.C. is a civil association made up of Indigenous and rural communities in Mexico, with the technical support and legal assistance of Rhizomatica and REDES A.C. These two organizations accompany people and communities that seek to build, manage and operate their own internet and mobile communication networks.

[13] Deutsche Welle en Español (2021). Internet y pueblos indígenas: muro y oportunidad.

[14] UNESCO (2021). Media and Communications with indigenous peoples in the pandemic. 07/08/2021.

The technology necessary to create community-managed networks is low-cost and relatively easy to manage, with appropriate training. Rhizomatica employs a **GSM radio access*** network and **open-source*** apps to manage the connection. GSM stands for Global System for Mobile communications. Rhizomatica's system architecture consists of a number of different Linux-based open-source components running on commercially available hardware. The GSM receives internet and telephone signals that are then broadcast within the community. Their experience and the tools that they have created to support other communities will be described in some detail as one of our Inspiring Stories in this approach.

TIC Mexico is just one example of the many ways through which Indigenous and other remote communities are solving their connectivity issues. In Latin America, Rhizomatica and REDES A.C. have also worked with Colnodo A.C. to support Redes Comunitarias en Colombia (Community Wireless Networks in Colombia), and AlterMundi in Argentina has also provided support to several rural communities in the country. This technological innovation movement is gradually being implemented in other parts of the world like South Africa, with the support of university researchers, but even more importantly with the active participation of community members and their authorities[15].

GSM radio access* is just one technical approach to setting up locally managed internet and telephony networks. The other is **Mesh Networking***. A mesh network is a system composed of multiple mesh nodes (commonly referred to as points, mesh extenders, or satellites). These nodes communicate with each other to share a wireless connection within a larger area.

Digital communication does not always mean 'the internet'

A modest alternative to community-owned internet networks is the setting up of **local web servers*** in key public locations that allows people to wirelessly access digital information stored in a physical hard drive. This is what RACHEL (Remote Area Community Hotspot for Education and Learning) makes possible. RACHEL is a portable, battery-powered, device that contains copies of educational websites in **offline format***. This means RACHEL can go anywhere in the world and wirelessly deliver free digital educational content to nearby tablets, laptops, or smartphones with no internet or data plans required.

There are additional limitations that Indigenous languages face in digital communication. These have less infrastructural implications and have more to do with coding and programming. For example, the lack of **Unicode*** development to represent nearly 200 forms of writing in which Indigenous languages are expressed worldwide.

[15] More about these experiences: Video Colnodo + Redes Comunitarias en Colombia (2019) and Examples from South Africa (2020)

Most of these alphabets have been used for centuries, but an important number were also created in the nineteenth and twentieth centuries for different reasons.[16] The rationale for the creation of new scripts is that having a system of symbols that have been created to represent a specific set of sounds and concepts facilitates literacy and written communication. Alphabets that were created to represent a different language are difficult to learn and use, especially when other languages are predominant in the areas where an Indigenous or under-resourced language is spoken.

'The Unicode Standard* provides a unique number for every character, no matter what platform, device, application or language. [...] Support of Unicode forms the foundation for the representation of languages and symbols in all major operating systems, search engines, browsers, laptops, and smart phones—plus the Internet and World Wide Web (URLs, HTML, XML, CSS, JSON, etc.).'

The Script encoding Initiative of the Department of Linguistics at University of California, Berkeley has identified nearly 100 scripts that are still to be encoded in the **Unicode Standard***. Minority scripts are still used in parts of Asia and the Pacific, Africa, and the Arab States. Among them are: the Adinkra and Garay alphabets of West Africa, the Avoiuli script of Vanuatu, the Borama (Gadabuursi) alphabet for Somali, the Dham Lipi to write Dhimal in Nepal, the Ibalnan and the Kulitan writing systems of the Philippines, the Lampung alphabet and the Lontara scripts of Indonesia, the Sora Sompeng, Tangsa, Tolong Siki, Toto and Zoulai alphabets used in India, the Western Cham script of Cambodia, and the Caroline Island writing used for Woleai in the Pacific.

Along with this initiative of Berkeley's, digital practitioners can also follow the Translation Commons resources for the development of standard language codes and Unicode fonts for their Indigenous languages. See the Resources section for more information.

On the other hand, today **Unicode Standards*** exist for dozens of Indigenous language scripts, including Cherokee, Osage, Canadian Aboriginal (which is used to write Cree and Inuktitut, among other Indigenous languages), Adlam (created to write Fulani, a West African language spoken by 40 million people), and Thaana (for the Maldivian language), among others.

[16] For more about how and why different alphabets were created, see: The Cherokee Syllabary, and here, Why West Africa keeps inventing writing systems https://www.youtube.com/watch?v=xa8BYZrSTxY

Language users (speakers and signers) and digital practitioners working with these languages can access these **Unicode standards*** and **typefaces*** or fonts in different ways. They can download the Keyman program, created by the Summer Institute of Linguistics (SIL) International, and install it in their computer to enable their keyboard to write using the characters for the language. Originally created in 1993 to type Lao on Windows, Keyman is now a free and **open-source*** keyboarding platform. It offers solutions for more than 980 scripts and variants. There is more information about how to use this tool below.

Language defenders and promoters can also search for and install the **free**ly available, **open-source*** Noto font family from Google Fonts. The Noto name comes from the project's mission, 'NO Tofu'– eliminating the tofu-like boxes ( ) that appear when no font is available for a user's text. Noto offers fonts for 146 scripts (writing systems) and over 800 languages. For more about Noto fonts and how to use them, see here.

Inspiring Stories
(Case studies)

1 Tecnologías Indígenas Comunitarias (Indigenous Community Technologies)
Mexico

- **Languages:** Zapotec, Ayuuk, Mixtec, Tlapanec, among others.
- **Practitioners:** Rhizomática, Redes A.C. and Telecomunicaciones Indígenas Comunitarias AC, and Indigenous communities from Oaxaca, Guerrero, Chiapas, Puebla and Veracruz in Mexico.
- **Site:** Rhizomatica, Redes por la Diversidad, Equidad y Sustentabilidad, A.C. and Telecomunicaciones Indigenas Comunitarias, A.C.

Description: This community cellular telephony service follows a model based on a local network acquired, operated and administered by a community with the support of a not-for-profit, civil association of which the communities are members: Indigenous Community Telecommunications.

The community is in charge of the operation of its own network and the users benefit from a cell phone service at affordable costs, ensuring that the income surplus remains within the community to pay back the initial investment and to carry out the community projects that they require. Funds go back also to the not-for-profit association to invest in innovation and training.

Community cellular telephony services help Indigenous and rural communities exercise their right to individual and collective communication.

Indigenous and rural communities started the Telecomunicaciones Indígenas Comunitarias Asociación Civil (Communitarian Indigenous Telecommunications – Civil Association) (TIC, A.C.) in 2011. In 2016, they obtained the first Indigenous social legal concession in the history of Mexico to acquire, operate and manage autonomous telecommunications and broadcasting networks, which today covers five states: Oaxaca, Guerrero, Chiapas, Puebla and Veracruz.

Inputs & Resources: The community generates its own funds. Indigenous communities in Mexico and other parts of Latin America have generally maintained schemes of collective self-funding. This often happens through voluntary collective work and donations made by community members, and other organizations.

Tools used: GSM* (Global System for Mobile Communication), a mobile network architecture, and different Linux-based **open-source*** components running on commercially available hardware (Base Station Controller, Base Transceiver Station). See more.

Reception: Community telephony has significantly facilitated digital and electronic communication in Indigenous communities. It has reduced geographic distances and brought people closer to their families and their community. It has encouraged Indigenous speakers to use their language in organization and communication processes that are supported by the not-for-profit organization. It has also contributed to family and local economies, helped solve emergencies and even saved lives. It has highlighted the importance of Indigenous self-determination, and framed telephony and internet services as common goods.

To know more:

- TIC A.C. in 2021. Produced by Rhizomatica.
- Historias de la Telefonía Celular Comunitaria. Comic book in Spanish.
- Alvarez Malvido (2020). 'A Participatory Action Research Project: Weaving Technology and Autonomy with Indigenous Communities in Mexico.'
- Al-Jazeera's video-report – Indigenous People Run Their Own Cellular Network
- **See more in the Resources section of this module.**

Inspiring Stories
(Case studies)

2 RACHEL Digital Libraries in Guatemala
Guatemala

- **Languages:** Tz'utuhil, Kaqchikel, K'iche', among others.
- **Practitioners:** Israel Quic, Director of World Possible in Guatemala.
- **Site:** https://mundoposible.org/

Description: World Possible (Mundo Posible) began operations in Guatemala, led by Joan Fuetsch and Israel Quic. RACHEL is a collection of the world's leading educational websites running on a server that does not need internet. This digital library works **offline***, in schools, libraries and parks in rural areas to allow free access to educational materials normally found online. After learning of the digital library in its English version, Fuetsch promoted a Spanish version. Then, Tz'utuhil speaker Israel Quic began to promote its use in schools, libraries and parks in rural areas to allow free access to educational materials normally found online. In 2015 they formed a legal organization 'Mundo Posible Guatemala', which signed an agreement with the Ministry of Education in 2017. They started training Guatemalan primary school teachers in the use of RACHEL as a tool for media and communication literacy in 2019. They created a Teacher Training **MOOC (Massive Open Online Course*** also available offline), which won an Open Education Award for Excellence in 2019.

Tools used: RACHEL (Remote Area Community Hotspot for Education and Learning) is a portable, battery-powered, device that contains copies of educational websites in offline format*. These are a collection of websites packaged for operation on a Raspberry-pi* that does not require internet access. This server emits a Wi-Fi or wireless signal, allowing devices that are within a 35-metre range to connect for free. It works on smartphones, tablets, laptops, and desktop computers.

Inputs & resources: Over the years, Mundo Posible Guatemala has been supported by several international foundations (Bill & Melinda Gates Foundation, Rotary International, Vitruvian Consulting, among others) as well as by the Ministry of Education of Guatemala.

Reception: As of 2021, the organization has benefitted twenty-five libraries, 378 schools, and 73,618 children. It has also trained 3,856 teachers.

To learn more:

- RACHEL content preview
- World Possible – Connecting Offline Learners to the World's Knowledge
- Video – The Librarian
- Offline Open MOOC Award
- Biblioteca Digital RACHEL (in Spanish)

Inspiring Stories
(Case studies)

3 New typeface for the Sorang Sompeng alphabet
India

- **Languages:** Sora or Saura.
- **Practitioners:** Sony Salma.
- **Site:** Not applicable.

Description: Indian type designer Sony Salma created a new **typeface*** for the Sompeng script in 2012. The alphabet was already included in **Unicode*** in 2012. Salma created her typeface based on online and library research, and then collected feedback from Sorang Sompeng alphabet users. The typeface was later broadly used in print and digital publications. In 2020, Salma began working on a new typeface.

Tools used: Salma traced the visual style of the characters and placed them on an existing **OpenType Font (OTF)*** by replacing the existing glyphs. The font was mapped on the **American Standard Code for Information Interchange (ASCII)*** encoding.

The word 'Sorang Sompeng' in Sora Sompeng script by Rishu Shukla.

Inputs & resources: The project was carried out independently by Sony Salma, a student pursuing a master's in design at the Indian Institute of Technology (IIT) Bombay.

Reception: She offers the following testimony: 'The **typeface*** that I made back in 2012 is used by many on their computers. Google's Noto Sans Sora typeface is underway and existing cross-platform input tools like Keyman Sora Basic keyboard can be used to type in Sora. Meanwhile, I invited some of the community experts to review my second typeface, and it is going to be available soon. The Sora community will have multiple good quality and modern **Unicode***-compliant typefaces to choose from.'

To learn more:

- Read the full interview and project description written by Subhashish Panigrahi for Rising Voices.
- 'Digitization* and revival of tribal script, Sora Sompeng'. Sony Salma describes the research that led to the development of her typeface proposal.

Tools & Resources

Key Resources

- 'Check before you tech' is a guide designed by the First Peoples' Cultural Council to assist 'language team leaders and coordinators in Indigenous communities who are considering language apps or software to help with language revitalization'. The guide is a checklist that makes recommendations based on the goals that practitioners pursue in their work. The importance of the guide in relation to this approach is that it prompts language defenders and promoters to ask questions about **Accessibility*** and **Usability*** (see Glossary).
- **Redes Comunitarias en Colombia** – Methodology: This wiki page offers a step-by-step planning methodology based on what Colnodo A.C. has learned during the implementation of community networks, the elements that have nurtured the work of other friendly organizations, and the processes of community networks around the world that have shared their experience in different ways with them.
- **Argentinian AlterMundi's Guide to Planning a Free, Decentralized and Community-Managed Network** and to Participatory Mapping to Set Up a Community-Managed Network (both in Spanish)
- REDES A.C. and T.I.C.'s Community Cellular Technology Manual (in Spanish).

Practical resources

- The FirstVoices Keyboard App contains keyboard software for over 100 languages and includes every First Nations language in Canada, Australia and New Zealand, plus many languages in the United States of America. When the FirstVoices Keyboard app is installed on a mobile phone or tablet, any of the 100+ custom keyboards can be activated in any application on the device. Users can select their keyboard(s) of choice within their email, social media, word processing or other apps, enabling unlimited communication in their mother language.
- Cherokee Script Keyboard
- How to type Cree syllabics on a Chromebook
- Unicode characters apps
- Google Noto fonts
- Keyman software documentation
- Rhizomatica's Wiki to Set Up a GSM Radio Access Network (in English and Spanish)
- Coolab's Wiki to Set Up a Mesh Network (in Portuguese)

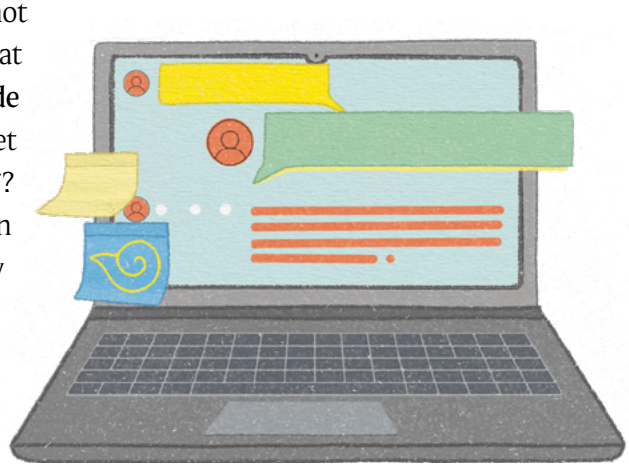
Toolkits

- Translation Commons' **Indigenous Languages: Zero to Digital.** A guide to bring your language online
- World Possible Wiki: Resources for Implementing RACHEL-based Projects.
- RACHEL Training MOOC* (in Spanish). This is aimed at primary and secondary level teachers to turn RACHEL into an information, consultation and learning tool and to strengthen pedagogical practices.
- Media and Information Literacy (MIL)* for Teachers. This website provides access to an international, multimedia and multi-language media and information literacy (MIL) teaching resources tool for educators, researchers and individuals. The tool contains interactive and intercultural teaching resources proposed for use in formal and non-formal educational settings. The resources can be shared, adapted, used and re-uploaded by users. Available in English, French, Spanish, Russian and Arabic.
- **MIL Massive** Open Online Courses*. To increase access to MIL training, UNESCO has supported the development of Massive Open Online Courses (MOOC) on MIL in multiple languages, in cooperation with different partners. This website offers MOOCs in English, French and Spanish.

Learning tasks and activities

Find out about the internet and telephone connectivity, as well as the digital technology that is available to speakers of the relevant language. Apart from the conventional presence and uses of the internet and computers, take a moment to consider and investigate how people use other types of devices, like smartphones, in creative ways. For example, are people taking pictures or videos of cultural activities even when they do not have internet or phone signal in their communities? Do they use their mobile phones in the guise of computers? How and where are they able to connect, send and receive messages if they do not have good connectivity? What is the speed/frequency with which they can access the internet? These constitute a few factors among other important elements that could inform future strategies to solve the challenge of accessing the internet.

Identify the resources that are available to write in the relevant Indigenous language online. Does the language require special characters, or is it written with a special alphabet? Are these characters or script easy to find in a regular computer or smart phone? Or does one need a special app, **plug-in*** or **add-on*** to be able to write the language? How are people solving the challenge of using an alphabet that does not have a **Unicode standard***? Are there many **typefaces*** that one can choose from if the language already has a **Unicode standard***? Does one know who can help one get the alphabet used to write the language to obtain a **Unicode standard***? Does one know how to enable special characters to write in the language? Do members of the linguistic community know how to enable these characters and script on their different devices (computers, tablets, smart phones)? What kinds of campaigns or trainings are necessary to share this knowledge?



Diagnose the level of digital literacy* that exists among Indigenous language-speaking children and youth of the community. Are schools in the region or community connected to the internet? Do they have access to key digital information and media for education? Are Indigenous language-speaking teachers trained in the use of these technologies? How many Indigenous language speaking young people and children in the linguistic community know? How to find appropriate information for their own education online? How much digital information in the Indigenous language is available to or used in education aimed at school children and teenagers in the community or region? How important is it for Indigenous language-speaking young people to be able to demonstrate a certain level of **digital literacy*** to potential employers in the region? What is being done to increase access to digital training in the community and region for Indigenous language users?

Investigate viable ways to improve the internet and telephone connectivity for the community and/or region. The community and region are probably already connected to the internet or are covered by mobile telephone companies, but: how stable is the connection to the internet or to telephone signals? What speed can people get, and is it constant? Can people buy a data plan and is it 3G, 4G or 5G? How affordable are these connection packages for Indigenous language users? If the community or region is not connected to the internet or is not served by mobile telephony companies: what are the main reasons this is not happening? How could awareness be raised within the government or private sector to encourage more investment and connect the community or region? Or is there a strong and organized community base that could initiate a self-managed internet and telephony network?

Consider ways to promote Media and Information Literacy (MIL)* in the community. MIL provides answers to the questions that we all ask ourselves at some point. How can we access, search, critically assess, use and contribute content wisely, both online and offline? What are our rights online and offline? What are the ethical issues surrounding the access and use of information, and how does linguistic **accessibility*** factor into this? How can we engage with media and ICTs to promote equality, intercultural and interreligious dialogue, peace, freedom of expression and access to information? Which languages are present in (or absent from) digital resources and online spaces? Knowing how each language carries its own specialized body of knowledge, how does this distribution reflect a lack of linguistic, and by extension, cultural diversity in these online spaces? And in this case, what are the measures that we can take to promote multilingualism and Indigenous language use online?

Measuring impact

Strategies to evaluate the impact of your digital engagement project or initiative in this area are subject to variation but could for example involve the following:

Availability of internet connectivity in indigenous contexts

If your project or initiative focuses on increasing **accessibility*** of these digital services to Indigenous language users (speakers and signers), its impact could be measured by compiling statistics about the numbers of individual users, disaggregated by gender and age, as well as by devices and geographic areas covered by such services. There are, however, other ways in which the level of connectivity could also be gauged. These could be, for example, surveys that report on:

- Institutions such as schools, hospitals and government offices that offer free internet
- Identification of public parks, internet shops, and other connectivity providers available

- Catalog of non-conventional uses for digital devices that do not require connectivity
- Types of devices, performance level and maintenance issues (also, if they are being replaced by new models and at what speed)
- Indigenous language-speaking children, young people and adults enrolled in **digital literacy*** programs

Conducting such surveys at different moments of the relevant program (for example, two years after its beginning) could be helpful to understand the progress made, and also to identify further areas of need and intervention.

Digital availability of indigenous alphabets

Once the Unicode standard* has been developed and **typeface*** becomes available via Keyman or Noto fonts, the impact of this project or initiative could be measured by surveying and compiling media that actively employs the alphabet such as:

- Printed books, magazines or newspapers
- TV programmes or online videos and animation
- Urban signage or linguistic landscapes
- Advertisement or billboards
- Social media use and publications

Evaluating the sustainability of the community network

Finally, more and more communities and regions, especially those where Indigenous languages are spoken, are looking for ways of creating their own self-managed internet networks. The impact of these new networks can be significant, but they also come with a series of new challenges and difficulties. The majority of these are related to training and technical maintenance. A key element is the long-term sustainability of the project as a community effort. Telecomunicaciones Indígenas Comunitarias Asociación Civil (TIC) has identified a series of common technical problems facing community networks in Mexico: in relation to sustainability, they propose to pay attention to the following aspects:

- How funds can be guaranteed to support these community networks, both from within and without the actual communities in charge of them.
- How a favorable ecosystem can be created to support these community networks, one that facilitates access to essential national infrastructure and that takes into account the social service provided.
- How research to further develop the technology that helps maintain these community networks can be promoted.
- How a new legal system can be created to protect the services provided by these networks as well as the rights of their users.

Module self-assessment

This is the end of our Facilitating approach module. To have a sense of whether one has completed the learning objectives of this module, we recommend that the reader consider the following questions:

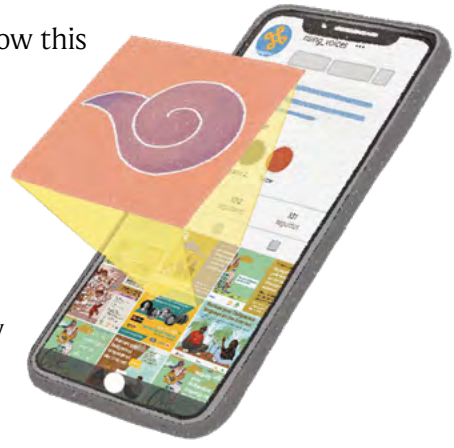
1. Can one identify now the main infrastructure that is available to the community and that relates to the digital revitalization project that one is planning?
2. Is it clearer what are the pros and cons of using digital technologies in language revitalization projects where internet and mobile telephony are not readily available?
3. Does one now have a better picture about the level of digital literacy* that is necessary for the digital language revitalization project to have an impact in the community?
4. If the language is written with an alphabet that is not usually pre-installed in the most common digital devices (computers, smart phones, tablets); does one know what are the potential solutions to implement special scripts to write the language in them?
5. If the community is not well served by public or private internet and telephony providers; does one know what are the potential solutions for these connectivity issues, digital communication networks and common digital devices?
6. If the community finds that they would like to implement their own, self-managed internet and telephone service; are the economic, technical, infrastructural and training aspects related to such project clear? Do you know who can provide support to such an initiative?

Key approach 2: Multiplying
indigenous language content online

This approach is the most commonly identified with digital engagement in favor of Indigenous languages, especially by mainstream media. It seeks to promote a greater visibility of Indigenous languages online through the posting of photos, videos, sound recordings, tweets, dances, songs, etc., that convey short messages often using **performance*** skills, humor, and aesthetics associated with the work of internet celebrities or **'influencers'***.

Learning objectives

This module discusses various activities that Indigenous digital practitioners carry out as a key approach to increase the production and circulation of Indigenous language content.[17] The exploration of this approach can be used as a training unit for future Indigenous language digital defenders and promoters. At the end of this training unit, Indigenous language promoters will be able to:



- Recognize what makes certain online content spread easily and how this can help gain more visibility for Indigenous languages online
- Appreciate the importance of collaborating and networking with other Indigenous language creators
- Consider the pros and cons of the role of social media '**influencers***' in the promotion of Indigenous languages
- Organize their communication strategies online to increase visibility of Indigenous language content
- Find the most appropriate tools and resources to create interesting, unexpected and entertaining content
- Learn from the responses that their communication strategies receive in social media

Discussing this approach

The majority of people who seek to engage with digital technologies to promote Indigenous languages see their contribution as the production and sharing of media (text, images, videos, audio, etc.) in Indigenous or other languages. Why is the multiplication of Indigenous language content significant as a key approach? Given the predominance of a handful of languages on the internet, Indigenous, minority and under-resourced languages seem to have a reduced chance to make themselves visible or heard. However,

[17] This approach was originally discussed as 'viralizing Indigenous language content'. It was deemed, however, that 'viralizing' conjured strong historical images. The strategic choice then became 'multiplying Indigenous language content' with viralization discussed as one characterization of the rapid spread of digital messages online.

when a certain linguistic content becomes popular overnight, this creates a momentary recognition of their presence online. This could have a multiplying effect among speakers of the same language, who feel encouraged to produce new content and media in their languages. Such was the intention of the experiment conducted by the Mobile Language Team, from Australia. They trained Anil, a Nunkunu language user, to produce quick and easy videos to share ten words during ten days over a period of two weeks. This exposed Nukunu to 20,000+ more people around Australia in a short period of time.[18]

Spreading quality digital content

What makes a content popular? Content spreads faster when online content (video, image or textual information) is imitated and/or reproduced by a large number of internet users in a relatively short period of time. There is no recipe or fixed rule to turn online publications into content that spreads fast but some online tutorials can be consulted on how to go about in multiplying content. For instance, popular social media posts tend to be those that carry a certain positivity and that are able to instill good feelings. Other contents become popular because they are judged informative, revealing, practical and/or useful by others.

Role of influencers

Other content could be perceived by internet users as important and shareable because of the public image of the person who posts it. This is why the impact that internet content creators have on their audiences is increasingly understood in terms of the 'influence' they exert, which is also the reason they are called or known these days as 'internet celebrities' or '**influencers***'. Although the vast majority of these new public figures seek to increase their number of followers and 'likes' merely for commercial purposes, more and more Indigenous digital practitioners are employing similar means to promote social change, human rights and other causes. In the last year, mainstream media picked up a few stories about the emergence of Indigenous social media '**influencers***', especially in North America, the Andean region, and Brazil.[19] There are important differences in the type of content that these creators produce. Some focus on tradition, others on politics, and only a few of them focus on language. What they all have in common, however, is that their work shines a light on the contemporary and diverse experiences of Indigenous people. Much of the impact that this approach could have, however, depends on a combination of factors, including the breadth of the networks in which they participate, their creativity, how they connect with current events, and crucially, sheer luck.

[18] Read more about this experiment and watch Anil's videos.
[19] Check: Native Tiktok is preserving and showcasing indegenous culture, Creadores indígenas- populares de contenido digital and "Influencers" indígenas en Brasil: Tradición y modernidad.

Popular digital content

The circulation of popular digital content in the form of **"memes"*** as an internet phenomenon in online spaces and messaging has seen a marked increase in the past decade. These can be understood as digital units of communication that combine text and image, but also in some cases video and **performance***. What defines this form of internet popular digital content is not so much what they are, but the form in which they are reproduced and circulated: a smart idea, a funny statement or a stunning routine is produced and soon after copied, passed on, modified and/or re-utilized by dozens, hundreds or thousands of users online. When used correctly and with intentionality, popular digital content can act as valuable tools for Indigenous digital practitioners by virtue of their accessibility and appeal to large audiences -- in other words, for their democratizing effect. In this vein, marking their popularity, Indigenous content, including **"memes*"** published across different platforms (Facebook, Pinterest, Twitter, WhatsApp, Instagram, etc.), have proved a key tactic to attract attention, to promote social change and to raise linguistic awareness, broadening the reach of Indigenous digital practitioners and allies.

This content is characterized by a high level of engagement by internet users and tends to be not only reproduced and shared but to generate responses and modifications as well. Although most Indigenous popular indigenous content tend to employ major languages (for example English, Spanish, Portuguese, French, Chinese, or Russian) to convey their message, a growing number are used to encourage (especially young) speakers and non-speakers to connect with their Indigenous languages. They do so by repurposing images and phrases associated with popular films or TV series.[20] To harness and promote Indigenous digital practitioners' curiosity and talent, a coalition of language revitalization organizations launched the Mother Language **Meme*** Challenge in 2018.[21] More recently, **memetic videos*** have become the most popular form of digital content which tend to converge on specific platforms such as YouTube, Snapchat and TikTok.

Multiplying content in and about Indigenous languages is of primary importance. Frequent publishing of language content can make non-speakers more responsive to Indigenous linguistic and cultural expressions, which provide the potential for wider dissemination of Indigenous texts, images and videos. On the other hand, whenever linguistic content becomes popular, this results in greater attention to, and greater visibility of those Indigenous, minority or under-resourced languages, which could translate into greater engagement of other language users. The most evident consequence (and symptom) of the popularization of certain Indigenous language content is a sudden and significant growth in the number of 'followers' that a social media project or personal account could register. As a caveat, while multiplying linguistic content could result in the languages being more present in the public sphere, this will not necessarily translate into greater transmission or learning. However, this could well be the first step towards creating a more interested audience and learning community of the language.

[20] Check Quechua Memes and Mohawk Language memes.
[21] See Mother Language Meme Challenge and The Mother Language Meme Challenge 2018.

Inspiring Stories
(Case studies)

1 Kimeltuwe – enseñanza y aprendizaje del mapudungun
Chile

- **Languages:** Mapudungun.
- **Practitioners:** Víctor Carilaf and Fiestóforo.
- **Site:** Kimeltuwe Facebook, Youtube, Instagram, Tiktok and Twitter.

Description: The collaboration between Víctor and Fiestóforo began in 2015. The content produced within this project was from the very beginning intended to be pedagogical, since Víctor is a primary school teacher. They harnessed the possibilities that digital media offer to combine visual information, sound and movement. Although the project began on Twitter, it has been on Facebook where they have reached their largest audience (as of 2021 they have more than 216,000 followers in this network). *Kimeltuwe* went viral when they published a *Mapuche interpretation of the commonly used 'emoticons'*. This received attention from other Facebook users and the media in Chile who reported it as an eye-catching way of promoting the language in a didactic way that makes it more entertaining. Their social media shows an impressive archive of Mapuche language content that can be used by teachers in the classroom as well as by anybody else who is interested in Mapudungun. They have also created high quality, printed copies that people can buy online to support their work.

Cartoon of Mapuche young students under the licence CC BY-SA 4.0 DEED

Inputs & Resources: Kimeltuwe started as a voluntary project. It continues to work with the contributions and support of the public.

Tools used: They develop most of their work with **free and open-source software (FOSS)***, for instance: *Inkscape* and *GIMP* for image editing, *Openshot* and *Synfig* for video and animation, and *Audacity* for audio.

Reception: The project continues to have its largest audiences on Facebook, Twitter and YouTube. It is, however, the impact that it has had on other Mapudungun educators and content creators which is more significant. Kimeltuwe's content and materials are quickly reshared and printed out to be used in the classroom by Mapudungun language teachers.

To learn more:

- 'Profe le puso kultrún a la carita feliz', Newspaper La Cuarta (in Spanish).
- Kimeltuwe (in Spanish).

Inspiring Stories
(Case studies)

2 Quechua memes
Peru

- **Languages:** Quechua (Chanka variant).
- **Practitioners:** Marisol Mena Antezana (Chaska Kanchariq and Josefa Antezana.
- **Site:** Quechua memes Facebook, Sentimiento Quechua Facebook, Chaska Kanchariq Facebook, Twitter, Youtube, Instagram and Tiktok.

Description: They began publishing visual **memes*** in Quechua on Facebook in 2015, yet they had started creating and sharing Quechua content two years before in a different page, 'Sentimiento Quechua' (Quechua Feelings). The two pages contain diverse content, including images, photographs and videos. The content produced in 'Sentimiento Quechua' resembles greeting cards, whereas 'Quechua Memes' relies more on comedy. The project is open to contributions from Quechua speakers and receives a steady stream of suggestions to create new memes. **Memes*** showcasing popular traditions as a main theme have proven very popular, however the most salient feature of these memes is inevitably humor. More recently, Sentimiento Quechua have been publishing memes with sound. In addition to the production of sound memes, the video meme is another format which receives a greater degree of audience attention.[22]

Inputs & resources: Quechua Memes began as a university thesis project but has continued as a personal initiative. It does not have external funds or sponsors.

Tools used: **Meme*** creation online sites, like Meme Generator and PicJoke.net. They have also worked occasionally with slide show presentation software (like Microsoft PowerPoint or Keynote), when they need to edit longer texts.

Reception: They have been well received by young women (18–24-year-olds), and men (25-34-year-olds). The project has several social media accounts (including Instagram and TikTok), but Facebook continues to be the platform where they reach their main audience.

To learn more:

- A description of Quechua Memes from 2016 (in Spanish).
- An interview with Marisol Mena from 2020 (in Spanish).
- Interest in learning Quechua on social media increases during the pandemic (in Spanish).

[22] See video.

Inspiring Stories
(Case studies)

3 #SpeakGwichinToMe
Canada

- **Languages:** Gwich'in.
- **Practitioners:** Jacey Firth-Hagen.
- **Site:** # Speak Gwich'in To Me Facebook, instagram, Twitter, Youtube and Tiktok.

Description: In 2015, Jacey heard about the work that the Sámi in Northern Europe were doing to promote their language in social media with the hashtag #SpeakSamiToMe. She felt inspired and started to produce content in her own language, by posting photos and images with captions, and tagging all of these with #SpeakGwichinToMe on Facebook and Instagram. This led to the creation of the Facebook public group 'Gwich'in Language Revival Campaign' which today has more than 1,300 members. The content shared in all social media platforms helps members of the Giwch'in diaspora to relearn their language, especially with the pronunciation. But it is also the personal touch and attention that Jacey devotes to those who make contact through social media which explains the impact that her work has had. She has also stressed the importance of talking to and consulting the Giwch'in elders as part of the process of re-learning and sharing the language online. This also inspired similar campaigns among other First Nations of Canada, for example, #SpeakTlichoToMe and #SpeakCree, among many others. This initiative has also connected with other efforts in the Northwest Territories to teach the Gwich'in language.

Inputs & resources: The campaign was inspired by contacts with members of other Indigenous peoples of the Arctic Circle.

Tools used: The content produced mainly employs editing tools that are native to the platforms.

Reception: The campaign has inspired other Gwich'in speakers and learners to produce their own content. Local and regional authorities have also embraced this effort and started their own campaigns in correspondence and dialogue with #SpeakGwichinToMe.

To learn more:

- #SpeakGwichinToMe: Using social media to reclaim language
- Meet Jacey Firth-Hagen, the host of the @NativeLangsTech Twitter account for May 30-June 5.
- Johana Luna. Speak Gwich'in To Me documentary.
- Voices from here: Jacey Firth-Hagen.

Tools & Resources

Although it is difficult to predict the potential degree of traction associated with content involving Indigenous languages, there are resources and toolkits offering practical suggestions on how to create more engaging content. Many of these come in English but can be easily translated into other languages using utilities like Google Translate, or Bing Translator.

Key Resources

- Instagram Activism. This resource focuses on strategies available to digital practitioners to promote social change messages on Instagram, and shows how the algorithm and modes of engagement on this platform can be harnessed for the benefit of important causes.
- Using slideshows on Instagram. This resource discusses a new trend registered on Instagram that uses slideshows and branding aesthetics to communicate complex issues. Of interest for language defenders and promoters, too.
  These provide step-by-step instructions that are useful to:
- Edit Images using GIMP.
- Here, Kimeltuwe's illustrator Fiestóforo has published several tutorials to create and transform images using GIMP and Inkscape.
- Use Meme Generator.
- Make a video meme.
- Make a slideshow for Instagram (in Spanish).
- Make GIFs with CANVA.
- Make an animation with Synfig.
- Make an animation with Animaker (in Spanish).
- Make an animation with Powtoon (in French).

Social media toolkits

Promoting Indigenous languages is not just about sharing good looking or flashy linguistic information, but perhaps most importantly about changing social attitudes towards those languages and the communities who speak them. That is why developing an influencer*'s power could be of use. Campaigners have put together basic toolkits to use social media for change. See, for example:

- Tools and Tactics ForAChange.

Focused on progressive causes, the platform has advice on content creation, planning, video and hashtag use, networks and narratives.

Learning tasks and activities

1. Identify the most appropriate sources, tools and resources to see who is already creating or publishing content in the relevant language.

a. Go to Indigenoustweets.com and search for the language in the list. Click on the name and one will be redirected to the list of people who are tweeting in the language. On the right-hand column one will find some trending topics associated with the language.

b. If one knows other **tweeters*** who are not listed, they can be added in the section 'Anyone missing?'

c. Do a quick search using some of the most common words in the language – for example, its proper name, or valued terms like 'voice', 'community', 'conversation', etc. One can also use known hashtags related to the language and filter the content. This can be tried on different social platforms.

d. One may wish to check whether the people who are posting content in the language or family of languages are following other similar figures or pages. If interested in the content they are presenting, do not hesitate to follow them and expand the network of online resources and creators.

2. In order to appreciate and integrate meaningful inputs from Indigenous languages creators, begin a conversation with other language users (speakers and signers) and other actors involved in the production and dissemination of digital content.

a. Once one has located an online community, one may choose to interact with them. If one finds their content interesting, relevant, impressive or instructive, one can repost it, making sure to acknowledge the source (this is basic online etiquette).

b. Ask them questions in or about the language: find out what they are interested in, comment on current events or anniversaries, quiz them about cultural or language material, or share new information with them.

c. If colleagues consider it appropriate, create or select but use the same hashtag all the time. Be careful to choose a hashtag that is not being used for other purposes.

d. Another good tactic is to use several hashtags that connect the campaign with trending topics that are current, or that link to content that interests other people.

e. If one wants the content that colleagues are creating to be an opportunity for people who are not speakers to become interested in the language, consider ways of captioning the content.

3. Maintain a constant interaction with the networks and audience.

a. Apart from posting regularly interesting, informative and useful content about the language, it is also a good idea to maintain a personal rapport with the members of the network.

b. One can do this by responding personally to their language doubts and questions, by sharing personal experiences with them, or by planning Q&A live sessions.

c. Annual celebrations and commemorations are good times to begin or to restart the use of hashtags and campaigns.

d. More and more **memetic*** content these days is associated with 'challenges'. Think of something fun that brings people together. If there are popular songs in the language, lip-syncing videos or dance routines could be a good choice.

4. Develop a plan based on the networks and audiences that one has already identified.

a. Observe what type of messages or content are helping to achieve greater visibility for the language (one can focus on people's responses or engagement).

b. Make a timeline or schedule for an effective social media campaign throughout the year.

c. Integrate work for Indigenous language promotion across several platforms, after considering how different media work differently depending on whether one is using Facebook, Webbo, Twitter, WeChat, Instagram, YouTube or TikTok.

These are just a few of the learning activities that could help activate social media accounts with new and stimulating content.

Measuring impact

Having an approximate idea about the effect or impact of digital communication strategies should be an important consideration when developing a long-term strategy for the revitalization or strengthening of the language. However, given the complex nature of language displacement or loss, it may be necessary to use several means of assessing such impact.

Quantitative impact. Strictly speaking, a clear indicator of spreading of messages is the number of positive reactions, reproductions, and reposts that the relevant media posts receive across different platforms. An important barometer of 'influence' that is often used in social media is also the number of followers of an account, 'handle' or personality. An 'official certification' on the part of the platform is also considered a reflection of the attention that these **online personae*** attract. All these are good measurements of social media presence but ones that tell us very little about whether people who 'like', 'repost' or copy our popular digital content are really learning the language and transmitting it to their children. It should be made clear that this specific approach is not about **Educating** (this is discussed and examined elsewhere), but about increasing awareness and curiosity about the language online. And, yet the quantitative impact of language content posting often translates into other processes.

Measuring and maintaining engagement. While some online publications quickly reach thousands of 'likes' and 'reposts', only a very small number of those responses will probably transform into a constant interaction with Indigenous language defenders and promoters. When this happens, the effects could be evaluated by the type of engagement this generates. This could be both positive and negative. Positive responses translate into follow-up questions, exchange of information, and even 'corrections' or counter examples. A good way to learn from these responses is to integrate these interested audience members into the collective effort of promoting the language online. For example, the 'Quechua Memes' project asks their followers for suggestions to create new popular digital content, and '#SpeakGwichinToMe' takes the time to clarify questions about pronunciation that are posed to them. Whenever this happens, that can be considered a measurement of engagement.

Symbolic impact. Some of the effects of multiplying and popularizing Indigenous language content may not be directly associated with the project itself. These could, however, be linked by the acknowledgement that other initiatives give them as sources of inspiration or as a noteworthy example of what can be done with and for the language

online. This recognition could be conferred by mainstream media (newspapers, radio programmes, TV stations) but it is even more significant when it comes from members of the community or other Indigenous peoples, as happens with our three Inspiring Stories. This symbolic effect could also lead to the tangible formation of networks of Indigenous language content creators.

Offline effects. Finally, another good measure of impact is whether the greater visibility of the language online has any effect on the offline teaching and transmission of the language. An unexpected effect of the Kimeltuwe project was that primary school teachers in the Temuco region in Chile started to print out the images and materials posted online to use in their classrooms. The #SpeakGwichinToMe campaign inspired the Education Commission of the Northwestern Territories of Canada to renew their grassroots efforts to teach the language to the younger generation. These are very clear forms of impact that can be attributed to the greater visibility of the language online, but more importantly of the prevailing personal investment and interest that speakers have in its preservation.

Module self-assessment

This is the end of our Multiplying module. To check if one has completed the learning objectives set out at the beginning, please, consider and answer the following questions:

1. Is it clearer how and why some online content spreads fast and how one can use these ideas to gain more visibility for one's Indigenous language on the internet?
2. Can one find or identify a type of popular content or a **memetic*** video that could potentially be used as an inspiration to promote the Indigenous language?
3. Can one point to two or three interesting elements in the Inspiring Stories that one can use in one's own work?
4. Is it clear where to find and how to collaborate with other Indigenous language content creators?
5. Can one mention one positive and one negative aspect (pros and cons) of social media 'influencers' work in relation to Indigenous languages?
6. Can a special date or anniversary in the annual calendar be identified that could be used to launch an Indigenous language campaign online?
7. Is it clear how the tools or resources mentioned in this module could be useful for Indigenous language defense and promotion? Is it clear where to find other tools and resources if needed?
8. How can one measure the impact of multiplying Indigenous language content and use this information to maintain and improve interactions with online audiences?

Key approach 3: Normalizing

the use of Indigenous languages online

This approach aims to strengthen familiarity and presence of Indigenous languages in and through digital technologies and platforms. It takes the form of '**localization***' of software and platforms like Firefox or Wikipedia, but it is also recognizable in the creation of Indigenous language-focused news portals, digital radio stations, or YouTube channels. These projects work in tandem with the initiatives described in the **Facilitating** section, especially the implementation of keyboards (not just through software or **plug-ins***, but also physical accessories) to type languages in their own script. The **Normalizing** approach is what linguists also describe as 'expanding the **linguistic domains*** of Indigenous languages'.

Learning objectives

- To understand what is seen as **'normalization*'** or **'mainstreaming*'** of an Indigenous language and why this is important for its revitalization and strengthening.
- To identify the importance of having **localized*** versions of common digital platforms and software in Indigenous languages as a form of **'normalization*'.**
- To identify the opportunities offered by online communication and digital platforms to increase the number of media outlets for Indigenous outlets, i.e., digital radio, digital TV, podcasts, etc.
- To identify the most common challenges that are associated with the quest to **normalize*** the use of Indigenous languages in online, digital communication.

Discussing this approach

Normalization of languages

What is 'normalization' of a language? Is it the same as **standardization***? The term **'normalization*'** is used in sociology to describe a process through which certain practices or principles come to be perceived as 'normal' by the majority of society. When it comes to the revitalization and strengthening of Indigenous languages, 'normalization' can be understood as the 'mainstreaming' of languages.

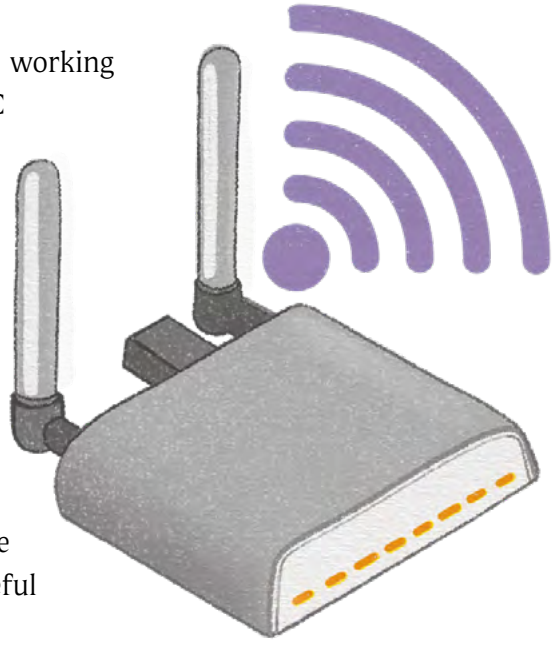
'In the language planning paradigm, **'mainstreaming*'** refers to the appropriation by speakers of their own language and the universal acceptance of the use of the language as a matter of course. [...] Mainstreaming occurs at various levels: first, by increasing

the number of opportunities to use Indigenous languages in private and public life – not only in academic institutions and public services in general but also in business and private life.' (From Terraza, Tipi and Daveluy, 2020, p. 10).

Yet, another way of referring to '**normalization***' is by making the use of the language a common feature of everyday life in as many fields as possible, for example when people browse for information online, when they work on their computers or tablets, when they send messages on their mobile phones, or when they communicate in social media.

Why is **normalization*** important for Indigenous language users (speakers and signers)? Speakers of Indigenous and other under-resourced languages rarely have the opportunity to find their languages on digital platforms. As this compelling testimony of Kaqchikel language defender Miguel Angel Oxlaj puts it: 'When I get on the internet, I find more than 90% of the content in English and [perhaps] a significant percentage in Spanish and other languages. [...] So what I have to do is to move to another language, and that favors the displacement of my own language.'

> *'[This] discredits my own language, because – as it is not on the internet – then it is not valid, then it does not work, therefore why am I going to continue learning it? Why am I going to teach it to my children if, when I turn on the internet or television, I cannot find it there?'*[23]



Miguel Angel Oxlaj is one of the team members currently working on the Kaqchikel version of Wikipedia. And he tells the BBC correspondent Miguel Trancozo: his dream is to be able to have a 'digital life in my own language, and when I decide to move to another language that it will be my decision'.

Thus, '**normalization***' of Indigenous languages goes counter to their perception as 'useless', 'incomplete', or 'ineffective' in modern life. Polish linguists Nicole Dołowy-Rybińska and Michael Hornsby say that: 'For a language to be perceived as authentically useful, it very often needs to have a pervasive presence in society – it needs to be seen and heard everywhere – and in that sense, normalized. [...] The **normalized*** language thus comes to be seen as the most appropriate and most useful means of communication in society.' (2021: p. 108).

[23] Trancozo Trevino, Miguel (2020). The many languages missing from the internet. BBC Future. 15 April 2020.

Localization

The forms of digital engagement perceived as promoting the '**normalization***' of Indigenous languages generally take the form of '**localization***', which is the process through which a product or a platform is adapted and translated, to make it usable in a particular country, or in this case, culturally and linguistically appropriate for speakers of a certain language. Indigenous '**localization***' efforts have included common software programs, like the **proprietary*** package Microsoft Windows (or, at least their Language Interface Packs)[24], free open-source* packages OpenOffice[25] and LibreOffice[26], internet browser app Mozilla Firefox, secure **messaging*** app Signal, digital security app Torbot, among others. It has also been done for social media platforms like Facebook, and, more prominently, for crowd-sourcing* digital information sites like Wikipedia.

As of the summer of 2021,[27] there were complete **localizations*** of the Firefox **desktop app*** for about ten regional or minority languages in Europe, two Indigenous languages from Latin America (Guarani and Kaqchikel) and one from North Africa (Taqbaylit). There were also different percentages of localization achieved (between 40% and 75%) for around twenty other languages, including Latgalian, Songhay, Xhosa, Triqui and Mixteco Yucuhiti.

There are only two Indigenous language **localized*** versions of Wikipedia with more than 1 million articles. Both are from Filipino languages: Sinugboanong Binisaya and Winaray. Other language localizations of Wikipedia have more than 100,000 articles[28]. Hundreds of other languages have localized versions of Wikipedia with less than 10,000 articles or are still in the **incubator phase***.

Apart from the more technical aspects involved, **localization*** of digital resources in Indigenous languages involves two important but challenging linguistic processes: language **standardization*** and creation of **neologisms***. Government and higher institution policies are also important in this process, especially with regard to guaranteeing respect for linguistic diversity and Indigenous language users' (speakers and signers) rights. This will be further discussed in the Defending approach section.

[24] https://support.microsoft.com/en-gb/windows/language-packs-for-windows- a5094319- a92d- 18de- 5b53-1cfc697cfca8#lptabs=win10
[25] OpenOffice Wiki: List of native-language names
[26] LibreOffice
[27] Mozilla Firefox
[28] All Wikipedias ordered by number of articles

Standardization

Standardization* is meant to homogenize the ways languages are organized and represented, that is, the 'correct' forms of constructing sentences, the 'right' way of writing words and the alphabet to represent them, among other aspects. Some linguists think that attempts to standardize an Indigenous or other lesser-used languages (almost by definition dynamic and diverse), based exclusively on the most prevalent or predominant version of said language, could lead to the exclusion of other varieties and further discourage people from speaking the language. Therefore, standardization could prove to be a long and difficult process, especially when a language consists of many different variants, like, for example, Zapotec (62 variants), or Mixtec (between 52 and 81 variants) in the case of Mexico, or Quechua and Kichwa (45 approximate variants) in the Andean region. Linguist Sergio Romero has documented the way in which standardization of Mayan languages in Guatemala was developed between the 1990s and the 2000s by the National Academy of Mayan Languages. He focuses particularly on how its K'iche' branch implemented 'a long-winded system of consensual decision-making requiring the participation of speakers from different dialect areas'. He acknowledges that choosing consensus-making is not perfect: 'Consensus is sometimes hard to achieve, and decisions are often postponed or take years of apparently fruitless consultation. Nevertheless, it enjoys widespread and growing legitimacy…' (Romero, 2016: 158).

Another way to promote the **standardization*** of Indigenous languages, especially online, is by compiling large-scale digital archives of Indigenous language texts. This is what the Ulwazi Programme set out to achieve in 2008 for the isaZulu language in the metropolitan area of Durban, South Africa. The programme operates by 'co-creating cultural and historical information with people from local communities.' Fieldworkers from local communities within the eThekwini Municipality are trained to use basic digital media tools and web platforms. They then write – in isaZulu and English – on cultural and historical topics relating to the city of Durban and areas within the eThekwini Municipality. The result is the Ulwazi Programme – a website of locally relevant content in local languages. Ulwazi was originally a library project, but it is now run by the Durban Local History Museums of eThekwini Municipality. [29]

This path to creating a digital **repository*** of information in Indigenous languages is very different to what Zapotec researcher Rodrigo Pérez found in his study of Wikipedia **localizations*** in Latin America. In 2017, he published a report which highlighted that there were only four Indigenous languages with an official Wikipedia page: Quechua, Nahuatl, Aymara and Guarani. Many other language localizations were still in the **incubator phase***, or were just beginning, for example, those of Kaqchikel, Yucatec Maya, Namtrik, Wayuunaiki, and Salvadoran Nahuat. While recognizing the importance

[29] About Ulwazi, Sharing Indigenous knowledge.

of these Wikipedia localizations in what relates to 'normalization' of the Indigenous languages, Rodrigo Pérez's report was critical of the way in which these projects had been created, with marginal participation to virtually zero involvement of actual language speakers. He found, for instance, that one non-Indigenous language speaker had created incubator projects for nearly twenty-six different languages (Pérez, 2017: 24).

Neologisms

As times change and new technologies and ideas come to occupy an important place in everyday considerations, the adaptation of new terms characterizing these developments is of vital importance. In this regard, the **normalization*** of Indigenous languages is strongly tied to the creation of neologisms: new words or phrases that are not yet used regularly by most speakers and writers. This linguistic and administrative process demands a great deal of research, creativity and perseverance on the part of language defenders and promoters. To be successful, the creation of neologisms should ideally involve processes of consultation, several trials and a proper communication strategy.

There are a few systematic approaches to the creation of neologisms. The aforementioned Guatemalan Academy of Mayan Languages has been involved in developing a clear methodology for the creation of new words since the late 1990s. Fischer and Maxwell noticed that two basic principles form the core of this methodology: 1) new words should follow the established forms and sounds of the Mayan languages (morphology and phonology), and 2) that the neologisms should be short ('**lexemes*** rather than phrases') (1998: 70). A successful new term introduced by the Academy was the Kaqchikel and K'iche' word for 'computer', kematz'ib, which translates as 'weaver [of] writing'. Using these innovations, the Guatemalan Ministry of Education published as early as 2003 proposed new pedagogic terms in the following Mayan languages: K'iche', Mam, Q'eqchi', Kaqchikel, Q'anjob'al, Tz'utujil, Poqomam, Poqomchi', Akateko, Ixil and Popti'. The Ministry drew from the work of the Academy as well as from the proposals made by other organizations: the Instituto de Lingüística y Educación of the Rafael Landivar University, and the NGO Oxlajuuj Keej Maya' Ajtz'iib', OKMA. (DIGEBI, 2004).

In 2017, the Ministry of Education in Peru published a document containing a few conceptual and methodological considerations for the creation of neologisms in Indigenous languages. The publication highlights four basic operations through which new terms can be created: invention, expansion of meaning, **lexical reclamation*** and adoption of **loanwords*** ('la acuñación, la expansión de significado, el rescate léxico y la adopción de palabras de otros idiomas (préstamos)'). (Huamancayo Curi, 2017: 33).

Other ways of normalizing

In summary, digital **localization***, language **standardization*** and creation of **neologisms*** are long-term processes that should include careful planning and involvement of the majority of language speakers. Without these two elements, these processes would eventually become testimonial, without any real impact in the revitalization of the language that it is intended to serve.

There are other ways in which digital technologies can also help in the '**normalization***' of Indigenous languages online. These consist of the creation of alternative, oral language-based media that contribute (as highlighted in the **Multiplying** approach) to increase the visibility of languages online.

Because the processes of **standardization*** are more focused on writing, the creation of digital media outlets for Indigenous languages could prove to be much more dynamic. Radio is an important medium of communication for Indigenous peoples. This is because, in many cases, radio receiver sets are the only electronic device that Indigenous families can afford. It also connects strongly with oral forms of knowledge transmission that are important in Indigenous contexts. **Radio wave*** broadcasting is also a relatively low-cost form of communication technology with the potential of reaching a big audience. Since social media platforms increasingly allow **live streaming*** (for example, on Facebook Live or YouTube Streaming), in recent years there has been a proliferation of digital broadcasting experiences – like **internet radio*** stations – but also social media live sessions that contribute to 'normalizing' the presence and use of Indigenous languages online. These and other communication channels (digital newspapers, internet TV, etc.) have thus become a form of **normalization***.

Indigenous radio stations with loyal audiences have started to migrate to the digital realm, but the ease with which internet **live streaming*** can be accomplished (and also the relative freedom with which this can be done) has also encouraged the creation of new radio stations, as is the case of Radio Yúuyum in the Yucatan peninsula.[30]

[30] See Radio Yuuyum facebook page and Radio Yúuyum: Streaming en Maya Desde la Península de Yucatán (in spanish)

Inspiring Stories
(Case studies)

1 Localization of Wikipedia in Dagbani and Atikamekw

Ghana (Dagbanli) and Canada (Atikamekw)

- **Languages:** Dagbanli (also Dagbani, Dagbane and Dagbanle) and Atikamekw Nehiromowin o Nehirâmowin, a variant of Cree.
- **Practitioners:** The Dagbani Wikimedians User Group in Ghana; and more than 100 Atikamekw speakers from Manawan, Obedjiwan and Wemotaci (initially supported by Nastasia Herold) in Canada.
- **Sites:** Wikipedia Baŋsim bayana kundi and Wikipetcia Witamakesinahikan

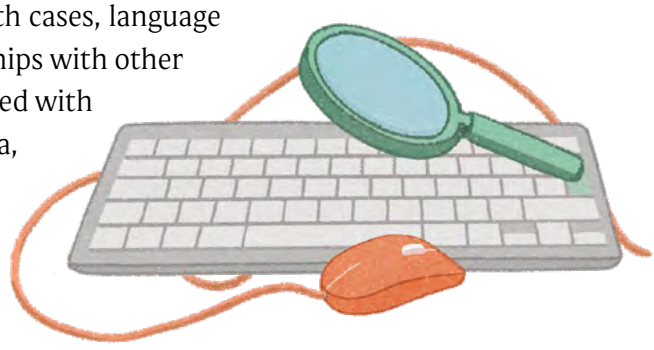
Description: The Dagbanli Wikipedia page had remained a few years in the Wikipedia Incubator, but thanks to the determined work of the Dagbani Wikimedians User Group, between 2019 and 2020, it was officially launched on 30 June 2021. With this launch, Dagbanli joined Twi and Eʋegbe as another Ghanaian language version of the digital encyclopaedia. Sadik Shahadu and Mohammed Sadat Abdulai, members of the Global Open Initiative Foundation, began recruiting language experts and enthusiastic speakers who created the Dagbani Wikimedians User Group (DWUG) in 2020. One of the DWUG objectives is to 'promote awareness of Wikimedia projects related to Mole-Dagbani languages in Benin, Burkina Faso and Ghana'. These languages include Mòoré, spoken in Burkina Faso, and Notre, spoken in Benin. DWUG carries out its work through regular meetings, **edit-a-thons***, editing contests, photographic contests and trips. In 2020, DWUG organized the 'My Northern Achiever Challenge', an open competition to add content about Ghanaian personalities to the Dagbani Wikipedia incubator. This produced more than 200 Dagbani Wikipedia articles.

Atikamekw Nehiromowin is still spoken by approximately 95% of the members of the Atikamekw Nation in Québec, Canada. **Localization*** of Wikipedia in Atikamekw stems from an initiative by Jean-Paul Echaquan and Nastasia Herold, established in Manawan, Québec, in 2013. This involved students from Otapi secondary school, who wrote more than 160 articles. Later efforts were integrated in a project called 'Atikamekw knowledge, culture and language in Wikimedia projects', with the support of the Wikimedia Foundation. Apart from the localization of Wikipedia in Atikamekw, this initiative sought to expand information about the nation on the French Wikipedia (with new photos, archival documents, and maps) and to raise awareness about

Indigenous knowledge and languages. The localization project involved re-interpreting and translating nearly 588 words, concepts and expressions. Speaking about the project, Thérèse Ottawa, coordinator of the project, said that: 'The Atikamekw is a language attached to our territory, the Nitaskinan, [so] it is not enough to translate word by word, it would not make sense for us'. Wikipetcia finally came out of the Incubator on 21 June 2017, an event that was broadcast on local radio. Editing of the online encyclopedia continues through the work of WikiClub Metapeckeka in which Atikamekw elders and young people come together to share their knowledge.

Inputs and resources: Localization of Wikipedia in Dagbanli has been supported by the Wikimedia Foundation, through the Rapid Grants program. The Wikimedia Foundation funds Wikimedia community members to organize projects throughout the year (see more).

The project 'Atikamekw knowledge, culture and language in Wikimedia projects' had a Project grant from the Wikimedia Foundation. In both cases, language users (speakers and signers) have established partnerships with other foundations and universities. In Ghana, DWUG partnered with WikiAfrica Education, University of Education Winneba, Global Open Initiative Foundation, NTV Ghana, Wikimedia South Africa (WMZA) and Moleskine Foundation. Participants in the Atikamekw project linked with Manawan Otapi secondary school, Conseil Atikamekw de Manawan, Conseil de la Nation Atikamekw (CNA), Wikimedia Canada, Université du Québec en Outaouais (UQO), and the Institut national de la recherche scientifique (INRS, Urbanisation, Culture, Société research center).



Tools used: Wikimedia Incubator, MediaWiki, and Wikimedia Commons. For more, see Tools & resources of this module.

Reception: Launching of the Dagbani Wikipedia has been greeted with enthusiasm by the media in Ghana, while its level of use is difficult to assess so far. Wikimedia Canada reports that: 'During the four years of existence of Wikipetcia Atikamekw Nehiromowin, more than 1,500 articles have been written by about 100 contributors. The WikiClub Metapeckeka continues its trainings, but also encourages a host of projects and activities such as Wiki Ciwakamihikan (Wiki Café), Lingua Libre, Nitaskinan en photos, Nanto masinatcikan, and soon, a documentary to encourage other Indigenous people to start their own Wikipedia.'

To learn more:

- Dagbani Wikimedians User Group and Dagbani Wikimedians User Group at Wikimedia.
- Tell us about Dagbani Wikipedia.
- Sarpong, Gideon. 'Dagbanli now third Ghanaian language approved on Wikipedia'. Morden Ghana.
- Atikamekw knowledge, culture and language in Wikimedia projects.
- A Wikipedia Made for—and by—the Atikamekw First Nation in Canada.
- What do you call a homepage? Incorporating Indigenous knowledge into Wikipedia.
- 'A way to keep our language alive': How the Atikamekw Nation uses Wikipedia to promote its language.
- Wikipedia in the Atikamekw language: a look back at an ambitious project that is still in progress!

Inspiring Stories
(Case studies)

2 Localization of Firefoxin Kaqchikel and Triqui
Guatemala (Kaqchikel) and Mexico (Triqui)

- **Languages:** Kaqchikel and Triqui de Chicahuaxtla (Nánj nïnh-ïn).
- **Practitioners:** Juan Esteban Ajsivinac Sián for Kaqchikel and Misael Hernández, José Manuel Hernández Fuentes, Fidel Hernández and Beatriz Montesinos for Triqui.
- **Sites:** Mozilla Firefox in Kaqchikel and Mozilla Firefox in Triqui.

Description: Juan Sián, from Chimaltenango, Guatemala, began working on the **localization*** of Firefox into Kaqchikel, after a few years doing translations for organizational websites. Later on, he worked with the Fundación Wuqu' Kawoq in the localization of Facebook in Kaqchikel, which had a positive symbolic impact among language speakers. He also developed an online Kaqchikel vocabulary hosted by the Academy of Maya Languages of Guatemala. In 2015, Juan Sián finished the trial version of Firefox for Android in Kaqchikel. It took him eight months to translate the 5,000 **strings*** that the localization process entailed. The creation of neologisms for information technology terms in Kaqchikel was one of the most challenging aspects of the localization process.

"Firefox logo, 2017" by Mozilla Corporation is licensed under CC BY 3.0.

Misael Hernández and a group of Triqui speakers from San Andrés Chicahuaxtla began the localization of Firefox in 2015. They wanted to promote language learning among Indigenous migrants and to produce technological resources for primary school teachers in the area. Misael has also worked on translations of Wikipedia articles, blogs and social media. In 2020, the Triqui version of Firefox was available for Linux, Mac, Windows and Endless. One of the main challenges they faced in this localization project was the lack of a **standardized*** alphabet for Triqui.

Inputs & resources: Both localization processes mentioned above have fundamentally relied on voluntary work. Some alliances were made with non-governmental organizations, and significant exchanges and training were obtained through Digital Activism Meetings, promoted by Rising Voices in Latin America.

Reception: This is difficult to estimate as members of the Triqui localization team are in the process of promoting the use of the browser in primary schools of the Latin America and the Caribbean region.

To learn more:

- Follow the progress of localization updates of Mozilla apps, for Kaqchikel and for Triqui.
- The history of Kaqchikel language on the internet (in Spanish).
- Kaqchikel and other Maya languages of Guatemala gain momentum thanks to digital activism.
- Misael Hernández Mendoza – Activista Digital de la Lengua Triqui (in Spanish).
- Meet Misael Hernández Mendoza, host of @ActLenguas Twitter account for March 4-10, 2019
- Mozilla in Triqui (in Spanish).

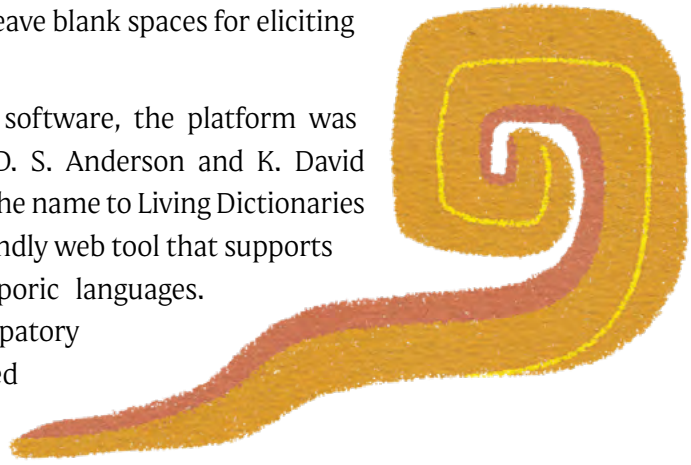
Inspiring Stories
(Case studies)

3 Talking Dictionaries of Micronesia
Federated States of Micronesia

- **Languages:** Chuukese, Kapingamarangi, Koraean, Mokilese, Namolukese (dialect of Mortlockese), Nukuoro, Pingalese, Pohnpeian, and Yapese.
- **Practitioners:** Living Tongues Institute for Endangered Languages.
- **Sites:** Talking Dictionaries of Micronesia, Talking Dictionaries™ at Swarthmore College and Living Dictionaries.

Description: The publication of Indigenous online dictionaries in Indigenous languages, especially those that make use of multimedia, could be used for the normalization of Indigenous alphabetic writing. One interesting project is the Living Dictionary app, a tool created and promoted by the Living Tongues Institute for Endangered Languages. The organization trains language users in the use of this platform in events such as the Micronesia Language Revitalization Workshop, which took place in the Federated States of Micronesia in 2013, with support from the Island Research Education Initiative (IREI) and the Federated States of Micronesia, Special Education Service, Department of Education.

These workshops include audio recording techniques, word and sentence **elicitation***[31], photo elicitation, **lexicography***, and building talking dictionaries. During the event in 2013, fifteen participants representing different linguistic communities set up nine talking dictionaries and tried an interface that allows language speakers to edit and record entries directly as well as leave blank spaces for eliciting or testing words.



Originally known as 'Talking Dictionary' software, the platform was launched in 2006 by linguists Gregory D. S. Anderson and K. David Harrison. The Institute decided to update the name to Living Dictionaries in 2020. The app is currently a mobile-friendly web tool that supports endangered, underrepresented and diasporic languages. Talking and living dictionaries allow participatory editing and are open to everyone interested in the specific language.

[31] A sentence elicitation frame is a syntactic construction that has a blank left in it for eliciting or testing words

Inputs & resources: Technical and financial support for the Talking and Living Dictionaries has been provided by the National Geographic Society, Swarthmore College, the National Science Foundation, and private donors. The Living Tongues Institute for Endangered Languages has partnered with several organizations in different parts of the world, including the Academy of Maya Languages of Guatemala, the Research Library Juan de Córdova in Mexico, the Center for Endangered Languages Documentation of Papua, the Endangered Language Fund, Haverford College, the Max Planck Institute, Moose Cree First Nation, the New York Botanical Garden, the Navajo Language Academy, among others.

Tools used: The current version of Living Dictionaries app is hosted here. See Tools & resources of this module to know more.

Reception: Of the nine Talking Dictionaries of Micronesia, the one for the Nukuoro language currently has 7,247 entries, 1,078 audio files, and seventy-four images. Other dictionaries have different levels of progress. There are currently 218 Talking and Living dictionaries for an equal number of languages, from Achí to Yurt Tatar, created with the Living Tongues platform.

To learn more:

- Micronesia Language Revitalization Workshop.
- Ho Language Talking Dictionary.
- List of Living Dictionaries.
- Living Dictionaries: An Electronic Lexicography* Tool for Community Activists.

Tools & Resources

Key Resources

- Planning linguistic landscapes* for your community (experiences from Manchester, UK).
- How to begin the localization of Firefox in your language.
- Indigenous Languages and Knowledge on Wikimedia Projects Toolbox. This document helps members of Indigenous peoples to develop localization projects on the Wikimedia platform. Developed after a project conducted with the Atikamekw Nehirowisiw Nation. Also available in Spanish, French, Russian, Arabic and Japanese.
- Reading Wikipedia in the Classroom – Teacher's Guides
- How to create a Living Dictionary for your language.
- Dictionary App Builder (SIL). Create mobile dictionary apps with pictures, search and audio. Dictionary App Builder helps you to build customized dictionary apps for Android and iOS smartphones and tablets.
- Aspectos sociolingüísticos de los neologismos en kaqchikel (in Spanish).

Practical resources

- How to Translate OpenOffice.
- LibreOffice Localization Guide.
- Video Tutorial - How to Create a Living Dictionary: A Tutorial with Living Tongues Institute.
- How to create an internet radio station.
- Easy steps to create a dynamic informative website.
- How to host a Facebook Live.
- How to host a YouTube live session.
- Livestreaming on YouTube.
- How to publish your podcast [Basic] and [Advanced].

Learning tasks and activities

Finding out if and what applications and/or digital platforms and software there are in the relevant language. Perhaps one does not know but there may already exist a word processor program, a plug-in* that changes the language of the browser, or a version of the favorite social network in the Indigenous language. Do a search, go for example to pontoon.mozilla.org to find out if there already is a completed localization of Firefox, or Thunderbird in the relevant language. Or check Windows or Mac to see if there is a language pack in the language. Or look at the list of languages that have their official version of Wikipedia. There might be other software and pages that we have not listed here that use the language. Consider downloading the apps, the plug-ins or the add-ons and try to use these versions in daily life.

Organizing a localization* and/or mainstreaming* project in the relevant Indigenous language. Is there somebody in the language community who has the knowledge to begin a localization project? Or perhaps one knows somebody who is not a language speaker but who could help to initiate a localization* project. Discuss with the community or friends what kind of software or platform one would like to localize. Is it the most popular among the language users? Is it a realistic project? There are **free, open-source software*** development projects that one could approach with an idea. Seek allies in the region or context. There are most likely other people who would want to help (cultural institutions, university students and programmes, and even private companies).

Creating neologisms or testing those that have already been created. When planning a **localization*** project, it is important to have a good strategy for the incorporation of **neologisms***, that is, new words to translate the menu options of the software or the platform that one wants to localize. Does one know if a new word for 'file' and 'save' is needed, or if somebody else has come up with an idea to translate these terms in the language? What about 'post' or 'share'? Even if one knows one's language very well, one may want to see whether other language users (speakers and signers) understand the neologisms introduced. It is always good to reach a consensus so that these new forms can be adopted by the largest number of speakers. Remember the two basic principles suggested above: new words should follow established rules and they should be short, not descriptive.

Developing a new media outlet for the relevant language. Digital technologies and the internet are making it easier for people to create their own media. Why not try to begin a project like this to make the use of language more common online? It does not have to be complicated. It can be as simple as a Facebook Live session where friends and family share their opinions on current events. One can create podcasts or a video blog, and also start an internet radio station. It could also be a collective online journalism project, like what Ulwazi did in Durban, South Africa. What is crucial is to use the language online in areas or for purposes that are not frequently associated with it.

Starting or joining a Digital Dictionary with the community. Have a look at the list of languages that already have a Living Dictionary. If the language is not represented, one can create an entry alongside members of the community. One can also try the Dictionary App Builder created by the SIL.

Reading and reviewing the localized version of Wikipedia in the language. If the language already has a Wikipedia version, apart from contributing to the **localization*** project with articles, one could also try reviewing the information that is already in there. The Wikimedia Foundation has begun a project called 'Reading Wikipedia in the Classroom' to help both educators and students to develop **vital media and information literacy** skills. The pilot project in Bolivia (Plurinational State of) used the Aymara localized version, which led to a discussion about the **standardization*** of the alphabet, the adequate use of **neologisms***, and different ways of translating or expressing content in the language.

Measuring impact

Normalization is typically a long process that involves dedication and patience. It is not easy to assess the moment a language has become 'normalized'. A good measure could be, however, to pay attention to some of the similar indices that we used to evaluate the **Facilitating** of digital communication in Indigenous languages, such as:

- Availability of digital books, digital magazines or digital newspapers.
- Availability of TV programmes or online videos and animation.
- Presence of urban signage or linguistic landscapes.
- Advertisement or billboards.
- Social media use and publications.

To these, we should add in relation to this key approach:

- Localization of software.
- Localization of internet platforms.
- Digital radio.

Further to this, an interesting exercise related to evaluating the normalization of a certain language in relation to digital communications would be to investigate how many people make use of the localized programs or platforms that exist in the language. Are people finding it useful? Or are these localizations more symbolic than practical? Why and how are people using these localizations?

Module self-assessment

This is the end of the **Normalizing** module. To have a sense of whether one has completed the learning objectives of this module, please, consider and answer the following questions:

1. Does the reader understand now what 'normalization' or 'mainstreaming' of an Indigenous, minority or under-resourced language means, and why this could be important to language revitalization projects?
2. Has one gained a better understanding about different ways of promoting the 'normalization' or 'mainstreaming' of the language in digital communications, or online?
3. Can steps be identified in order to take action in '**localizing***' a program or an online digital platform in the language?
4. Does one know how one can increase the number and frequency of media outlets in the language in question using digital technologies and online platforms?
5. Can one now think of the most common challenges and appropriate and effective ways to use digital technologies and media to promote the standardization of the language?
6. Have new words (neologisms) necessary for the localization or mainstreaming of new projects been identified? And are the best ways to create these neologisms known?

Key approach 4: Educating

in and teaching Indigenous languages online

While all previous approaches could be said to be potentially educational, a more explicit focus on pedagogical methods and/or dynamics are the defining features of this key approach. It includes the creation of digital or online learning methods, units or interactive apps for Indigenous languages, spoken dictionaries, as well as a systematic sharing of linguistic knowledge building potentially to a certain level of proficiency.

Learning objectives

- To explore the possibilities that digital media and technologies offer for the transmission of Indigenous, minority and other under-resourced languages to the younger generation.
- To consider the challenges that **digitization*** of language education presents to different peoples in different contexts.
- To examine different forms in which digital media can be designed as a tool for formal and informal education in the language.
- To reflect about how different forms of collaboration and networking could lead to a more active role of Indigenous language users (speakers and signers) in the design of digital media and tools for effective transmission and education of languages.

Discussing this approach

Language defenders and promoters have been working for several years on the creation of innovative ways to educate Indigenous children in their own language, many of which, like the **language nests*** or immersion dynamics, have been very successful.

Language transmission and education

Ever since digital media and technologies started to become popular in contexts where Indigenous and other minority languages are spoken, defenders and promoters have become increasingly interested in their potential to support language transmission and education. However, many of the traditional methods and even some of the innovations that were crucial to help the revitalization of languages in the previous period (for example, immersion programmes like '**language nests***') are not as easy to translate into a digital form. As Native Hawaiian scholar, Candace Kaleimamoowahinekapu Galla, aptly discusses: 'The use of digital technologies in Indigenous communities is perceived as a double-edged sword and met with mixed emotions of suspicion, skepticism, but also

hope – raising questions about its benefits and drawbacks' (2018: 104). Indigenous language keepers fear, for example, that constant use of digital media will discourage face-to-face conversation and connection with the land. They are also concerned about cultural control and intellectual ownership, preoccupations that will be discussed in more detail in the **Protecting** approach module. At the same time, digital technologies offer new opportunities to archive, preserve, and document Indigenous languages, as well as have the potential to connect and bring speakers and learners together virtually, as well as physically.

In fact, one of the key uses made by Indigenous language educators of digital technology is for the creation of digital repositories with educational materials. This has facilitated the distribution and reproduction of what are often very limited resources that could have been out of print or simply unknown to interested practitioners. An interesting project documented in 2015 was the website Kichwa.net, which stores and makes available several educational resources for the learning of Kichwa in Ecuador. Similar projects are the East Cree Language resources, the Passamaquoddy-Maliseet Language Portal, the Lenape Talking Dictionary, the Innu-aimun Ressources de Langue, and the Laz Enstitüsü website, among many others.

Educational materials

Language defenders and promoters have also used digital video recording to produce new educational materials, filming themselves teaching the language in the classroom and then publishing these videos online. These are useful ways to harness digital video recording, but they miss out on creativity. Creating language education videos does not require sophisticated knowledge of editing tools or animation to make them entertaining and attractive. One of the Inspiring Stories featured in this toolkit, 'Wayunaaiki para el Mundo', shows that basic editing skills and good humor can make a language class more engaging and impactful.

Animation of tales is often used as an aid for education. The organization Idara Baraye Taleem-o-Taraqi, from Northern Pakistan, has promoted the animation of folk tales in the Torwali language. Videos are also used as an integral part in Anishinaabemowin language education within the project 'Kebaowek First Nation Kids Books'.

In 2020, Jordan Gonzalez Hidalgo created the YouTube channel Xipatlani ('Fly away' in Nahuatl) to teach his language with colorful animated videos aimed at children. He uses Bitmoji and PowerPoint to create visually attractive animations. More and more educators are learning to use these video tools to transmit knowledge and are turning into true '**edutainers***'. This case demonstrates the usefulness of Facebook in teaching Indigenous languages in an organized and pedagogical way. YouTube has in recent years encouraged the exchange of skills and experiences in gatherings where EduTubers meet and it has created a tutorial channel for those who would like to use their platform for educational purposes (see, Tools and resources in this section).

Learning applications and collaborations

The development of language learning applications is another crucial way in which digital technologies are used for explicit educational purposes. These are designed for use on a desktop computer, but more often for portable devices, like smartphones or tablets. Anna Luisa Daigneault, of the Living Tongues Institute, surveyed a range of these apps and platforms noticing that:

> *'The availability of online educational platforms and apps has revolutionized the way people approach language learning today. They can now learn languages online on any device, at their own pace and on their own schedule. People can now study in short, digestible sprints, track their progress easily, and even chat with or hire language tutors in safe, online community spaces. […]'*

Some of these apps have been created through wide-ranging collaborations between Indigenous organizations or alliances, with economic backing from agencies of various types and affiliations. An important example is the FirstVoices apps developed by the First Peoples' Cultural Council in partnership with Mother Tongues. These applications have been designed to teach Coast Salish languages, like Nazko-Dakelh, Xeni Gwet'in, Secwépemc, Northern Sʔáʔimcets, Sliammon, Ehattesaht, Kwak̓wala, Lilwat-Ucwalmicwts, among others. These apps (available for iOS and Android) integrate content that Indigenous language promoters have entered directly on the FirstVoices language documentation platform (discussed as part of the **Reclaiming** approach) and make it available offline. They are updated throughout the year to ensure that the latest content added to a language site also appears on the app.[32]

Daigneault's survey identified five different types of applications. These are:

- Platforms and apps that use a 'college-style classroom-based language curriculum' focus. These are exemplified by Duolingo.
- Platforms and apps that rely on **'live interactive chat, Q&A and social'** transmission. Examples of these are HiNative and HelloTalk.
- Platforms and apps that explore the **'gamification* of language learning'** and 'resemble brain games more than traditional language courses', for instance, Mindsnacks.
- Platforms that allow people to **hire language teachers and tutors,** represented by iTalki and Verbling.
- Platforms and apps **'focused on memorization through flashcards and SRS (spaced repetition*** software)', of which the more popular are Memrise, Duolingo's TinyCards, AnkiApp, as well as Drops, TripLingo and MosaLingua.

[32] FirstVoices Language Apps

A summary of the description and analysis carried out by Daigneault can be found in the Tools & resources of this module.

Of all these, the commercial platform Duolingo stands out for having added Diné bizaad (Navajo) and ʻōlelo Hawaiʻi (Hawaiian) as languages available to English speakers. These courses were developed in collaboration with language users.[33] The same company has partnered with other Indigenous language speakers and has Maori, Irish, Guaraní, K'ich'e, and Yucatec in different stages of its **Incubator***.[34] This type of partnership has also been used by the commercial language learning app Language Drops, which recruited the help of Ainu professor Jirota Kitahara in the development of the Ainu language course.[35] There are important questions raised about the ownership of the linguistic materials that result from these partnerships between corporations (big and small) and Indigenous language users (some of which will be discussed within the **Protecting** approach). However, it should be noted that as more and more young Indigenous language users become trained in computing programming and engineering, a growing number of initiatives are led and managed by Indigenous graduates. One example is the work that Zapotec digital practitioners of the Escuela del Pingüino Xhidza have done by co-creating computer games with children to teach their language using the platform Scratch. Groups of Indigenous researchers and program developers have come together to form their own companies, like Animiiki in Canada. Animikii is an Indigenous-owned digital agency, working on social innovation through Indigenous technology in four areas: website design, custom software, design and branding, and digital communications.

Escuela del Pingüino Xhidza logo; used with authorization.

It is important to keep in mind, as Joshua Hinson, of the Chickasaw Language Revitalization Program, tells us that: 'An app won't make one a proficient speaker, but it can help in learning the language'[36]. Hinson was part of a project in which members of the Chickasaw Nation partnered with the company Rosetta Stone to develop a tool for language learning[37]. What he says coincides with what many other Indigenous language defenders, promoters and academics keep reminding us: that digital media and technologies by themselves will not create fluent language users (speakers and signers) but their strategic use in the classroom, or in the creation of bridges between different generations of language users will.

[33] Learn the Hawaiian and Navajo Languages on Duolingo.
[34] Cursos de idiomas de Duolingo.
[35] The Ainu Language—A Story of Indigenous Japanese History and Culture.
[36] Can an iPhone App Help Save an Endangered Language?
[37] Chickasaw Language revitalization program.

Inspiring Stories
(Case studies)

1 Youtube Channel 'Wayuunaiki para el Mundo'
Colombia and Venezuela (Bolivarian Republic of)

- **Languages:** Wayuunaiki.
- **Practitioners:** Karmen Ramírez Boscán and Ignacio Manuel Epinayu Pushaina.
- **Sites:** Wayuunaiki para el mundo Youtube and Facebook.

Description: This initiative was created with the goal of supporting the learning and teaching of Wayuunaiki, the language of the Wayuu people, online. Lessons are presented in a series of videos on a YouTube channel. The channel has had an uneven development but stands out for having attracted 3,360 subscribers to date. Its creators use an innovative format: a) videos are based on a conversation between two speakers, one as the apprentice and the other as the instructor, one living in Switzerland and the other in Colombia; and b) they use humor as a vehicle to make the lessons more entertaining. Rather than classroom sessions, the video lessons are personal, approachable, and fun. Their content is entertaining, and interactive. It also reflects the experience of Indigenous people living in the diaspora and wanting to reconnect with the language of their ancestors.

Inputs & resources: The project was developed on a voluntary basis.

Tools used: Mobile phone video recording cameras as well as those of tablets and desktop computers. The video editing tool used initially was iMovie, which is pre-installed on the operating system of Apple computers.

Reception: The success of the YouTube channel was first reflected in its number of shares and subscribers, in addition to its Facebook page likes. In six years, the number of subscribers on YouTube has grown considerably. This growth in numbers happened even though the project had a long hiatus. The project's reception is also demonstrated through the comments, videos, and suggestions from their followers.

To learn more:

- Wayuunaiki para el Mundo.
- Las2orillas' portal article.

Inspiring Stories
(Case studies)

2 Memrise for Ume Sámi and Kristang

Ume Sámi is spoken in Sweden and Kristang in Malaysia and Singapore.

- **Languages:** Ume Sámi and Kristang.
- **Practitioners:** Såhkie Umeå Sami Association and Álgguogåhtie for Sámi, and Kodrah Kristang, the Initiative for the Revitalization of the Kristang Language in Singapore.
- **Sites:** Memrise App Viässuoje mujtuoh - Umesamiska ord och fraser and Kriseh-Kristang.

Description: The local, non-profit organization Såhkie was the initiator of this resource based on the needs and demands of the community. Members of the endangered Ume Sámi language community discovered that they could customize the app Memrise to create their own language course in 2014. They started using video clips to teach correct pronunciation of words, even though Ume Sámi typography had not yet been **standardized***. Their example was later picked up by users of the Pite Sámi variant. The development of the app brought together language speakers that were otherwise scattered across a vast region, but also presented them with the challenge of choosing one form of writing the language, where there is a great variation of alphabets and spellings.

While doing research in 2015, a linguistics major of Kristang heritage at the National University of Singapore brought together a group of friends interested in the language. Kevin Martens Wong tracked down the remaining speakers of Kristang to learn the language from them, and named this initiative as Kodrah Kristang: Awaken, Kristang. In 2016 the group launched the Memrise course Kriseh Kristang (Grow, Kristang) after discovering what they could create through the **spaced repetition*** algorithm, **gamified*** design and **leaderboard functions*** of this free online and mobile vocabulary language learning application.

Images & resources: The Ume Sámi project began on a voluntary basis but has since received support from the Institute for Language and Folk Memories, the Sámi Parliament's Culture Committee, Arjeplog Municipality, Arvidsjaur Municipality, Malå Municipality, Sorsele Municipality, Storuman Municipality and Umeå Municipality. The Kristang project has links with the Kristang Language in Singapore Documentation Project Collaborators, and the Eurasian Association Singapore. They are open to private donations, too.

Tools used: The 'Create Course' function on Memrise.

Reception: According to Coppélie Cocq, from Umeå University: 'The [Ume Sámi] course had a greater impact and spread than [their creators] had hoped for'. Memrise's CEO was very interested in the initiative and traveled to Sweden to meet Sámi community members and provide technical assistance. Furthermore, the Memrise platform hosts a range of Sámi language courses for different varieties, which means that other Sámi speakers have also found the medium attractive.

The Kristang Memrise course is a key component of the services offered by the Kodrah Kristang initiative, which are also offered in-person at a community club in Singapore. The Memrise course is used along with an audio course hosted on Soundcloud and a diagnostic exercise administered at the end of each level. The success of the Kristang Memrise inspired the start of similar projects among speakers of other Indigenous languages, like Unangam Qilinĝingin in Alaska.

To learn more:

- Apps for Endangered Languages.
- Reindeer herders, an app and the fight to save a language.
- Traditional knowledge, new experts.

Inspiring Stories
(Case studies)

3 Vamos a Aprender Mixteco
Mexico and also California, United States

- **Languages:** Tnu'un Davi (Mixtec variant of Santa Inés de Zaragoza)
- **Practitioners:** Donato García and Laboratorio de Ciudadanía Digital-CCEMx.
- **Sites:** Vamos a Aprender Mixteco App.

Description: Vamos a Aprender Mixteco ('Let's Learn Mixtec') is an app based on the teaching method developed by Mixtec speaking teacher Donato García to learn the variety of Mixtec spoken in Santa Inés de Zaragoza, Oaxaca, Mexico. The app was developed through a collaboration between the digital publishing company Manuvo and the Digital Citizen Laboratory (Laboratorio de Ciudadanía Digital), a training programme run by the Spanish Cultural Centre in Mexico (Centro Cultural de España en México). The material is divided into 20 lessons which teach basic vocabulary related to topics such as greetings, numbers, community life, wildlife, and local geography. The vocabulary is mapped on a touchscreen landscape where users can click on the images to see the written terms and hear the tonal pronunciation of Mixtec language. The developers of the application aim to generate interest in the languages, the system of community life and the cosmogony of the Indigenous peoples of Mexico. The app was launched in June 2015.

Inputs & resources: The app development was supported with resources available to the Digital Citizen Laboratory through its partnership with various institutions. Among them are private companies and bank foundations, such as Fundación Telefónica México and 'la Caixa' Foundation, as well as cultural institutions, such as Ateneo Español de México.

Tools used: Specialized software designing tools through the partnership with Manuvo.

Reception: The app was launched in June 2015 through Google Play Store and the App Store. In the first month of its launch, it was downloaded by 20,000 people throughout the world. Unofficial reports stated that the app had been downloaded in different parts of the world (not just in Mexico), and that it was one of the top-ranking educational apps for several weeks. The app was especially well received by Mixtec speakers living in California and other parts of the United States, wanting to share their language heritage with their children. The success of this application motivated the Digital Citizen Laboratory to support the development of two more applications: Vamos a Aprender Nahuatl and Vamos a Aprender Purépecha.

To learn more:

- Vamos a Aprender Mixteco (Let's Learn Mixtec)
- Top 3 Indigenous language learning apps (in Spanish)
- Mexicans Struggle to Preserve Indigenous Language Miles from Home.

Tools & Resources

Key Resources

- Read Robert Elliot's chapter in the book Revitalizing Endangered Languages, 'Technology in Language Revitalization'.
- YouTube Education: What You Should Know About It.
- Building an educational channel on YouTube.
- How to Create a Language Course on Memrise.

Practical resources

- How-to Learn an Endangered Language.
- StoryWeaver Translate is a repository of high quality, openly licensed multilingual storybooks sourced from global publishers, including but not limited to Pratham Books. Every book is freely available in multiple formats and can be read online. Translation and versioning tools help customize the books for **localized*** requirements and these resources become available to other users as well.
- How to Create an Animation using Bitmoji and PowerPoint
  - in English and Here.
  - in Spanish
  - in Portuguese
- How to Make a Stop Motion Video.
- Creation of educational activities with JClic (in Spanish).
- Create stories, games, and animations with Scratch. This platform, supported by the Massachusetts Institute of Technology, is available in dozens of languages, including isiXhosa, Kiswahili, Kichwa, Maori and Rapa Nui.
- Bloom: How to make a Talking Book Video playlist for creation and edition of audiobooks. These could facilitate IL learning and transmission in low-literacy contexts.
- Seven Free Applications to Edit Video (in Spanish). FOSS* video editing tools enable a better IL audio-visual production.
- Learn to Make Stop Motion Videos like a Pro. This is a simple tutorial to create animation videos with a mobile phone and the Life Lapse app. Animations can illustrate IL stories for young children.
- How to Trim Your Videos with the Video Editor in YouTube Studio.

Platforms and apps

These appear on Daigneault's report 'Learn Languages Online: A Guide to Studying Indigenous, Under-Resourced and Minority Languages'.

- Duolingo.
  The platform offers robust and well-conceived curriculums for medium-sized Indigenous languages such as Navajo and Hawaiian as well as minority European languages such as Welsh and Catalan.
- uTalk.
  uTalk is a paid educational platform where users can learn Maori, Samoan, Fijian, Welsh, Sicilian, Scottish Gaelic, Scots, Sardinian, Southern Saami, Manx, Irish, Galician, Catalan, and Basque.
- Master Any Language.
  Users learn through games, flashcards, or more traditional-style courses, with sound on or off. Languages available: Greenlandic, Inuktitut, Inupiaq, Navajo, Ojibwe, Guarani, Quechua, Aymara, Maori, Samoan, Fijian, Tongan, Tahitian, Nauruan, Marshallese, Komi, Cornish, Breton, Corsican and many others.
- Language Drops.
  This is a paid educational platform that is thoroughly built for the mobile user experience. Users can learn Hawaiian, Māori, Samoan and Ainu.
- The Language Conservancy (TLC).
  This organization supports Indigenous language revitalization projects in North America and Australia by creating multimedia tools such as language-learning apps and vocabulary builders that are accessible on iOS as well as Android devices.
- Laboratorio de Ciudadanía Digital – CCEMx
  This project of the Cultural Centre of Spain in Mexico, in collaboration with tech company Manuvo, created Apple and Android language-learning platforms for three Mexican languages: Náhuatl, Mixteco, and Purépecha in 2015-2016.
- Binasii Inc.
  This platform includes digital dictionaries, language-learning tools and word game apps for North American Indigenous languages such as Sioux Valley Dakota, Opaskwayak Cree, Saysi Dene, Long Plain Ojibway and others. The resources are created as partnerships between Binasii and local language authorities and tribal councils.
- IIAP (Instituto de Investigaciones Para la Amazonia Peruana)
  It has produced a wide variety of Google Play educational apps for many Amazonian languages in Peru such as Ashaninka, Tikuna, Taushiro, Bora, Quechua de Lambayeque and others.
- Lingua Libre App (by Wikimedia)
- This is 'a library of audio records that everyone can complete by providing words, proverbs or sentences. Lingua Libre has been designed so that everyone can pass onto future generations the fragile treasure of orality.'
- Educational Resources for Endangered Languages (Australia, Canada, New Zealand, and the U.S.)

Learning tasks and activities

1. Search, compile and **digitize*** educational material in the language. The lack of appropriate educational materials and linguistic sources in Indigenous languages is a serious problem for aspiring defenders and promoters. At the same time, there are dozens or perhaps even hundreds of vocabularies, dictionaries, grammars, manuals and textbooks that go unused in university and/or personal libraries, or already in the hands of a few proactive Indigenous educators. If one is aware of such materials, one can create a collection of digitized copies to circulate online. With the authorization of the individual or collective authors, one can start a blog or social media account to make these materials available to other potential educators, students and practitioners.
2. Create a video channel to teach the language online. More and more language users, including those who are fluent in sign languages, are starting their own video channels on all social video platforms available. It is not difficult to create videos to teach the language but one needs to be more creative than just standing in front of a camera with a blackboard behind. Sound recording is important, and animations can be easily added to make videos more attractive, especially to younger audiences.
3. Translate a storybook to teach the language to children in the community. Children's books are key to developing Indigenous language literacy. Yet, because Indigenous languages often occupy a marginalized status in different countries, Indigenous children do not have access to age-appropriate literature. Grassroots language defenders and promoters can, however, start their own efforts to translate and publish digitally their own versions of classic as well as contemporary books for children.
4. Develop an educational app or video game for the language. There exist resources that render it fairly straightforward to create an online course using some of the functionalities of platforms like Memrise, or Quizlet, among others. Try to create a video game using Scratch, too. This can form the first steps in a process leading towards a larger collaboration with a training school for computer programmers or software designers in the region.

Measuring impact

The effects of educational activities and media are typically very difficult to measure, especially when they take place or are consumed outside of the classroom. However, Indigenous academics Onowa McIvor and Peter Jacobs, working at the University of Victoria in British Columbia, have developed a language learning assessment[38] tool intended for adult learners but that can inspire similar tools to evaluate learning digital tools aimed for different audiences, especially children and young people. This could be adapted to

[38] FirstVoices Language Apps

involve users of apps, games and other digital media used to transmit the language in assessment exercises. One example of how this tool could be adapted is the following:

Help us improve this Indigenous language app by answering the following: As a Beginner Language Learner and user of the app X or follower of the media X, one finds that these have helped one to...

a. Set language learning goals in the language.

b. Start and end a conversation using the right greetings and goodbyes.

c. Use survival phrases (when one do not know the right words).

d. Repeat the words correctly when one hears them from a fluent speaker.

e. Use words and simple phrases to introduce oneself.

f. Use some words or short phrases to share personal information.

g. Ask speakers to repeat themselves when needed.

h. Combine a few words to form different sentences.

i. Use verbs to describe what one is doing.

j. Use verbs to describe what somebody else is doing.

k. Ask simple questions using single words and short sentences.

The specific questions will have, of course, to be related to the content and goals of the app, website, game or video blog that are evaluated. But breaking down the learning steps or components this way could also be beneficial for the elaboration and design phases of the language learning tool.

Module self-assessment

This is the end of the Educating approach module. To have a sense of whether one have completed the learning objectives of this module, please, consider and answer the following questions:

1. Does one understand better now the opportunities that digital technologies can offer for Indigenous, other minority and other lesser-resourced languages education?
2. Can one easily identify now the available media technology resources, collaboration and networking forms that could make digital language education more dynamic and appealing, especially to the younger generation of potential speakers?
3. Does the reader consider the value of entertainment, collaboration and networking in digital education important for the relevant work? Does one know how this can be achieved?
4. Can one identify the potential collaborations and networks that could help one and other language users develop digital tools for the transmission of the language more easily and with good quality?

Key approach 5: Reclaming

indigenous languages and knowledges digitally

This approach consists of either **digitizing*** and distributing previously recorded linguistic and cultural materials, or of documenting contemporary forms of the language. This deliberate path can also be understood as a form of '**digital repatriation***'. It can take the form of **language documentation*** but also it can be about communicating cultural knowledge through digital, multimedia and interactive maps.

Learning objectives

- To investigate the importance and potential uses of digital documentation for language revitalization, beyond what linguists and other researchers do for their own purposes.
- To explore how old materials compiled by researchers and other non-Indigenous people in the past can be digitized and re-circulated to support language and cultural revitalization efforts.
- To discover how Indigenous and other linguistic communities (and their allies) can organize their own **language documentation*** projects and establish their own platforms to support language revitalization efforts.
- To consider ways to integrate the content that multiple Indigenous language users (speakers and signers) are creating and publishing online, in language revitalization efforts.
- To examine the importance of connecting language with practice and of harnessing the multiple media possibilities that digital technologies offer to communicate Indigenous and other linguistic communities' heritage, for example through interactive maps.

Discussing this approach

This approach relates to at least three similar and yet distinctive processes:

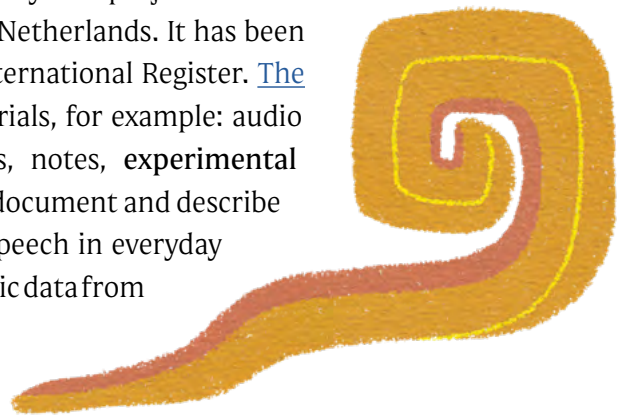
1. What can be characterized as a form of '**digital repatriation***'.
2. The **online curation*** of linguistic and other Indigenous heritage materials.
3. Several efforts to improve the visibility of Indigenous languages and the histories and knowledge they represent through digital mapping.

Language reclamation

Language reclamation* describes the active re-learning of mother or heritage languages. This expression is found mainly in North America, among young Indigenous language defenders and promoters. In this toolkit, however, 'reclaiming' designates initiatives which document, compile, collect, curate, acknowledge and visualize Indigenous languages and forms of knowledge.

Linguists and other socio-cultural researchers have been engaged in the recording and analysis of Indigenous and other under-resourced languages in the context of academic pursuits. This documentation has the potential to contribute to the preservation of these languages, although the link between one and the other is not always evident.

One important example is the Language Archive, created by the Max Planck Institute (MPI) for Psycholinguistics and the Max Planck-Society. The project is hosted physically on a server in the MPI in Nijmegen, the Netherlands. It has been included in the UNESCO Memory of the World International Register. The Language Archive contains diverse linguistic materials, for example: audio and video **language corpus*** data; photographs, notes, **experimental data***, and other relevant information required to document and describe languages and how people use them; records of speech in everyday interactions in families and communities; naturalistic data from adult conversations from endangered and under-studied languages, and linguistic phenomena.



Digital repatriation

Universities and research institutions have created online repositories of linguistic materials where these are catalogued, described, transcribed, and analyzed according to scientific categories and labeling protocols. Among the most significant are the Archive of Indigenous Languages of Latin America, located in the University of Texas in Austin, the United States and the Endangered Language Archive at SOAS University in London. How these rich linguistic databases could be used in language revitalization efforts is, however, not evident.

In response to this challenge a few initiatives have emerged trying to make that connection more explicit. One of the most significant is the Indigenous Languages Digital Archive (ILDA) This is a web-based software designed to compile historical and contemporary linguistic records of endangered languages (mainly from North America) into a digital archiving space in order to support language revitalization through linguistic analysis and development of language learning materials. The primary intended users of this web-based platform are members of Indigenous

peoples in the United States and Canada, since the majority of records that have been integrated into this online space are those stored by the Smithsonian Institution. Member of Indigenous nations receive basic linguistic classification and analysis training from the Miami University of Ohio. This project is a good example of a '**digital repatriation***' of linguistic as well as other cultural heritage materials (photographs, audio recordings, etc.). It puts a strong emphasis on semi-professionalized linguistic description as a building step for the creation of educational materials.

A similar project, which is not exclusively focused on Indigenous language but does involve the documentation of artifacts, like carvings, quilts, among others, is the Plateau Peoples' Portal. The portal offers a gateway to the Plateau peoples of Northwestern, in the United States cultural heritage, including linguistic records and media in the languages of the Spokane Tribe of Indians, the Confederated Tribes of the Colville Reservation, the Confederated Tribes of the Umatilla Indian Reservation, the Coeur d'Alene Tribe of Indians, the Confederated Tribes of Warm Springs, the Confederated Tribes and Bands of the Yakama Nation, the Confederated Salish and Kootenai Tribes of the Flathead Reservation, and the Nez Perce Tribe. The materials in the Portal, many of which have been stored for decades in several state-level and national institutions, have been curated by tribal representatives, and offer added traditional knowledge and cultural narratives to enhance and enrich understanding to many audiences.

A comparable project in South America was funded by Rising Voices in 2014. This was a small undertaking led by two young linguistics students from Colombia, one of whom was from the Indigenous people whose linguistic and cultural materials were **digitized***. The project is called Yadiko Uruki, and it is also one featured as an Inspiring Story (see below).

What all these projects show is the high value of research materials and records collected and stored in museums, libraries and universities for the revitalization efforts of several Indigenous and minority communities. Of the projects reported here, many have emerged from collaborations between those communities and academic and cultural institutions. However, grassroots digital practitioners can start their own self-managed projects of documentation of their own cultural heritage, historical and contemporary, without a complex institutional and costly website, and with a few equipment and training. The Indigitization Program, a collaborative initiative between First Nations groups and academic partners from the University of British Columbia and the University of Northern British Columbia, provides resources

through the Indigitization toolkit, enables community-led **digitization*** projects through training workshops, identifies funding opportunities, and practitioners for ongoing funding directly to Indigenous partners for sustained cultural heritage management. In addition, the program seeks to grow and work with a network of practitioners around the globe to develop effective practices for the management of digital heritage by individual communities. Their toolkit can be found among the resources for this module.

Another project of interest is the Endangered Languages Project website. Not only does this website offer relevant information and resources to language defenders and promoters but it also allows them to submit their own material or samples in the form of text, audio or video files. In addition, users will be able to share best practices and case studies through a knowledge sharing section and through joining relevant Google Groups. The project is administered by the First Peoples' Cultural Council and the Endangered Languages Catalogue/Endangered Languages Project (ELCat/ELP) team at University of Hawai'i in Mānoa. The First People's Cultural Council is also involved in the development of the platform FirstVoices, also included as an Inspiring Story (see below).

Other similar projects are the Wikitongues platform and the Miromaa database. Wikitongues is building a seed bank of linguistic diversity by **crowd-sourcing*** video oral histories, audio files, and lexicon documents. Miromaa is a simple software platform designed to empower any Indigenous individual or group to oversee the reclamation and sharing of their own traditional language and culture. Miromaa is a language software created by Indigenous people for Indigenous people. In Awabakal language 'Miromaa' means 'saved'. This user-friendly and secure database is designed to help gather, organize, analyze and produce outcomes for language work, even multiple languages or dialects – with an option to create a data file per language or have all data combined.

Wikitongues Logo. Licensed under CC BY-SA 4.0 DEED

There are other interesting, simpler ways of creating repositories of Indigenous and under-resourced languages online. Networks of promoters and academics concerned with the preservation of the Mixtec language in Mexico, for example, have employed a free website builder, Wix.com, to index Mixtec-related media that speakers of this language have published on the internet in the portal Ndatiaku Tu'un Savi. What they have created is in fact a '**mashup***' of information from different sources, including YouTube, Instagram, LinkedIn, and Google, among other commercial platforms. There have also been other initiatives that have reclaimed the historical recordings made by linguists in the recent past, like the project Yadiko Urukɨ, discussed below in *Inspiring Stories.*

Digital mapping

Another interesting way of reclaiming and visualizing Indigenous languages and knowledge is through digital maps. In recent decades, there has been a rapid growth of initiatives to create Indigenous digital maps for various purposes. In North America, Asia and the Pacific, Indigenous geographers and digital practitioners get together every year to exchange their projects, share their experience and discuss common challenges, as can be seen for example on the website of the Indigenous Mapping Collective.

Maps can be used to provide a visual representation of Indigenous languages, histories and knowledge within a landscape. Digital maps offer the advantage of being interactive and **multimodal***, which means that they can host geographical, environmental, and other information, as well as audio files, photographs, and videos that allow the map user to 'listen to Indigenous voices in the land'. An interesting example of this is the Fifty Words project, an interactive online map giving everyone the opportunity to hear Australian Aboriginal languages spoken all across the continent.

Similarly in Canada, we find the Nunaliit Atlas Framework, an **open-source*** framework for the creation of interactive mapping websites. This system was designed at Carleton University in Ottawa to make it comparatively simple to produce data-driven digital cartographies. It allows users to annotate documents and geometries, to integrate multimedia (like photos, videos and audio clips), as well as to edit information offline on a tablet and to sync the map later. The system code has been released under a free software license known as New BSD and can be downloaded on GitHub. Nunaliit has been used to create Indigenous knowledge and language atlases, including the Atlas of the Languages of Iran. Another example of its use for language documentation is the Kitikmeot Spoken Map, where one can explore 1,300 traditional locations, hear the pronunciation of their names, and watch video stories about the cultural significance of different places in this region of Nunavut. The site also contains maps on PDF files that can be downloaded and printed. Many other Nunaliit based maps are listed here. A similar resource, created by a not-for-profit organization based in London, is the platform Language Landscape, which allows people to add audio, video and image related to languages to a world map.

Technology companies like Google, Esri and MapBox also offer non-profit organizations and Indigenous communities the possibility of using their platforms to create Indigenous language and cultural maps. The Tools and resources section of this module lists a few guides to take advantage of these resources, such as Google Earth, or ArcGIS StoryMaps.

Researchers and grassroots practitioners are increasingly collaborating in the creation of repositories, online archives and digital maps that render Indigenous and other under-resourced linguistic heritage and living traditions better documented and more accessible. This key approach has the potential of bolstering many other language revitalization actions.

Inspiring Stories
(Case studies)

1 Yadiko Urukɨ: Jitómagaro Uai (The Sons of Yadiko: the Jitómagaro Clan)
Colombia

- **Languages:** Mɨnɨka Uitoto (or Minica Huitoto).
- **Practitioners:** Ever Kuiru Naforo and Laura Areiza Serna.
- **Sites:** Yadiko Urukɨ: Jitómagaro uai, Yadiko Jitómagaro Facebook, noinui jitoma Flickr and Yadiko jitomagaro Soundcloud.

Description: This is an internet platform created to host digitized songs, dances and ceremonies of the Minika Witoto speakers of Puerto Milán, La Chorrera, in the Colombian Amazon. The project emerged from a collaboration between Ever Kuiru Naforo, a Mɨnɨka Uitoto speaker, and Laura Areiza Serna. They began working on this website in 2014, when they were both studying at the University of Antioquia in Medellin. The focus was on the **digitization*** of audio recordings and photographs made in the late 1980s by external researchers. These were songs, stories and dances that Ever's father, Aurelio Kuiru, was responsible for transmitting. The welcome page states that:

> *'The words of my grandfather and my father were recorded by the 'White Man' 30 years ago. These are kept in cassettes and stored documents that speak about Yadiko's dance. But these recordings of our grandparents and uncles are not available to those of us who today seek to remember and learn'.*

The website Yadiko Urukɨ '**mashes up***' and presents the digitization of audio recordings (hosted on Soundcloud) along with photographs (from Flickr), videos (from YouTube), transcriptions, and a few explanations. The information is shared with the wider public, but it has also been returned to the community.

Inputs & resources: The project received funding from the Rising Voices Amazonia grant program in 2014. This program was sponsored by Avina Américas, Fundación Avina, and the Fundación Skoll.

Tools used: WordPress.com, Soundcloud, Flickr, and YouTube.

Reception: The greatest online impact of this project was among researchers and other non-Indigenous people interested in the Mɨnɨka Uitoto language and culture. The **digitization*** of this heritage did,

however, have also an important effect in the community of Puerto Milan. The on-site sharing of digitized materials with members of the community led to a revitalization of songs, dances and ceremonies. The return of this information was, however, challenging because there was no electricity or internet connectivity when the website was launched.

To learn more:

- Yadiko Urukṯ.
- Mai ro: Cantar la canción de yadiko (in Spanish: Mai ro - Singing yadiko's song)
- Yadiko Urukṯ – Children of Tobacco, Coca and Sweet Cassava.

Inspiring Stories
(Case studies)

2 YorubaName.com

Nigeria, Benin, Togo, Cote d'Ivoire, Sierra Leone and The Gambia. Spoken also by migrant communities in the United Kingdom and the United States.

- **Languages:** Yoruba.
- **Practitioners:** Kọlá Túbọ́sún, Dadépọ Adérẹ mí, and Laila Le Guen.
- **Sites:** YorubaName.com, Yoruba Names facebook, twitter and instagram.

Description: YorubaName.com is an online intervention to preserve and document all Yorùbá names in a multimedia format. It is part of a long-term project to document different African cultural experiences on the internet as a way of ensuring the survival of African identities in their various expressions.' It was initiated by Kọlá Túbọ́sún as a multimedia dictionary in 2005. After a successful fundraising campaign, the names database was launched as a **crowd-sourced*** platform in 2015. The system has gathered more than 6,900 names, which are searchable and presented in Yorùbá **diacritical writing*** and an audio file both of which mark the correct tonal pronunciation. The entry contains the main and extended meanings of the name, morphology, gloss, and geolocation. It also includes references to famous personalities with the name and its variants. The dictionary returns a result even if the name has not been written using the tone-marking spelling. The project hopes to be able to include other cultural information associated with the names, like local history.

Inputs & resources: The project was originally funded through a **crowd-funding*** campaign via IndieGoGo. The campaign website used a clip from a popular talk show where a British-Nigerian actor explained the complexities of Yorùbá names and their pronunciation. The running of the site relies on the work of volunteers for lexicographic analysis, social media dissemination, and software development. It also has the support of Orature Lab, Capital & Square, and the African Languages Technology initiative.

Tools used: Volunteers have produced a customized codebase for the management of the site that has been published on GitHub, as well as keyboard layout for Windows and Mac. After raising funds through IndieGoGo, the project was able to implement their own **Text-To-Speech (TTS)*** application for Yoruba.

Reception: The project has received important endorsements (for example, from Nobel Prize winner Wole Soyinka) and enjoys the constant support of volunteers. This has enabled the idea to grow and branch out toward other projects, like the Yorùbá Melody Audio Course.

To learn more:

- Online Dictionary Helps Nigerians Decode Their Names.
- Four years at YorubaName.com: Sixteen Milestones.
- The YorubaName Project.

Inspiring Stories
(Case studies)

3 FirstVoices
Canada, United States and Australia.

- **Languages:** 33 out of 34 British Columbia-based Indigenous languages are represented on FirstVoices. It includes languages from other places as well (see below).
- **Practitioners:** First Peoples' Cultural Council.
- **Sites:** FirstVoices.com.

Description: This is an online space for communities to share and promote their language, oral culture and linguistic history. Communities create secure, interactive language sites online by uploading audio recordings, words, phrases, songs and stories to be shared with others. Operating since 2003, FirstVoices is an initiative of the First Peoples' Cultural Council (FPCC). It has over 75 language sites, many of which are accessible for public learning. While most language sites on FirstVoices are visible to the public, members can choose to create content that can be accessed only through a secure login. Examples of this type of content include stories, sacred songs, prayers, ceremonial regalia, or dances seen only in community ceremonies.

The idea for FirstVoices originated in the tÁU, WELNEW TRIBAL SCHOOL on WSÁNEĆ territory around 1999, when two teachers Peter Brand and J, SINTEN (Dr. John Elliott) were looking into ways to digitize and revitalize the SENĆOŦEN language online.

The target audience for FirstVoices are Indigenous communities who want to share, promote and learn their languages. FirstVoices is also a resource for non-Indigenous people who are interested in learning more about the languages. Content uploaded to FirstVoices is available to learners no matter where they live, which is especially important considering that over three-quarters of First Nations, Métis and Inuit people in B.C. live off-reserve and are not as likely to have access to language and cultural programming as those on reserve.

Inputs & resources: Funds for the platform are provided by the First Peoples' Cultural Foundation, a registered charity that works in tandem with the FPCC. FirstVoices has partnered with Keyman and Mother Tongues for technological assistance.

Tools used: FirstVoices combines different **open-source*** technologies. Their code is also available online on Github. The keyboards use Keyman technology (see Facilitating approach), and the apps rely on tools developed by Mother Tongues. FPCC maintains full control of FirstVoices servers and acknowledges that ownership of the data remains with the community.

Reception: FirstVoices' own statistics show that it attracts more than 200,000 visits every year and close to 500,000 page views. Apps and keyboards have been installed on more than 2,000 devices. The platform is used by Indigenous communities, language learners, educators, and the general public. Around 15% of users are under the age of twenty-five. Of registered users, 42% say that they use the platform to reclaim their own language.

To learn more:

- FirstVoices FactSheet.
- Splatsin (Eastern dialect) Home Page.
- Kwak̓wala Home Page.

Inspiring Stories
(Case studies)

4 First Languages Map
Australia

- **Languages:** 705 Indigenous language varieties of Australia
- **Practitioners:** First Languages Australia.
- **Sites:** Gambay Place names and First Languages Australia.

Description: First Languages Australia works with regional language centres nationally to develop a map of Aboriginal and Torres Strait Islander languages that reflects the names and groupings preferred by the community. Teachers' notes have been compiled to assist teaching about Australia's first languages across the curriculum. Language centres have provided maps for their regions to be collated into this interactive map of languages and language families. Some regions have chosen to group related languages in colour to help with the sharing of language resources.

Gambay means 'together' in the Butchulla language of the Hervey Bay region in Queensland. It has been designed and produced in a way that allows language centres and communities to update information as they require. People can share video stories about their languages by submitting YouTube or Vimeo links.

Inputs & resources: The project has been supported by the Australian Government's Indigenous Languages and Arts program. They have partnered with the Queensland Indigenous Languages Advisory Committee, the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and with the company Mapbox to develop the map.

Tools used: The digital map is based on a mapping software first developed by the Queensland Indigenous Languages Advisory Committee. It later began using the functionalities offered by the platform Mapbox.

Reception: The project has the support of several language centres across Australia. The Teachers Notes component of the digital map encourages educators to work alongside Indigenous families, groups and communities within school contexts. It offers suggestions about how to use the documentation of Indigenous place names to teach subjects like English, Mathematics, Science, History, Geography, Economics and Civics. It also lists several policy resources to develop language curriculum in schools. All this facilitates wider reception of this digital project.

To learn more:

- Gambay: Australian First Languages Map.
- This Place - Australian Broadcasting Corporation.
- The Marrin Gamu song.
- Language Legends Help Create a Colorful Snapshot of Australia's Linguistic Diversity.

Tools & Resources

Key Resources

- The Language Sustainability Toolkit
  Published by the Living Tongues Institute for Endangered Languages, Wikitongues. The toolkit can be downloaded as a PDF. It suggests strategies for digital documentation and online promotion of Indigenous languages.
- FirstVoices Knowledge Base
  This resource contains information about how to use FirstVoices and tips for working on a language team.
- Openspeaks Multimedia Toolkit
  Produced by the O [Openness] Foundation of India. OpenSpeaks is a lab that has learning resources for the digital documentation of languages. These resources are divided into four interrelated chapters:
  a) Consent, Copyright and Open Licensing
  b) Multimedia (audio-visual) recording
  c) Metadata collection and publication, and
  d) Accessibility*.
- Keeping it real: Video data in language documentation and language archiving
  Working with video data is on its way to becoming standard practice in language documentation. However, documenters looking on the web for guidance on standards and best practices for archiving audio-visual data encounter a vast and potentially confusing diversity of information. Unfortunately, a lot of information on archiving video is concerned with digitized film stock and not with the type of video data produced in language documentation. This paper presents relevant standards and established community best practices in a short and realistic manner, pledging to keep things real.
- Indigitization Toolkit
  The Indigitization Toolkit is a collection of resources to support and guide digitization projects in Indigenous communities. The Indigitization Toolkit also fits into the broader goal of providing support to First Nations communities in the management of their information.
- *Guide to linguistic revitalization: for a practical and informed management* (in Spanish, 2020).
  Published by LinguaPax International, and Universidad Autónoma Benito Juárez de Oaxaca in Mexico, this guide is the updated version of a book first published in 2012 with a global perspective, informed by academia but also by grassroots' experiences. It touches a wide range of topics on Language Revitalization Strategies, Language Vitality, and Practical Revitalization Activities.

- Digital Language Diversity Project
  Produced by the Digital Language Diversity Project, this resource focuses on language documentation, the use of Wikipedia, and social media for revitalization.
- Mapbox: Mapping with OpenStreetMap
  OpenStreetMap is a free and editable map of the world, created and maintained by a large international community. Mapbox Streets, a customizable map layer of streets, buildings, and places from all around the world, is powered by open data from OpenStreetMap. Anybody can create an account and start editing on OpenStreetMap.org within minutes. This site has versions in Spanish and Chinese.
- Indigenous mapping with Google Tools
  Published by the Indigenous Mapping Network. This video introduces ideas and practical steps to create maps reflecting Indigenous languages and knowledge using free Google Maps tools.
- Share community knowledge with Story Maps.
  This is a step-by-step manual to use ArcGIS StoryMaps to create interactive maps with Indigenous knowledge, histories and languages.
- World Atlas of Languages
  UNESCO is elaborating the World Atlas of Languages to celebrate and protect linguistic diversity in the framework of the upcoming International Decade of Indigenous Languages 2022-2032. The Atlas will present basic data on over 8,000 languages spoken and signed in the world (both in use and not), as well as more detailed data documenting how many of these are used in various domains at the national level.

Practical resources

- First Voices' Guides and Resources**.** These resources have been indexed with the explicit purpose of being used to document and revitalize Indigenous languages.
- What is a Web Mashup*?
- How to create a website with Wix.com
- How to create a website with WordPress
- DIY Toolkit: Fundamentals of field recording. These technical recommendations to record audio interviews in the field could prove important for language documentation as well. They were produced by YR Media, a network of young journalists and artists, based in Oakland, USA.
- The Master Elicitation* List – Living Tongues
  Citizen linguists and community language promoters undertaking documentation projects often ask: what words and phrases should we document in endangered languages? Is there a list available to use as prompts? In an effort to help language promoters, Living Tongues has made their Master Elicitation List available for public use by anyone who needs it.
- Nunaliit Tutorial Wiki is designed for a Linux operating system and uses a number of open-source software packages. However, this tutorial recognizes that most users are coming from a Windows operating system background and are not accustomed to working with Linux.
- Activists' Guide to Archiving Video. It contains guidelines to organize a video archive that can prove useful for digital engagement with Indigenous languages. The Guide was produced by the human rights organization Witness.

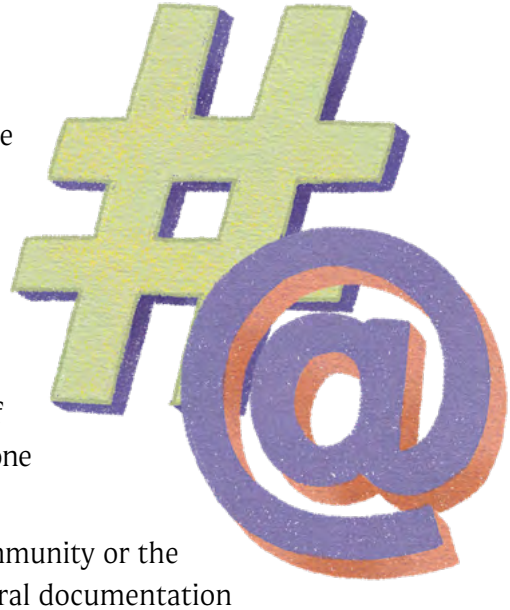
Learning tasks and activities

1. Research the current online institutional archives that contain linguistic materials mentioned at the beginning of this module (MPI's Language Archive, University of Texas' Archive of Indigenous Languages of Latin America, or SOAS' Endangered Language Archive). Examine those databases and consider the following questions: How can one use those resources for language revitalization? Are they easy to turn into revitalization materials? Can one write to the managers of the online archives to let them know what one thinks of the platform?
2. Make a collective plan to document the language. What does one's community or organization think is important to document? How can this be used to teach the language? One can then use this plan to set up a platform using FirstVoices platform. Check 'Using FirstVoices' for more ideas about how to do this.
3. Create a website to compile publicly available media made by Indigenous language users. Do a quick search through different platforms to see who is publishing content in the language (see, for instance, tweets in Indigenous languages which was discussed in relation to the Multiplying approach). These materials could be popular digital content, tweets, videos, songs, audio recordings, blog posts, photographs, or any other type of media that have been made publicly available in the language. Make a website using Wix, WordPress or Blogspot and use it to promote the language, to set up educational activities with community members or to create links with members of the diaspora. Doing it through a Facebook Fan page, Instagram handle, TikTok account or other similar social media channel could also make the documentation and reclaiming process more interactive. Be sure in all cases to contact and give credit to the creators of these materials. This could also result in the creation of a wider community of Indigenous language content creators.
4. Develop collaborations between language users (speakers and signers) and researchers and explore the use of previously made recordings for revitalization activities. Is one close to a university or research centre with a linguistics department? Does one know if they have a repository of language materials? Talk to the public outreach department to find out if they would like to establish a collaboration with the relevant organization or community. Think carefully about what one wants to ask researchers to do for the community and set clear goals with them to revitalize the language and protect the community's cultural knowledge (more about this in the Protecting key approach).
5. Create a digital map with the community to illustrate stories in relation to the landscape. What are the stories that live in place names? Can one ask members of the community to tell these stories and then put them in a digital map? What other stories can be told with the map itself?

Measuring impact

Suggested aspects to consider when measuring the impact of activities within this key approach are the following:

- **Usability of archives and repositories.** Are they easy to access and understand by community practitioners and non-experts?
- **Appropriation by language users (speakers and signers).** Several online platforms are designed in theory to support revitalization efforts, how often and how much are they being visited, consulted, quoted or 'recycled' by communities and organizations?
- **Identification by language users (speakers and signers).** Do speakers know about the platform, archive, or map that has been created to document and share their language? What else can be done for people to know the online space better?
- These are general suggestions as some projects may have more specific goals or objectives in mind, for instance, Indigenous digital mapping to protect the territory against extractive industries.



Module self-assessment

This is the end of the Reclaiming approach module. To have a sense of whether one has completed the learning objectives of this module, please, consider and answer the following questions:

1. Has it been made clear what digital language documentation consists of and how this could help bolster revitalization efforts?
2. Does the reader understand what 'digital repatriation' of linguistic and other cultural materials consists of and how one can prepare a project with these characteristics in mind?
3. Is it clear which basic digital tools and resources the community or the organization need to start their own language and cultural documentation and **digitization*** project?
4. Does a better picture exist of the type of media that one can access, collect and compile in a website, platform or archive to promote the language?
5. Is there better knowledge of the possibilities offered by digital mapping to support, visualize and promote the language and cultural knowledge through partnerships with other actors, particularly Indigenous peoples?

Key approach 6: Imagining

and creating new digital media in indigenous languages

This key approach seeks to break new ground through the creative use of digital technologies in artistic expression. It includes practical as well as experimental technologies in both the creation and the circulation of songs, films, comics and other media.

Learning objectives

- To explore the role that artistic creation and expression can play in the promotion, preservation and dynamization of Indigenous language, with particular consideration to the injustices to which they have been historically subjected.
- To identify new fields of digital activity and expression through which language revitalization projects could be implemented.
- To become familiar with the digital resources and tools that allow people to create new media and content in Indigenous, minority or under-sources languages.
- To understand the importance of innovation and experimentation with new formats for the expression of Indigenous languages.

Discussing this approach

Language defenders and promoters in different parts of the world have started to reclaim previously neglected or marginalized linguistic art forms. They have also adapted or re-adopted traditional forms of art, like chants, storytelling or dance, and have re-imagined these creative traditions to promote the language among younger audiences. In this work, they have also been using digital technologies and social media to reach new audiences and increase the presence of their linguistic and cultural identities in the national and global scenes. They experiment with new forms of literature (including comic books), **performance*** and poetry, song composition and music, and other cultural activities like radio production, TV series dubbing, multimedia installations and advertising. These art forms are used as strategic ways to revitalize their **minoritized languages***.

New artistic forms

Among these new forms of artistic creation, song composition and musical innovation stand out. The relation between music and language has occupied a central place in revitalization efforts, for example, for the Catalonian or Maori languages. In Latin America, an interesting case of Indigenous language innovation took place in Peru in 2015 when a teenager, Renata Flores Rivera, became a social media sensation for interpreting Michael Jackson's 'The Way, You Make Me Feel' in the Quechua language. Her YouTube music video has gathered more than 1.7 million views to date. An opposite but equally interesting process happened when the Comcaac or Seri rock band Hamac Caziim (Sacred Fire) started recording old traditional songs from their people using heavy metal versions – after having obtained authorization from their tribal government in northern Mexico.

"MX MM Dia Internacional De La Lengua Materna" by Secretaría de Cultura CDMX is licensed under CC BY-SA 2.0.

Audio-visual media has become the predominant form through which cultural and linguistic contents circulate nowadays. The number of video productions in lesser-used languages is, however, still insignificant in comparison with the number of movies and programmes released in languages like English, Hindi, Chinese, Arabic, or Japanese. Although they might not reach millions of cinemagoers, films in Indigenous languages can still have an important cultural impact. This was the case of the film *Atanarjuat: The Fast Runner* directed by Inuit filmmaker Zacharias Kunuk in 2002, which was later selected as one of the most influential Canadian films of all times.

Examples

Social media platforms like Soundcloud, Facebook, Spotify, YouTube, and Vimeo could help increase the audiences for Indigenous language songs, films, animations, and comic books. But there are also interesting projects and platforms devoted to showcase and share these new Indigenous language contents. For example, Isuma.TV, which is a collaborative multimedia platform for Indigenous filmmakers and media organizations.

Indigenous media organizations can operate their own state-of-the-art media site, under their own design and URL, and at the same time share Isuma.TV's **back-end infrastructure***. The collective platform currently carries over 6000 videos, and thousands of other images and audio files, in more than 80 different languages, on 800+ user-controlled channels, representing cultures and media organizations from Canada, U.S.A., Denmark, Norway, Sweden, the Russian Federation, Australia, New Zealand and all over Latin America.

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Another interesting platform is the 'Mediatecatl' of the Mexican portal Tlacuatzin. This site offers multilingual, **multimodal*** and multipurpose, playful and didactic materials produced in collaboration with Indigenous language speakers by the Digital Archive of Indigenous Languages project located at *Centro de Investigaciones y Estudios Superiores en Antropología Social* (CIESAS) Mexico for more than two decades. These materials celebrate oral, ancestral knowledge, but also the contemporary visual and literary arts of Indigenous authors, through new formats and technologies (including children's books). The Mediatecatl contains audio, image, audio-visual and multimedia collections for open consultation online. This includes innovative musical content from Indigenous creators; educational materials in Indigenous languages; and recordings of festivals, talks and conferences focused on art and language revitalization. The Mediatecatl is also open to community submissions of artistic work in Indigenous languages.

Indigenous innovative art projects need to manifest a strong commitment to the language and culture, long-term grassroots collaboration and engagement, reflexive and extensive research, social inventiveness, technological curiosity and creativity, cultural audacity and experimentation in close dialogue with the keepers of tradition (so as to prevent community divisions), and strategic alliances with a wide range of stakeholders, including governments and cultural industries, to highlight but a few key elements.

Inspiring Stories
(Case studies)

1 ADN Maya – Hip-Hop in yucatec maya
Mexico, Belize and the United States

- **Languages:** Maayat'aan (Yucatec Maya).
- **Practitioners:** Jesús Pat Chablé and member of the Maya DNA collective.
- **Sites:** ADN Maya Films Youtube, Facebook, Instagram and Spotify.

Description: A growing number of young Yucatec Maya hip-hop artists have effectively used online platforms to publicize their work. Around 2006, several groups and individuals began to produce their own songs and albums in makeshift, rudimentary studios constructed in private houses in cities like Carrillo Puerto, Tulum, and Playa del Carmen, in the state of Quintana Roo, Mexico. Their work circulated mainly online, through platforms, like SoundCloud, Reverbnation, YouTube, Facebook and more recently Spotify. Jesús Cristóbal Pat Chablé, 'Pat Boy', became renowned among these Maya rappers. He and his partner Tania Jiménez Balam created 'ADN Maya Producciones' (Maya DNA Productions) in the mid-2010s with the goal of 'encourag[ing] young Maya speaking artists, by promoting spaces for the visibilization of the contemporary Maya music movement. Also, to contribute to language revitalization and community strengthening [...]'. The Maya DNA initiative has established alliances with different institutions and supported the work of more than a dozen young Maya musicians, like Dino Chan, Yaalen K'uj, La Primicia 983, Los Hermanos Po'ot, Pixan Eek', Sloyder MC, AP-C El Aldeano, Xi'imbal Bej, Tejero Rappers, Báalam Ich, Paalil K'iin, and others.

Inputs & resources: The Maya DNA initiative operates mostly on a voluntary basis, but it has also received support from cultural agencies of the Mexican federal government, such as the General Directorate of Indigenous and Popular Cultures, the National Institute of Indigenous Languages and the National Institute of Indigenous Peoples, and state level Ministries of Culture. It has also collaborated with research centres like the Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS) (see Mediatecatl), NGOs, and local groups. These associations have provided financial resources for audio-visual production and audio recording, including the production of high-quality CDs.

Tools used: Most of Maya DNA's audio-visual production is hosted on YouTube. They have also published their songs on platforms like SoundCloud, and Reverbnation, and more recently have begun disseminating their work on Spotify.

Reception: A few of their musical videos have gone 'viral', for example 'Estoy Contento' (I'm happy) by Tihorappers recorded more than 2 million views in one month in 2016. Maya rap songs are popular among cultural radio programmes and stations, but they are not programmed by commercial stations yet.

To learn more:

- Jesús Pat Chablé's profile on Wikipedia.
- Meet Mexico's Mayan Hip-Hop Artists.
- Rapear en maya para reivindicar el orgullo de la lengua (Rap in Maya to revive the pride of the Language)
- Pat Boy, el rapero que canta en maya para reivindicar a su pueblo en México (Pat Boy, the rapper who sings in Mayan in Mexico)
- Meet Balam Ajpu, a Mayan Hip-Hop Trio That Proves Indigenous Art Transcends Folklore.

Inspiring Stories
(Case studies)

2 Luh Ayu Manik Mas, a balinese language superhero comic
Indonesia

- **Languages:** Balinese.
- **Practitioners:** BASAbali Wiki.
- **Sites:** BASAbali Indonesian Superhero Luh Ayu, Luh Ayu Manik Mas Facebook and Instagram.

Description: Modeled after traditional Indonesian shadow puppet storytellers and co-developed with the community and a team of local artists, the BASAbali Wiki organization has developed a digital comic series focused on a schoolgirl/superhero who touches several environmental and social issues. The comics are co-developed with the community and a team of local artists. Print and digital superhero Luh Ayu Manik Mas engages the Balinese youth to advance the Sustainable Development Goals. Her adventures are **crowd-sourced*** through social media such as Facebook, Instagram and Twitter. This means internet users, especially students, can propose themes and stories that can be incorporated into the cartoon by writers and artists working for the Luh Ayu Manik Mas project. These comic books have been published in three different languages (Balinese, Indonesian, and English). Apart from the comic books, BASAbali has also produced short animation videos with songs in Balinese, see the following example with Bahasa and English subtitles: Luh Ayu Manik Mas Nglawan Luu Plastik.

Inputs & resources: BASAbali is a collaboration of linguists, anthropologists, students, and laypeople, from within and outside of Bali. They rely on the support of private donors and institutional sponsorship of, among many others, the University of Sydney, Google, Meedan, the ARMA Museum and Resort, the Tri Hita Karana Forum, The Asia Foundation, and National Geographic.

Logo of BASABali Wiki and online dictionary is licensed under CC BY4.0.

Tools used: BASABali uses the Asia Foundation's platform 'Let's Read' to distribute digital copies of the comic books. Children and their parents can read the comic books online or download them in PDF or ePUB formats. BASAbali has also created a Wiki Dictionary platform where they have embedded video readings of the book, hosted on YouTube, along with the Balinese, Bahasa Indonesian and English transcriptions.

Reception: The project has been welcomed by the Balinese community, and BASAbali Wiki reports that 'Luh Ayu Manik Mas' is now being incorporated into the classroom. In an interview with Rising Voices (see link below), they said that: 'Her books have already been used to teach Balinese teachers about creative writing and other skills. We will continue to reach out to the public through on-the-ground workshops and in social media to elevate the value of local languages.'

To learn more:

- Indonesian superhero cartoon fights for the environment and the Balinese language.
- BASAbali Wiki Luncurkan Buku Kisah Kepahlawanan Perempuan Bali Berjudul Monster Virus Menyerang Desa.
- Marvels with Purpose: A Balinese Superhero Powered by Community.

Inspiring Stories
(Case studies)

3 Singuistics, an app to learn Inuit and first nations songs
Canada

- **Languages:** Inuktitut, Gwich'in, Anishinaabemowin,
- Cree, and Dene languages.
- **Practitioners:** Pinnguaq.

  Sites: Singuistics App.

Description: Singuistics is an app released by Pinnguaq in 2013 to learn traditional and original songs in a fun, three-step programme alongside illustrations created by Indigenous artists. It was first intended to expose the public to the Inuktitut language through the traditional songs and art of the Inuit people. It is an app that tries to 'embed culture and language in one's head through music'. Commissioned artists interpret songs visually and the user becomes absorbed in the culture. App users can touch words at any point on their tablets and have language lessons out of those. In Singuistics, one can first choose a song, then practice its pronunciation and record the interpretation to the music in the app – like karaoke. Ryan Oliver, of Pinnguaq, said about the programme: 'One of the main things when you're learning a language is to actually speak it. So beyond just playing the song and studying the language lessons, the other two modes are practice and perform'. After recording the version of the songs, one can post them on Twitter, Facebook or e-mail it. 'Pinnguaq' (Inuktitut for 'Play') is a non-profit organization located in Pangnirtung, Nunavut, which aims to provide Nunavummiut youth access to technology through games.

Inputs & resources: In 2014 and 2015, Pinnguaq received funding from the Canadian government to expand the number of languages available in the app. These funds came from the Aboriginal Languages Initiative and the Department of Canadian Heritage.

Tools used: The app has been designed by Pinnguaq, which specializes in projects such as original games and apps, live streaming and video production, and **localized*** translations. The company also works on advocacy, and education and employs, and mentors Indigenous programmers.

Reception: The continuous support (including financial support) that the development of the app has enjoyed is a good indication of its impact. Pinnguaq reports that the app has been downloaded not only in the North, but in Southern Canada, Germany, France and Australia as well.

To learn more:

- Inuit language music app: 'A more natural way to learn'.
- App uses Gwich'in elder's recordings to teach language.
- Honour Water app.
- Musician teaches Inuktitut over TikTok to 22,000 followers.

Inspiring Stories
(Case studies)

4 Conetamalli - Crowd-sourced translation of a comic book

Mexico, Bolivia (Plurinational State of), Ecuador, Peru, Guatemala, El Salvador, among others.

- **Languages:** Nahuatl, and Mixe, Bolivian Qhichwa, Ecuadorian Kichwa, Peruvian Quechua, Maya Popti', Nahuat, Mixteco, Maya Q'eqchi', Maya K'iche', Púrhepecha, Maya Poqomchi', Zapoteco, Hñahñú, among many other languages.
- **Practitioners:** Isela Xospa and Indigenous collaborators from the South American Meeting of Digital Activists.
- **Site:** Xospatronik.

Description: Nahua visual artist Isela Xospa created a short comic book called *Conetamalli*, or *Baby Tamale*, based on stories related to the traditional cuisine of her people. The goal was to use this book to promote literacy in Nahuatl among young children. During the South American Meeting of Digital Activists in Antigua Guatemala, Isela put forward the idea of working on a **crowd-sourced*** translation of the comic with language defenders and promoters from different countries. Many agreed to collaborate in the translation and publication of the comic book in their own languages. Each version of the book can be read online and can be downloaded to print on a double letter front and back from Isela's website, Xospatronik. There are versions of *Baby Tamale* in different variants of Nahuatl, and many other languages.

Inputs & resources: The original comic book was written by Isela Xospa, and designed in collaboration with Dulce Lugo, Artemio Solís, Karla Cano, and Emily Cantrell. She received a small subsidy from the Government of Mexico City for part of this process. They have released their copyrights so that Indigenous language speakers can produce their own translations. All she asks is that people do not modify the story and that they credit those who have worked on previous versions. Its use for profit is also prohibited as the illustrations are protected by copyright law. All translations have been done on a voluntary basis.

Tools used: Isela uses a downloadable PDF with blank spaces that Indigenous collaborators can fill with their own language text. They can re-share with others what they have produced in their own social media accounts.

Reception: The number of language versions is indicative of the success of the initiative. Baby Tamale also has a quality printed version that Isela promotes in book fairs and cultural events. They also have a soft cloth toy based on the story for sale.

To learn more:

- Interview with Isela Xospa, Náhuatl language digital activist.
- Conetamalli, el bebé tamal que busca visibilizar tradiciones de pueblos originarios
- "Conetamalli, the baby tamale who seeks the visibilization of Indigenous Peoples' traditions"
- Conetamalli. Bebé tamal. Baby tamale: un libro-puente entre lenguas y culturas : a book-bridge between languages and cultures
- ¿Qué es la edición comunitaria? La propuesta de XospaTronik "What is community edition? XospaTronik's proposal."

Tools & Resources

Key Resources

- FutureLearn – Get into Filmmaking
  Explore a range of filmmaking specialisms – from screenwriting to production to visual effects – with these free online courses. Learn with award-winning filmmakers, specialist organizations and leading universities.
- Indiewire – Directing your First Feature Film
- WikiHow – How to Make a Music Video
- 7 Creative Ways To Shoot A Music Video By Yourself
- WikiHow – How to Write a Comic Book

Practical resources

- FLOSS Manuals. This portal offers manuals for different tools. All are in English and most in French. Some manuals are also available in Finnish, Dutch, Russian and Arabic. The manuals can be followed online or downloaded as either PDF or ePUB.
- 7 aplicaciones libres para editar tus videos (in Spanish).
- FOSS* video editing tools enable a better Indigenous languages audio-visual production.
- Amara – Video subtitling created by the Participatory Culture Foundation (PCF). This is a useful resource to create subtitles in Indigenous languages for educational materials.

"FLOSS Manuals imagotype" by Giovanni Alfredo Garciliano Diaz is licensed under CC BY-SA 4.0.

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Learning tasks and activities

1. Translate a popular song into one's own language. One interesting way to attract the attention of young people towards the language is by taking advantage of the popularity of certain songs. This could also help one find one's own rhythm in the language.
2. Give a traditional song in the language a modern spin. This may sound the opposite of the previous point, but it is just another way to update the musical repertoire in one's mother tongue.
3. Compose a completely new song or a poem in the language. Try it out with friends or with the community. Be bold. Talk about what is important for family, tradition, community, love or universal truths. Anything is possible. What's more, one can try to compose it without **neologisms***.
4. Write a new, fictional story or even a novel in the language. Traditional storytelling is important but also new narratives that reflect what it means to be a speaker of the language today.
5. Re-enact and film a story in the language. One can write down an old or new story. Imagine how one would act it out. When one is ready, ask somebody to film it. Or perform it live. What is important is to use the language on a new stage (literally).
6. Translate and/or publish a comic book. Try creating superheroes. Or illustrate a traditional story for children -or maybe even a ghost story.
7. Make a music video of one's favorite songs in one's own language. One can also try to add subtitles. And publish it online.

Measuring impact

New artistic media in Indigenous languages tend to have a more symbolic impact than a qualitative effect. What they represent is the possibility of continuing to create in a language that is generally considered out of use.

One good way of measuring the impact of creative expression in Indigenous, minority or under-resourced languages is in monitoring the reactions that different audiences have to it. Many Indigenous artists are taking to directly publishing their work online. If this is what one's own group, or community want to do, one can measure the size of your audiences quantitatively. One can have an idea of the impact of the work by looking at the number of views, likes, and shares that it gets. Perhaps more interestingly in terms of impact, one can also read and consider the comments that people leave in social media, like YouTube, Vimeo, Soundcloud, Facebook, etc. What are people saying about one's song, film, or comic book? Is it generating a conversation about the uses and possibilities of the language?[39]

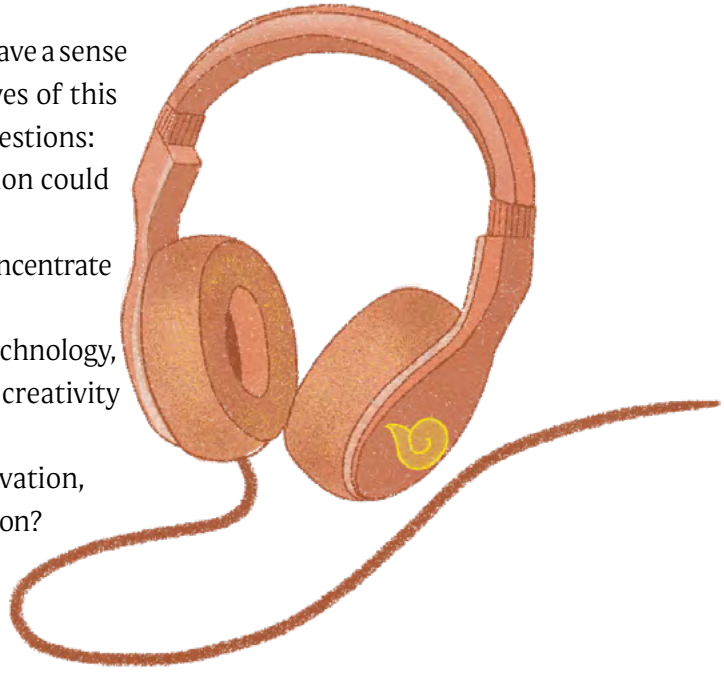
[39] Evaluating social media comments to Indigenous language artistic expression is used as an analytical approach by scholars, for example, Cru (2015).

Perhaps the ultimate way of measuring the impact of your artistic work in the language is the type of reactions one gets when performing it live, which may also involve reading poetry or stories aloud, or having a community screening of one's film.
Only a few Indigenous language artistic expressions find their way into the mainstream, but this may also have an impact on how people appreciate other expressions. The case of the film in Inuktitut, Atanarjuat, is exemplary. The movie might have been watched by no more than a few thousands, but the storytelling and cinematic expressions made it one of the most important Canadian films.[40]

Module self-assessment

This is the end of the Imagining approach module. To have a sense of whether one have completed the learning objectives of this module, please, consider and answer the following questions:

1. Is it clear what role artistic creativity and expression could play in the revitalization project?
2. What are the artistic fields that could be strategic to concentrate in the language revitalization project?
3. Can one identify the ways in which digital media, technology, resources and tools can support collaboration and creativity in artistic expressions related to the language?
4. What is the right balance between creative innovation, creativity, experimentation and continuity of tradition? Is it important to maintain? Why?



[40] Atanarjuat voted No. 1 Canadian film of all time

Key approach 7: Defending

spaces for indigenous languages and linguistic rights

This approach involves promotion of the Indigenous language users' rights in social and political domains, including access to digital technologies and communication, education, justice, health or political representation. It could take the form of preparing and circulating information in Indigenous languages concerning pressing issues, campaigning for more language content in mass media, or carrying out legal cases to protect Indigenous-owned digital networks.

Learning objectives

- To examine and discuss what role digital media and technologies play in exercising the **rights of Indigenous peoples***, and in particular, their linguistic rights.
- To consider the best possible ways in which **linguistic rights*** can be advanced through digital media and technologies.
- To consider the need to incorporate campaigning for linguistic rights as an important component of other forms of digital engagement.

Discussing this approach

The advancement of multiculturalism and the acknowledgement of the importance of cultural and linguistic diversity has yielded changes, both big and small, in the legal system of virtually every State in the world. For instance, during the 1990s and the 2000s many Latin American states introduced an explicit recognition to the multicultural foundations of their independent nations. This resulted in the passing of Indigenous rights bills in Colombia, Mexico, Guatemala, Ecuador, Peru, Brazil, Chile, and Bolivia (Plurinational State of), and many others. These same countries passed linguistic rights bills around the same time or a few years later.

Legal frameworks

The most recent amendments to national legal frameworks have been designed to protect the **rights of Indigenous peoples*** and other cultural minorities, notably in terms of language use and basic education in Indigenous languages, but also have been instrumental in introducing a series of new state-issued obligations in the domains of education, healthcare and governmental representation.

The enforcement and observance of these **linguistic rights*** has, however, not always happened and there is still a long way to go in many regions of the world for Indigenous

and other cultural minorities to be able to, as Miguel Angel Oxlaj, a Kaqchikel language defender in Guatemala put it, 'live in their own language'.

This important and pressing issue has been addressed by a few digital practitioners and organizations through online campaigns. Wikitongues, for instance, has used its platform to document languages but to also promote linguistic diversity with video clips that celebrate the multiple languages of their database. This forms a basis for a logic of recognition, but more can be done.

In Mexico, the organization CEPIADET (acronym of the 'Centro Profesional Indígena de Asesoría, Defensa y Traducción' or Professional Indigenous Center for Counseling, Advocacy and Translation) led an offline and online campaign in 2014 with the slogan 'Our Rights Live in All Languages' (Los Derechos Viven en Todas las Lenguas). During the pandemic, the organization has continued campaigning against racism and linguistic discrimination and has used their social media platforms (principally YouTube and Facebook) to disseminate their message. See videos Other citizen journalism media, like Vientos TV, have also contributed to the documentation of linguistic rights' abuses that are committed on a daily basis in Mexico. See, for example the testimony of a Maya speaking boy: The Right to Speak my Language. These are examples of what a few Indigenous language defenders could do to inform, disseminate and encourage people to exercise their linguistic rights.

Community-managed networks

Another important arena where **linguistic rights*** need to be exercised is in gaining more access to mainstream media and basic internet infrastructure and connectivity. In Mexico, the Telecomunicaciones Indígenas Comunitarias (Indigenous Community Telecommunications, TIC; see also the **Facilitating** approach), defended the right that Indigenous communities have to set up their own community-managed networks without having to pay the same taxes that big internet companies pay to the Mexican state. On 13 January 2021, after a nearly three-year legal battle, the First Chamber of Mexico's Supreme Court ruled in favor of the TIC, exempting them from paying for a concession license to use **radio spectrum***. This decision allows TIC to offer affordable cell phone services to Indigenous communities in the country. The court case also set a legal precedent for local communities to operate their own telecommunications services for free under social use concession licenses – drawing a line between commercial and community providers. The TIC case in Mexico exemplifies the legal recognition of the right to have community mobile and internet networks. For more on this case, see.

There are many other examples in which respect for linguistic rights has been encouraged using digital media and technologies, including educational resources that

are widely circulated online. A few of these have been included among the Inspiring Stories (see further below). They are related to social media campaigns in which the central message encourages Indigenous language users to get to know and to exercise their linguistic rights, challenging the widely observed stereotype that Indigenous, minority and other under-resourced languages have no value and are doomed to disappear. Unfortunately, the stigma and prejudice that discredit Indigenous languages and their users are accepted as common sense in different contexts. More needs and can be done to reverse these attitudes that have become normalized even within Indigenous linguistic communities. Indigenous people are often confronted with negative representations that frame their language knowledge and use as a liability for them and their families and that their children would be better off if they did not "become distracted" from learning "more valuable" languages by continuing learning and using their own language.

Story telling

Getting to know and understanding better the process through which Indigenous **linguistic rights*** have been recognized by different states could prove to be not just educational but inspirational to Indigenous language defenders and promoters. These histories are rarely unidirectional, or the movements centralized. In different countries, the actors, projects and legal battles that have contributed to strengthening Indigenous rights have been diverse and not all their stories have been told or are currently known. One of the case studies included in the toolkit consists of the creation of a database for future language defenders and promoters that integrates the multiple stories, successes, and failures, that have occurred in the long journey for the recognition of Indigenous language rights in Australia.

In conclusion, the encoding of linguistic rights in national law does not in itself guarantee that those rights would automatically be exercised. Digital practitioners working in favour of Indigenous and other minority languages exercise these rights through their media engagement, but more can and needs to be done to educate the public (Indigenous and non-Indigenous) about the importance of multilingualism and cultural diversity. Members of many **minoritized*** linguistic communities have been made to believe that the marginalization of their languages is a natural process. The legal recognition and protection of linguistic diversity in the world needs to be better known and defended. This module has included among its Tools and Resources some of the most important legal frameworks and declarations, both national and international, that have contributed to these processes (see, especially iii. Legal resources). Educational campaigns, as well as digital and social media produced by language defenders and promoters could also make a difference if prioritizing this in their work.

Inspiring Stories
(Case studies)

1 Jarrak: Our languages journey
Australia

- **Languages:** Walmajarri, Nyikina, Kija, Bunuba, and various others Australian languages.
- **Practitioners:** Kimberley Language Resource Centre and First Languages Australia.
- **Site:** https://jarrak.com.au/

Description: Jarrak is a public knowledge bank which captures key milestones for strengthening Aboriginal and Torres Strait Islander languages from the 1970s until now. It has been published to support both on-going advocacy and effective progress for revival and maintenance of Indigenous languages. Aboriginal and Torres Strait Islander language programs and workers across the continent often operate in isolation, in under-resourced circumstances, and with languages that are at different stages in the revitalisation process. Jarrak includes an interactive timeline and a searchable database, with links to documentary and audio-visual evidence of achievements made in four areas: policy, education, language centres and resources.

Inputs & Resources: This project benefited from receiving a Sydney Policy Lab Fellowship, by the University of Sydney. The fellowship allowed one member of First Languages Australia to work on the knowledge bank at the university, with support from the School of Education and Social Work in 2018.

Tools used: The knowledge bank uses TimelineJS, an open-source* tool that enables anyone to build visually rich, interactive timelines. This tool was created by Knight Lab at Northwestern University (USA). This is "a community of designers, developers, students, and educators working on experiments designed to push journalism into new spaces".

Reception: The site allows language groups to share their successes, trials and tribulations to aid other communities that might not be gaining the same traction in their own language development. Carolyn Barker of First Languages Australia said Jarrak has been a highly collaborative process. "It's a living and growing collection," she said. The documents have come from old files, bookshelves and hard drives of community members that were sent to First Languages Australia specifically for the website.

To know more:

- Jarrak: Our languages journey
- The launch of Jarrak: Our languages journey
- Endangered Indigenous languages find new voice thanks to Jarrak public knowledge bank.

Inspiring Stories
(Case studies)

2 Campaign #MiIdiomaMiDerecho (#MyLanguageMyRight)
Guatemala

- **Languages:** 22 languages of the Mayan family (Achí, Akatek, Awakatek, Chalchitek, Ch'orti, Chuj, Itzá, Ixil, Jakaltek Popti', Kaqchikel, K'iche', Mam, Mopan, Poqomchi', Poqomam, Q'anjob'al, Q'eqchi', Sakapultek, Sipakapense, Tektitek, Tz'utujil, Uspantek)
- **Practitioners:** Academia de las Lenguas Mayas de Guatemala (Academy of the Mayan Languages of Guatemala - ALMG)
- **Site:** Youtube playlist

Description: Between 2019 and 2020, the Academia de Lenguas Mayas de Guatemala launched an internet campaign with the hashtag #MiIdiomaMiDerecho (#MyLanguageMyRight). This campaign also produced radio messages, social media posts, and short video clips with the message in several Mayan languages of Guatemala (see playlist). The message that these videos convey is that Maya people should respond to those situations by getting to know their rights. See one of the clips in the Sakapultek language.

Inputs & resources: The ALMG is an autonomous agency within the Guatemalan government. It has its own annual budget provided by the National government through the Ministry of Public Finances.

Tools used: The videos are hosted on YouTube and the radio messages circulated on Soundcloud.

Reception: The campaign accompanied the celebration of the International Year of Indigenous Languages 2019. The YouTube videos have been viewed between 40 and 600 times. The videos were also published on Facebook where they had a slightly better reception. On this platform, some videos reached more than 800 and even more than 1.2K views. Viewers were able to re-share these short clips on this platform.

To learn more:

- (In Spanish) Campaña promueve la preservación y uso de los idiomas mayas en Guatemala (Campaign promotes the preservation and use of Mayan languages in Guatemala)

Inspiring Stories
(Case studies)

3 Our roots, Our language (AIPP)
China, India, Bangladesh, Myanmar, Thailand, Laos, Malaysia, and Nepal

- **Languages:** Iu Mien, Kok Borok or Tripura (Tiprakok), Jinghpaw (Jingpho or Kachin), Karen (S'gaw K'Nyaw), Hajong, Northern Thai (Lanna or Kham Mueang), Dusun Llivagu (Bunduliwan), Boro (Bodo), Karbi, and Thangmi (Thāmī or Thani)
- **Practitioners:** Asia Indigenous Peoples Pact
- **Site:** Campaign Video, AIPP statement that accompanies the video campaign; Related media.

Description: Early in 2021, the AIPP launched a campaign using their web platforms to celebrate the International Mother Language Day. One key element of the campaign consisted of a 7-minute video where AIPP member shared the importance that their Indigenous languages have for them. This included presentations in 11 Indigenous languages of Asia. The video was intended as a way of actively fostering multilingualism for inclusion in education and society and had almost 1,000 views since publication on Facebook.

Inputs & resources: AIPP raises funds and receives donations according to the Ethical standards stated in their fundraising policy. This guides the Indigenous Pact in seeking partnerships with foundations and institutions that do not harm Indigenous peoples, women and children, persons with disabilities, LGBTQ+ people, or any other marginalized population.

Tools used: The video for this campaign was shot using different cameras, some from mobile devices and some from desk computers.

Reception: The campaign was reported by Asian Indigenous languages defenders and promoters as a good example of digital engagement, during the survey conducted for the creation of this toolkit.

To learn more:

- The rights of Indigenous peoples in Asia (Stefania Errico, ILO report)
- Information center about the Indigenous Peoples of Asia response to COVID-19 pandemic.

Tools & Resources

Key Resources

- Language Rights of Linguistic Minorities: A Practical Guide for Implementation. Published by the United Nations Special Rapporteur on minority issues
- Convention for the Safeguarding of the Intangible Cultural Heritage (UNESCO)
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions (UNESCO)
- Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace (UNESCO)
- African Union's Cultural Charter for Africa (African Union)
- African Charter on Human and Peoples' Rights (African Union)
- The European Charter for Regional or Minority Languages (ECRML)

Practical resources

- Make a Timeline with TimelineJS. Beginners can create a timeline using nothing more than a Google spreadsheet.
- Five ideas to support Indigenous language revitalization in Canada – NETOLNEW project.

In 2018, the Canadian Commission for UNESCO published a three-page quick-facts and tips guide to Indigenous languages in Canada. The guide was compiled by Onowa McIvor (Indigenous Education, University of Victoria) and it provides current information about Indigenous languages in Canada and a list of ways one can help support them.

The University of Victoria produced a short video to highlight five ways in which people can promote and respect linguistic diversity in Canada. These are:

1. Learn a greeting – and a response! – in the Indigenous language of the region and use it often.
2. Learn more Indigenous languages words and phrases using smartphone apps.
3. Learn the names of mountains, lakes, rivers, and towns in a local language.
4. Watch a movie or TV show in an Indigenous language.
5. Listen to artists who sing in their Indigenous language.

Legal resourses

- Aboriginal Languages Act 2017 (Australia)
- Te Ture mō Te Reo Māori 2016 / Māori Language Act 2016 (New Zealand)
- Indigenous Languages Act; S.C. 2019, c. 23(Canada)
- Ley General de Derechos Lingüísticos de los Pueblos Indígenas (Mexico)
- Ley de Idiomas Nacionales (Guatemala)
- Ley de Lenguas, Ley 1381(Colombia)
- Reforma de la Ley de Idiomas Indígenas, 2021 (Bolivarian Republic of Venezuela)
- Ley Nacional de Lenguas , Ley No. 29735 (Perú)
- Ley General de Derechos y Políticas Lingüísticas, Ley No. 269 (Plurinational State of Bolivia)
- European Charter for Regional or Minority Languages (European Union)
- Native American Languages Act; Public Law 101-477 (United States)
- The Esther Martinez Native American Languages Preservation Act (United States)

Learning tasks and activities

1. Do some research about what laws protect linguistic rights in the relevant country or region. One cannot defend what one does not know. Some countries have a distinctive bill of rights that protects Indigenous and minority languages, but others have several provisions in different legal documents.
2. Translate the national linguistic rights bill into the intended language. This way, members of the relevant linguistic community will be able to communicate (and exercise at the same time!) their linguistic rights.
3. Discuss best practices for disseminating and defending linguistic rights with the group, organization, or community.
4. Create informative media about language rights in the language (such as video testimonials, re-enactments, stories, podcasts, songs and comic books).

Measuring impact

Perhaps the best way to measure the effectiveness of this form of digital engagement is by monitoring the enforcement of linguistic rights in the community or region. The following are only a few questions that this exercise could consider:

- Are the language users (speakers and signers) appropriately informed about their linguistic rights?
- Do government officials know about these rights?
- Do government institutions and officials offer official information in the language, institutional services in the language, or the proper service of an interpreter?
- Are language users (speakers and signers) confident that their linguistic rights are or will be respected?

Linguistic rights observance can also be measured by the presence of languages in mainstream media. How many hours of programming are offered in Indigenous or minority languages? At what hours? In how many different media? Do these correspond to what the law mandates?

Module self-assessment

This is the end of the Defending approach module. To have a sense of whether one has completed the learning objectives of this module, please, consider and answer the following questions:

1. Can the reader now identify the reasons why linguistic rights recognized by the constitution and legal frameworks in any given country continue to be vulnerable?
2. How can digital engagement contribute to strengthening linguistic rights in the relevant context?
3. Is it clearer now how social media work, including online campaigning, can be linked more explicitly to the defense of linguistic rights?
4. Are there areas within national jurisdiction that the reader considers to be important to know and to inform members of their community about?
5. What could be the most effective ways to make other users of the language (and non-speakers and signers) aware about their linguistic rights?

Key approach 8: Protecting
indigenous linguistic heritage and communities

While it can be said that all previous propositions aim to protect Indigenous languages from displacement or loss, this key approach tackles the important issue of **intellectual property*** associated with linguistic heritage. Digital documentation, online publication and public use of language materials can potentially be a highly sensitive matter for Indigenous communities and individuals. As part of this, Indigenous protocols and best practices are documented and promoted through specific tools and resources, such as Indigenous-controlled **CMS (Content Management Systems)*** and Traditional Knowledge labels.

Learning objectives

- To examine how the documentation and dissemination of Indigenous languages and cultural heritage can make them vulnerable to **cultural misappropriation*** and plagiarism.
- To explore ways of incorporating protections and **Indigenous protocols*** in the management of online archives and curatorial projects.
- To identify and understand how digital engagement in favour of Indigenous languages can expose certain individuals and sectors to sexual harassment and cyberbullying.
- To analyze other potential vulnerabilities that affect Indigenous peoples and communities in their relationship with digital media and online communication, such as misinformation and hate speech, as well as during the COVID-19 pandemic and conflict situations.

Discussing this approach

Languages are containers of knowledge and cultural information that are of great value to the peoples and communities who have maintained those languages through years of historical subjugation. While digital engagement in favour of Indigenous languages implicitly involves issues related to openly licensed materials, recordings and knowledge, there are still several important considerations related to the protection of Indigenous **intellectual property*** that have been raised by Indigenous digital practitioners.

Open Access (OA)

The Berlin Declaration on 'Open Access to Knowledge in the Sciences and Humanities'[41] defines this concept as: 'free access to information and unrestricted use of electronic resources for everyone. Any kind of digital content can be OA, from texts and data to software, audio, video, and multimedia. While most of these are related to text only, a growing number are integrating text with images, data, and executable code. OA can also apply to non-scholarly content, like music, movies, and novels'.

Yet, what the declaration does not consider is the fact that marginalized peoples' knowledge may still be in need of special protections and provisions, which could limit its circulation as **Open Access*** content. This is the case of Indigenous oral histories, stories, sayings and proverbs, songs, plays, dances, designs, personal images, and even names of peoples, which have often, historically, been misappropriated and misused by powerful actors, including States and private companies. For example, Indigenous names have been used for names of cars; for software; for varieties of strawberries. These examples of commercialization of Indigenous heritage can be severely damaging and affect processes of linguistic and cultural revitalization by perpetuating outdated associations and ideologies about indigenous people. This only adds to the historical conditions of discrimination, exclusion and exploitation to which many of these language users (speakers and signers) have been subjected. In this sense, the **cultural misappropriation*** of linguistic and related cultural heritage must be prevented.

Attention to these concerns has led to the systematization of **Indigenous** rules and **protocols*** for the protection of knowledge, which includes language. This process has been led by Indigenous leaders, allied scholars and universities, particularly in North America and Asia-Pacific, where ethical guidelines that apply to research have been extended to include various forms of online work, documentation, curation, and dissemination of heritage.

The **Creative Commons*** movement has acknowledged that: 'Reuse freedoms associated with public domain materials, and fostered through **digitization***, can create tension when it comes to Indigenous cultural heritage. Existing copyright law, steeped in Western concepts and values, does not adequately protect Indigenous traditional cultural expressions, nor does it sufficiently reflect or account for Indigenous cultural values. By default, many forms of Indigenous heritage or 'traditional cultural expressions' (which may include secret, sacred, or sensitive content) are inequitably deemed public domain under conventional copyright law.'[42]

[41] Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities.

[42] Sharing Indigenous cultural heritage online: An overview of glam policies.

As New York University professor and legal scholar Jane Anderson explains: '**Indigenous protocols*** around the use of knowledge are nuanced and complex and do not map easily onto current legal frameworks. For instance, some information should never be shared outside a community context, some information is culturally sensitive, some information is gendered, and some has specific familial responsibilities for how it is shared. Some information should only be heard at specific times of the year and still for other information, responsibility for use is shared across multiple communities.'[43] These forms of understanding ownership and/or origin attribution are not necessarily easy to contain in the four **Creative Commons*** licenses through which most **Open Access*** content is shared.

Data collection

Further to this, there is a growing preoccupation about the future impact that massive data collection and processing would have on Indigenous languages. For example, Te Hiku Media, a small radio station and tech start-up in New Zealand, became a pioneer in Indigenous speech recognition technology in 2018. Their success generated interest from big companies that wanted to buy their data to commoditize speech-to-text services in the Māori language.[44]

Concerns such as this have led to a quest to find effective ways of protecting the intellectual and cultural stewardship that Indigenous peoples and other minority communities exercise over their linguistic heritage, as well as their inventions and traditions. Among those initiatives are two of the Inspiring Stories of this module: *Mukurtu CMS* and the *Local Contexts Hub*. These two projects represent concrete developments in a field of methods and practices connected by the notion of **Indigenous Data Sovereignty (IDS)***. Rainie et al. (2019) define IDS as 'the right of Indigenous peoples to govern the collection, ownership, and application of data about Indigenous communities, peoples, lands, and resources. Indigenous data is defined here as data in a wide variety of formats inclusive of digital data and data as knowledge and information. It encompasses data, information, and knowledge about Indigenous individuals, collectives, entities, lifeways, cultures, lands, and resources'.[45]

[43] Is it possible to decolonize the commons? An interview with jane anderson of local contexts.

[44] Māori are trying to save their language from Big Tech.

[45] Indigenous Data Sovereignty.

Effective communication in Indigenous languages

On the other hand, protecting languages should also mean protecting the peoples who speak the language. In relation to this, Mexico's National Agency for Indigenous and Popular Cultures launched the campaign #NoHayLenguaSinPueblos (#NoLanguageWithoutPeoples) in 2019 to highlight that respecting the lives and rights of Indigenous peoples is a prerequisite for the protection and preservation of languages. This has become even more significant during the COVID-19 pandemic. Several Indigenous digital practitioners have pointed out that the response on the part of governments and health agencies has lagged or been completely non-existent when it came to sharing information about the virus in Indigenous languages. In a similar vein, UNESCO has expressed the view that more effective communication in Indigenous languages is necessary to protect communities against misinformation.[46]

Protection of female digital practitioners

Finally, it is also important to consider as a matter of interest the need to protect the safety of Indigenous digital practitioners when they develop their promotion and advocacy activities online. Two of the most aggravating threats they face are cyberbullying and sexual harassment.

Female language defenders and promoters are the most exposed to this latter threat since they are often more active and open when promoting their languages online. They also tend to be assigned the preservation of the language from within the community, which signals a strong gender bias. Female digital practitioners are often victims of sexual harassment and racist attacks due to their gender and cultural identities. As the introduction to the Safe Sisters training initiative puts it: 'When women enter an online environment, they face a disproportionate risk of digital harassment, cyber stalking, **doxing***, or the non-consensual distribution of images (i.e., 'revenge porn'). Online violence has proven an especially powerful tool for undermining female (and female-identifying) human rights defenders and civil society leaders, because the brutal response they face online also serves to endanger, discredit, shame, or defame them offline.'

These are the main reasons feminist digital practitioners have developed guides, toolkits, cybersecurity strategies training programs to respond to these situations. Safe Sisters is a fellowship programme that has produced digital guides as well as a more in-depth training to women human rights defenders, media workers and different types of practitioners. These strategies and resources could be important to consider when doing language revitalization projects online, too. This is especially relevant when pursuing the **Multiplying** approach.

[46] Media and Communications with indigenous peoples in the pandemic.

Inspiring Stories
(Case studies)

1 Mukurtu – Content management system for traditional knowledge

Australia and The United States

- **Languages:** Australian, Northwestern American and Polynesian Indigenous languages and other digital heritage.
- **Practitioners:** Indigenous institutions, museums and archives, as well as Indigenous heritage preservation institutions.
- **Site:** Mukurtu CMS

Description: In 2007, Warumungu community members collaborated with Kim Christen and Craig Dietrich to produce the Mukurtu Wumpurrarni-kari Archive. Mukurtu is a Warumungu word meaning 'dilly bag' or a safe keeping place for sacred materials. Warumungu elder, Michael Jampin Jones chose Mukurtu as the name for the community archive to remind users that the archive, too, is a safe keeping place where Warumungu people can share stories, knowledge, and cultural materials properly using their own **Indigenous protocols***. Mukurtu is a **free and open-source*** community archive platform designed with the unique needs of Indigenous communities, libraries, archives, and museums in mind. Mukurtu is built on the Drupal **content management system*** with a set of features aimed at Indigenous cultural heritage management needs. Mukurtu CMS is managed by the Center for Digital Scholarship and Curation at Washington State University (USA). Mukurtu CMS, Mukurtu Support resources, and all materials on mukurtu.org are distributed under the terms of the GNU General Public License version 3 (or 'GPLv3'), which means anyone is free to download and share them with others. Cultural **Indigenous protocols*** are the core of Mukurtu CMS. Protocols allow one to determine fine-grained levels of access to digital heritage materials based on community needs and values. Protocols make it possible to define a range of access levels for digital heritage objects and collections from completely open to strictly controlled and it is easy to change a protocol with just a few clicks.

Inputs & Resources: Mukurtu is funded in part by the National Endowment for the Humanities, the Institute of Museum and Library Services, Andrew W. Mellon Foundation, and the National Science Foundation.

Tools used: Mukurtu is built on the architecture of Drupal. This is a **free and open-source* content management platform (CMS)***, written in **PHP*** and distributed under the GNU General Public License.

Reception: Several Indigenous communities and institutions in Australia and the US have been working for a few years with the platform and supported its development. They receive assistance and also provide training to other communities and institutions. Mukurtu has created Regional Hubs and Spokes. Regional Mukurtu Hubs are centres for support, development, and deployment of Mukurtu CMS to Community Spokes and other interested individuals and organizations in their areas. The hubs work with dozens of community and organizational 'spokes' and their support networks continue to grow.

To know more:

- Mukurtu: an online dilly bag for keeping Indigenous digital archives safe.
- Mukurtu: A Digital Platform That Does More Than Manage Content.
- Examples of Indigenous Digital Archives that use Mukurtu:
  - The Catawba Dictionary.
  - The Plateau Peoples' Web Portal.

Inspiring Stories
(Case studies)

2 Local Contexts - Traditional knowledge labels
United States, Canada, New Zealand and Australia

- **Languages:** Musqueam, Sto:lo, Karuk, Eastern Abenaki, Maliseet–Passamaquoddy, and Māori, among many others.
- **Practitioners:** Local Contexts and various Indigenous communities and institutions.
- **Site:** Local Contexts.

Description: Local Contexts was founded by Jane Anderson and Kim Christen in 2010. The primary objectives of Local Contexts are to enhance and legitimize locally based decision-making and Indigenous governance frameworks for determining ownership, access, and culturally appropriate conditions for sharing historical, contemporary and future collections of cultural heritage and Indigenous data. Local contexts is focused on increasing Indigenous involvement in data governance through the integration of Indigenous values into data systems. Local Contexts offers digital strategies for Indigenous communities, cultural institutions and researchers through the Traditional Knowledge (TK), Biocultural Labels and Notices (BC), which are understood as a part of community data. This allows communities to express local and specific conditions for sharing and engaging in future research and relationships in ways that are consistent with existing community rules, governance, and protocols for using, sharing, and circulating knowledge and data. Together they function as a practical mechanism to advance aspirations for **Indigenous Data Sovereignty*** and Indigenous innovation.

Inputs & Resources: Local Contexts is supported by the National Endowment for the Humanities (USA), New York University, Washington State University, the Andrew W. Mellon Foundation, ENRICH, IDIA and the University of Waikato.

Tools used: Participating Indigenous communities, and institutions, as well as external researchers have to first join the Local Contexts Hub. The hub works in tandem with already existing information/collections management systems and tools, like Mukurtu. The hub generates Labels and Notices (with permanent identifiers) so these can be added into already existing catalogue and collections management systems. It uses Application Program Interfaces (API)* for this.

Reception: The project has been developed in close consultation and co-design with several Indigenous communities and institutions. Their formal launch was highly anticipated and there is a lot of interest about what the TK and BC labels and notices could do for the protection of Indigenous intellectual property in the near future.

To know more:

- Who Owns an Ancestral Photo, Song, or Language?
- Is it possible to decolonize the Commons? An interview with Jane Anderson of Local Contexts.
- Library of Congress (USA). Collection 'Ancestral Voices' – Rights and Usage.
- Tribal Archives, Traditional Knowledge, and Local Contexts: Why the 's' Matters.

Inspiring Stories
(Case studies)

3 VirALLanguages and CIELO'S COVID-19 Resources

Cameroon, Ghana, Indonesia, Pakistan, Colombia, Guatemala, Mexico, and Peru.

- **Languages:** Aghem, Ajumbu, Babanki, Bafut, Giziga, Sumba Timur, Kapuas Hulu, Burushaski, Gujari/Gojri, Hindko, Ushojo, Wakhi, Embera, Garifuna. Guna/Kuna,Guarijío, Hñähñu/Ñanhú/Otomi, Jñatjo/Jñartjo/Mazahua, Ku'ahl, Popoluca,Quechua, Raramuri/Tarahumara, Purépecha, Tlahuica, Totonaco, Wixarika/Huichol, Yaqui, Yegatu, Yoremnokki/Mayo, Zoque, among many others.
- **Practitioners:** VirALLanguages and Comunidades Indígenas en Liderazgo (CIELO - Indigenous Communities in Leadership)
- **Site:** VirALLanguages and My Cielo.

Description: There were two parallel and equally important initiatives involving the use of Indigenous languages during the COVID-19 pandemic period. One was VirALLanguages.org, and the other was led by the organization CIELO.

The project VirALLanguages wanted to reach as many people as possible sharing reliable and memorable information, so people know what to do to stop the spread of COVID-19. Reaching as many people as possible means finding different ways to share lifesaving information in different languages and media. The principal outputs of virALLanguages were video and audio recordings in minority, endangered, or otherwise marginalized languages of the world. They disseminated their output through two main channels: a YouTube channel and a Facebook page. In addition, where possible, they supported dissemination of correct and memorable information on how to stay safe from coronavirus in local radio stations. They relied on volunteers to do the translation, recording and edition of messages.

CIELO, Comunidades Indígenas en Liderazgo (Indigenous Communities in Leadership), is an Indigenous women-led non-profit organization that works jointly with Indigenous communities residing in Los Angeles, United States. One of their priorities is to fight for social justice through a cultural lens. The fight for social justice includes ending gender-based violence, providing language access rights, cultural preservation, and reproductive justice. CIELO is a link, a resource, and a liaison for migrant Indigenous communities residing in Los Angeles. They created and compiled an open database of Indigenous language media related to the COVID19 pandemic.

Inputs & Resources: Both initiatives relied on the work of volunteers. virALLanguages had a few institutional partners: the KPAAM-CAM project at University at Buffalo, SUNY, SOAS World Languages Institute, at University of London, UK, Community for Global Health Equity at University at Buffalo, SUNY, and the Department of Linguistics at the University of Hawai'i in Mānoa.

Tools used: Most of the videos and audios were collected online. virALLanguages' own-produced videos were published on YouTube and also stored in Archive.org Dissemination of the information happened on different social media, like Instagram, Facebook, WhatsApp and Twitter.

Reception: Distribution of information (videos and audios) has been widespread using social media channels, including VirALLanguages's dedicated YouTube and Facebook channels, as well as through CIELO's database-centered linguistic advocacy.

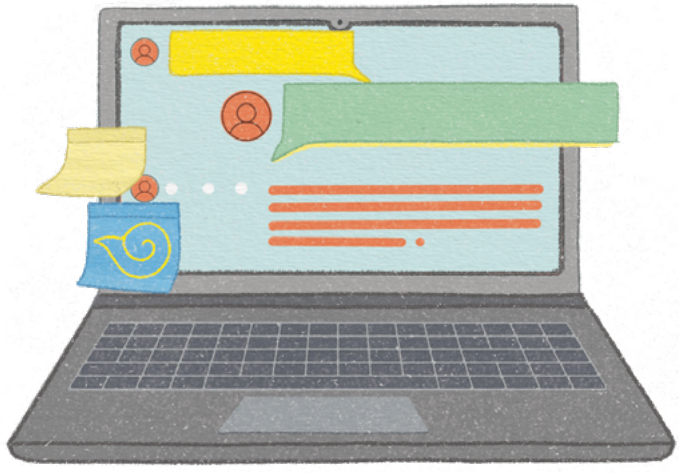
To learn more:

- Covid-19 Is History's Biggest Translation Challenge.
- Promoting coronavirus education through Indigenous languages.
- ONG comparte lista de videos en lenguas indígenas sobre el Covid-19: "NGO shares a list of videos in Indigenous languages on the subject of the pandemic".
- Inmigrantes indígenas, una de las comunidades más vulnerables ante la pandemia del coronavirus: "Indigenous immigrants: one of the most vulnerable communities before the Coronavirus pandemic".

Tools & Resources

Key Resources

- **ECRML Sharing local openly licensed content to inform communities across Africa about COVID-19.** The online campaign "Don't go Viral" was launched by UNESCO, in partnership with the Innovation for Policy Foundation (i4Policy), to address the urgent need to ensure access to culturally relevant and openly licensed information in local African languages in order to facilitate awareness-raising about how to mitigate the spread of COVID-19 in Africa.
- Sharing Indigenous Cultural Heritage Online: An Overview of GLAM (Galleries, Libraries, Archives, and Museums) Policies – **Creative Commons.**
- Digital Stewardship Curriculum Page – **The Sustainable Heritage Network.**
- The curriculum covers all aspects of the Digital Stewardship Lifecycle – bringing materials in, managing and organizing materials, preserving materials, and providing access to materials – all the way from physical materials to digital files.
- **Indigenous IP Support Services – Enrich Hub** Indigenous IP Support Services provide educational and template agreements that address the legal, non-legal, and ethical frameworks of practice affecting the protection of Indigenous intellectual and cultural property.
- Resources - Intellectual Property Issues in Cultural Heritage (IPinCH) – IPinCH project, Simon Fraser University.
- Intellectual Property and Traditional Cultural Expressions/Folklore – World Intellectual Property Organization (WIPO).



Toolkits

- Documenting Traditional Knowledge – A Toolkit. World Intellectual Property Organisation (WIPO) Available in English, French, Spanish, Arabic, Chinese, and Russian.
- Gender and Tech Resources – **Tactical Tech.** Most Indigenous language defenders and promoters are women. They face different challenges than men in their access to digital technologies. These courses and training aim to facilitate the adoption of technologies for gender equality.
- Safe Sisters – Internews and DefendDefenders. Booklets that alert women human rights' defenders, journalists and practitioners about potential dangers they might face online. The goal is to make online safety less complicated for everybody. This platform also offers a Digital Security Trainer's Assistant guide, an easy-to-follow resource to learn and train. Areas that these resources explore are: Online Safety, Cyber-Harassment, Online Bullying. Available in English, Kiswahili, Burmese, Amharic, Tamil and Sinhala.
- Factshala Resources – **India Media Literacy Network.** This set of resources help promote grassroots media literacy and prevent spread of misinformation.

Learning tasks and activities

1. Conduct research on the national legal frameworks in place in relation to intellectual property protection, in particular what concerns Indigenous cultural heritage and languages.
2. Discuss and identify the most vulnerable cultural elements that need protection against **cultural misappropriation***.
3. Establish collaborative community protocols designed to protect language and cultural heritage from misappropriation.
4. Design a strategy to protect individual language defenders and promoters in the group or community.

Measuring impact

Some of the activities related to this approach could perhaps be evaluated in a similar way to the **Reclaiming** approach module. This is, in terms of:

- Usability of the safeguarding protocols. Are they easy to understand and implement by community practitioners and non-experts?
- Identification by language users (speakers and signers). Are speakers familiar with the principles established in the safeguarding protocols? Did they participate appropriately in their definition?
- The translation of medical information can only be evaluated by language users (speakers and signers). Do they correctly understand the risks of the pandemic? Can they explain back the information that has been shared with them?

Finally, protection against harassment and cyberbullying can only be measured by how well it maintains the personal integrity and collaborative energy of the people it aims to shield from those attacks.

Module self-assessment

This is the end of the **Protecting** approach module. To have a sense of whether one has completed the learning objectives of this module, please, consider and answer the following questions:

1. Are the risks of cultural misappropriation and plagiarism related to the circulation of language and cultural heritage clear to you now?
2. Can one identify one or two solutions for the protection of Indigenous knowledge associated with language?
3. What are the risks that Indigenous digital practitioners, especially women, face in their online work? Does one know where to find information that could help against sexual harassment and cyberbullying online?
4. Can one identify the vulnerabilities associated with the spread of misinformation through digital media and devices? How can this be combatted?
5. If one was to teach this module, how best would one approach it?
6. Draw a diagram, mind map or poster to show thoughts, questions and areas of further knowledge in relation to the contents of the module.[47]

[47] Questions 5 and 6 have been suggested by our colleague Adéṣínà Ọmọ Yoòbá.

CHAPTER

7

Final Thoughts / Looking Forward

Final thoughts / Looking forward

The future of linguistic diversity online

In 2015, journalist Holly Young posed the following points - which speak directly to the importance of linguistic diversity in cyberspace[48]:

'Does the language you speak online matter? The unprecedented ability to communicate and access information are all promises woven into the big sell of the internet connection. But how different is your experience if your mother tongue, for example, is Zulu rather than English? [...] It determines how much – if any – information you can access on Wikipedia. Google searching "restaurants" in a certain language may bring you back ten times the results of doing so in another. And if your language is endangered, it is possible it will never have a life online. Far from infinite, the internet, it seems, is only as big as your language.'

This toolkit and its many examples of the efforts led by Indigenous people to promote their languages, and with them, their cultures, histories and unique forms of knowledge are a rejoinder to these important questions posed by Young. The response offered by this toolkit is, however, necessarily incomplete, as the universe of projects that language users/speakers are currently pursuing is very dynamic and ever expanding.

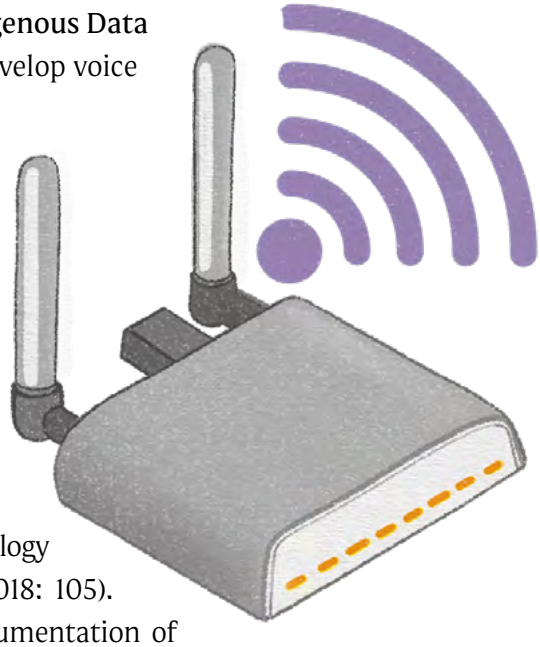
The internet as a global corpus for language documentation

Linguist Gretchen McCulloch has observed that because of the internet and mobile devices we now have 'an explosion of writing by normal people. Writing has become a vital, conversational part of our ordinary lives' (2019: 2). This statement, which in McCulloch's analysis applies to well-resourced languages, can be also said to be true for Indigenous languages, although in a more complex way. In the characterization of this toolkit's case studies it is possible to appreciate that the possibility of constantly publishing multimedia materials (images, audio and video) combined with the perceived informality of much internet communications have encouraged thousands of Indigenous speakers to express themselves in their languages and represent them in more dynamic ways. However, as it was discussed in this toolkit, the challenge of **standardization*** of writing in Indigenous languages would seem to limit the potential that this medium offers for language revitalization. Perhaps it is time for **automated text*** and **language processing*** engines to consider more seriously the many alphabets, scripts and forms of written representation through which Indigenous, minority and under-resourced languages exist online.

[48] Young, H. (2015). The Digital Language Divide (interactive). The Guardian, 28 May 2015.

The conclusion is that, as was highlighted at the beginning of this toolkit, neither the internet nor digital media and technologies will protect or save by themselves the more than 6,500 languages currently under threat. They are instruments for the strengthening and protection of languages that require careful and reflexive appropriation and use, and which this toolkit aims to be an aid for.

These considerations are important at a time when companies are turning their eyes to hundreds of endangered languages in an attempt to use their technological power to preserve this diversity while also securing a segment of the language service market that goes with it. In the case of Indigenous peoples' languages and cultures, this toolkit has merely introduced the ethical considerations that must be included in the development of such projects. As with previous moments in the history of Indigenous technological appropriations, **artificial intelligence***, natural **language processing*** and **automated speech recognition*** and voice processing could provide a crucial boost to language revitalization efforts, but these technologies need to be developed in accordance to the rights and provisions set by, among others, the Universal Declaration on the **Rights of Indigenous Peoples*** and the principles of **Indigenous Data Sovereignty*** (see Kukutai & Taylor 2016). Yet, the need to develop voice recognition, machine translation, speech processing, and text analysis technologies for Indigenous languages cannot be overstated.[49]



This other form of digital divide has to be considered together with the question of Internet Universality, which was briefly discussed in relation to the Facilitating approach. Indigenous people and communities have uneven and often expensive access to internet and digital infrastructure, and yet, as Hawaiian linguist Candace Kaleimamoowahinekapu Galla highlights, even if access to all the new technologies is guaranteed, the digital divide will not be bridged 'without an understanding of how technology is adapted, adopted, developed, promoted, or abandoned' (2018: 105). This calls for a continuous reflexive as well as practical documentation of Indigenous adaptations of digital technologies. Once more, this toolkit is just a first step in that direction.

Since his first report (see, Llanes-Ortiz, 2016), the author has found that it is the inventiveness and creativity of Indigenous digital practitioners that has enabled their tactical use of the internet and digital media to promote their languages. Cultural institutions, governmental agencies as well as research centres can be great partners

[49] Digital devices snub Icelandic language, which is a problem for Iceland.

in this process (as reported in many examples contained in the toolkit). However, the linking between scientific documentation and practical use of linguistic materials cannot be effectively created without the self-motivated grassroots work, both online and offline, that Indigenous language users/speakers do. The presentation of each of this toolkit's case studies has included a brief discussion of the financial sources that contributed to setting up the initiatives. Unsurprisingly the wider reaching projects have enjoyed support from often earmarked funds to promote linguistic diversity at the national level. There are, however, dozens if not hundreds of projects that mostly depend on voluntary work and small contributions by interested parties, like Indigenous individual or collective patrons. For many of these digital practitioners, their love for their languages and their enthusiasm have to be balanced with daily economic demands. Therefore, it would seem important that this language revitalization energy should be accompanied by a steady source of material, training and economic support at the national, regional and international levels. It has not been clear to the creators of the toolkit where those sources can be found but a dynamic database of such funding opportunities should be an integral part of any language revitalization strategy. The Global Plan for the International Decade of Indigenous Languages 2022-2032 should include this as an important item within its Resource Mobilization Strategy. Perhaps this could be another key approach in future versions of this toolkit, namely, how to ***Sustain,*** both financially as well as socially, language revitalization processes in the mid- and long-term.

Several case studies in this toolkit were selected as good examples of the advantages that **multimodal*** digital communication offers for Indigenous and other under-sourced languages. **Multimodality***, i.e., the layered and interrelated use of different forms of media and literacy in communication, should be explored and used more consistently as a key asset of digital engagement with and in favour of Indigenous and other under-resourced languages. The main challenge to do this has perhaps been rooted in a traditional understanding of educational communication, which still emphasizes reading and text over other forms of literacy. This occurs even when it effectively uses image, audio, and video, to create Indigenous language content. Multimodality is especially relevant when we consider not just Indigenous language speakers but also signers. More systematization and

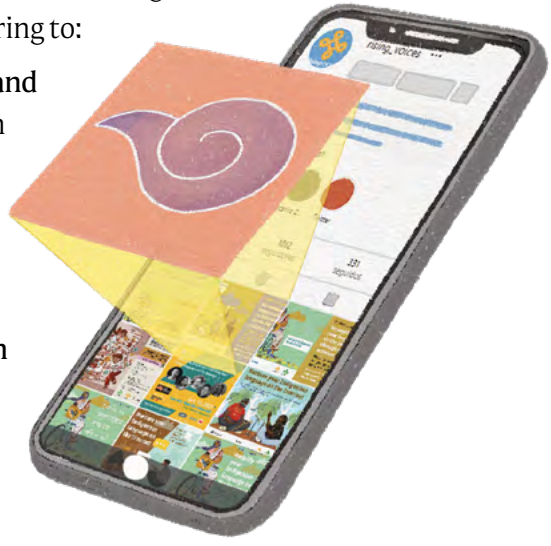
community-driven analysis need to be developed to take full advantage of the multiple forms of literacy that Indigenous peoples have maintained in correlation with their languages, such as landscape, seasonality, multiple temporalities, or **performance***, among others. Developing digital language communication skills that effectively use these various modes of communication not only will contribute to a more multilingual internet, but to a more intercultural one, too.

While the exercise of Indigenous **linguistic rights*** is inherent to most of the examples presented in this toolkit, a more explicit use of digital engagement to promote awareness of and to defend these same rights seems to be less frequent. Digital campaigning will be very advantageous in educating the public about the importance of multilingualism. More importantly, it could be highly effective to demand greater observance of linguistic rights from governments and the private sector, something that was generally under-reported by international partners in the creation of this toolkit. This should respond also to the implementation of the Global Communication Strategy within the Global Plan for the International Decade of Indigenous Languages, which is discussed next.

Opportunities for greater participation and deeper engagement during the International Decade of Indigenous Languages 2022-2032

The International Decade of Indigenous Languages 2022-2032 is a decade for everyone. Digital language defenders and promoters are key stakeholders for the achievement of the global outputs that the Global Taskforce has suggested for this international celebration. These are intended as contributions to the expansion of the functional scope for the use of Indigenous languages across socio-cultural, economic, and political domains (UNESCO 2021). Among such outputs the most relevant for Indigenous digital defenders and promoters are perhaps the ones referring to:

- Inclusive, equitable, intercultural, quality **education and lifelong learning environments** and opportunities in Indigenous languages provided in formal, non-formal and informal settings.
- Conditions established for **digital empowerment, language technology, freedom of expression, access to information, media development, and artistic creation** in Indigenous languages.
- Access to **justice and public services** in Indigenous languages ensured.



- Indigenous languages as a vehicle of **living heritage and biodiversity** promoted and **participation in and access to culture** in all forms enhanced for Indigenous peoples and Indigenous language users.
- Decent **employment opportunities and economic growth** through the use of Indigenous languages.
- **Gender equality and women's empowerment** resulting from Indigenous languages preservation, revitalization and promotion.

This without denying that digital practitioners have also much to contribute to achieving outcomes related to Indigenous health, eradication of hunger, food systems, biodiversity conservation, climate change adaptation, land restoration and water management, that have also been included in the Global Plan for the International Decade of Indigenous Languages 2022-2032.

In terms of the Global Communication Strategy, digital language defenders and promoters have a lot to contribute (as exemplified by the experiences contained in this toolkit) when it comes to:

- Inform about the importance of Indigenous languages for societal development.
- Create greater awareness about critical loss of Indigenous languages and the urgent need to preserve, revitalize and promote Indigenous languages and to take urgent steps at the national and international levels.
- Stimulate intercultural debate, including political debates and within academic circles, regarding Indigenous languages.
- Impart new knowledge on the importance of Indigenous languages.
- Shape positive attitudes of all stakeholders about Indigenous languages and their importance for peace, development and reconciliation.
- Engage Indigenous language users (speakers and signers) and inspire a new generation of language champions by:
    i. increasing the number of languages used online;
    ii. connecting language champions, keepers, and practitioners from different cultures;
    iii. increasing the number of language resources shared online; and
    iv. providing actionable templates for staging locally oriented events.
- Connect, mobilize, and encourage international cooperation among different stakeholders for new partnerships and sponsorships for the realization of a long-term response.

Perhaps where this toolkit finds its greater correspondence with the tasks laid out by the Global Communication Strategy is in engaging Indigenous language users (speakers and signers) and inspiring a new generation of language champions. To this end, the toolkit has already been used as a template to organize training workshops that bring together emerging Indigenous language defenders and promoters from different regions. Each of these workshops were led by peer facilitators, each of whom are Indigenous language digital practitioners from those same regions.

How will this toolkit incorporate new developments?

As it has been highlighted several times, this toolkit is but the beginning in the process of documentation, systematization and analysis of the rich universe of digital forms of engagement in favour of Indigenous languages. Consequently, it is possible that the current organization into key approaches, for heuristic purposes, of these vast engagement fields will grow (for instance, with the addition of a **Sustaining** approach) or change. As the International Decade begins and unfolds, more challenges as well as solutions to the preservation, revitalization and promotion of Indigenous languages, on- and offline, will become apparent.

This means that this instrument will become a dynamic and receptive platform for new information. It is the hope of the author and coordinator of the work that this toolkit will be appropriated, used and recycled by stakeholders of the International Decade of Indigenous Languages, Rising Voices partners and Indigenous digital practitioner networks. Only through greater accessibility and circulation will it contribute to protecting the unique value and global significance of Indigenous languages and their speakers/signers.

CHAPTER

8

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CHAPTER

9 Glossary

Glossary

Accessibility: It 'refers to how available a tool is to a broad audience. This includes making technology available to users with slow or no internet connections, people with a visible or invisible disability, and those for whom English is not a first language' (from 'Check before you tech', FPCC, 2020).

add-on: Also known as an extension, it is software that is installed in a main program to add new features and improve its performance.

American Standard Code for Information Interchange (ASCII): It is a standard for encoding characters in electronic communication. It provides a way to represent text in computers, telecommunications devices, and similar equipment. It had a total of 128 code points when it was first developed due to the technological constraints of computer systems back then. Out of these, only 95 were printable characters, which greatly restricted its capabilities to represent different scripts and languages. To overcome this limitation, many computer systems now utilize Unicode. (Based on Wikipedia)

Application Program Interfaces (API): It "is a set of defined rules that enable different applications to communicate with each other. It acts as an intermediary layer that processes data transfers between systems [...] A simple way to understand how APIs work is to look at a common example—third-party payment processing. When a user purchases a product on an ecommerce site, they may be prompted to 'Pay with Paypal' or another type of third-party system. This function relies on APIs to make the connection." (Taken from IBM.com)

Artificial Intelligence (AI): It refers to the simulation of human intelligence in machines that are programmed to think, reason, and learn. It involves developing computer systems that can perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and problem-solving. AI algorithms analyze vast amounts of data, recognize patterns, and make predictions or take actions based on the acquired knowledge, allowing machines to mimic intelligent behavior and adapt to changing circumstances.

automated speech recognition: it "is the technology that allows human beings to use their voices to speak with a computer interface in a way that, in its most sophisticated variations, resembles normal human conversation." (From UsabilityGeek.com)

automated text: Text generated or produced by a computer program or system without direct human input, often using artificial intelligence or natural language processing techniques.

DISCLAIMER: Several definitions in this glossary were created with the assistance of Generative Artificial Intelligence (GenAI). All of them have been reviewed and corrected for appropriateness and accuracy.

back-end infrastructure: The underlying technological components and systems that support and manage the functionality, databases, and operations of a software application or website, usually not directly visible to users.

Chapoltepek: This is the Indigenous Nahua name of the place where the Los Pinos Declaration was signed in 2019. The Los Pinos Cultural Complex is located within the Chapultepec Forest, which is currently an urban park located in the heart of Mexico City, and its existence dates back three thousand years. The place name of Chapultepec comes from the Mexikatlahtolli (Nahuatl) language, from chupul(in) 'grasshopper'; and, tepe(tl), 'mountain, hill'. It translates as 'at the grasshopper's hill'.

Centrality of Indigenous Peoples: This corresponds with the principle of self-determination, specifically, 'the right to use, develop, revitalize, and transmit languages orally and in written forms to future generations which reflect the insights and values of Indigenous peoples, their identities and traditional knowledge systems and cultures; the equal treatment of Indigenous languages with respect to other languages; and the effective and inclusive participation of Indigenous peoples in consultation, planning and implementation of processes based on their free, prior and informed consent right from the start of any development initiative as well as the recognition of the specific barriers and challenges faced by Indigenous women, whose identity, cultural traditions and forms of social organization enhance and strengthen the communities in which they live.' (UNESCO, 2020: 4).

Content Management Systems (CSM): Software that helps create, organize, and manage digital content on websites without requiring advanced technical skills.

Creative Commons: A licensing system that allows creators to share their work while specifying how others can use, modify, and distribute it, promoting a more flexible approach to copyright.

creole language: it is a stable natural language that arises when various languages blend and simplify into a new form, which eventually grows and evolves into a fully developed language spoken natively by a community in a relatively short period.

crowd-funding: A method of raising funds for a project or venture by gathering small contributions from a large number of people, typically through online platforms.

crowd-sourcing, crowd-sourced: Obtaining ideas, services, or information from a large group of people, often online, to accomplish a task or solve a problem.

cultural (mis)appropriation: The adoption or use of elements from another culture, often without proper understanding or respect, which can be seen as disrespectful or exploitative.

desktop app: A software application designed to run on desktop computers or laptops, as opposed to web-based or **mobile applications***.

diacritical writing: A writing system that includes diacritical marks, such as accents or symbols, to indicate specific phonetic or tonal qualities in the language.

digital literacy: The ability to use digital technologies effectively and critically to find, evaluate, create, and communicate information in various formats.

digital repatriation: The process of returning digital cultural heritage materials, like artifacts, documents, or recordings, to their communities of origin or cultural institutions through digital means.

digitization, digitize, digitalizing: The process of converting analog information, such as text, images, or sound, into digital formats that can be stored, processed, and transmitted using electronic devices and computers.

doxing (also doxxing): "the action of finding or publishing private information about someone on the internet without their permission, especially in a way that reveals their name, address, etc." (Cambridge Dictionary Online).

edit-a-thons: These are organized events where individuals come together to collaboratively edit and improve content on platforms like Wikipedia, typically focusing on specific topics or areas of knowledge.

edutainers: These are educators or performers who combine elements of entertainment (e.g., music, humor, interactive activities) with educational content to engage and inspire their audience in learning.

elicitation: It is a research technique used by linguists and language researchers to gather language data by prompting speakers to provide specific linguistic examples or information, such as words, phrases, or grammatical structures.

experimental data: It refers to the information collected through controlled experiments or studies to investigate various aspects of language, such as syntax, semantics, phonetics, or language acquisition.

free and open-source software (FOSS): It refers to computer software that is both freely available for use and allows access to its source code, enabling users to view, modify, and distribute the software under specific licenses.

gamification, gamified: It refers to the integration of game-like elements, such as points, badges, and challenges, into non-game contexts (e.g., education or marketing) to enhance engagement, motivation, and user participation.

GSM radio access: GSM stands for Global System for Mobile communications. It refers to the technology that enables mobile devices to communicate with cellular networks and access voice and data services in the GSM standard, which is widely used for mobile communication globally.

hackatons: these are intensive events where programmers, designers, and enthusiasts collaborate to create innovative solutions or software projects within a limited timeframe, often with a specific theme or challenge.

incubator phase: it is a testing ground within Wikipedia (or other platform, like Firefox) where new language editions or articles can be developed and refined before being officially launched on the main site.

Indigenous Data Sovereignty (IDS): It refers to the right of Indigenous communities to control, manage, and govern data related to their cultural heritage, knowledge, and resources, respecting their cultural protocols and values.

Indigenous languages: They are languages that originate from and are spoken by Indigenous nations, peoples, and communities, representing their unique cultural identities and heritage.

Indigenous protocols: They are a set of guidelines and customs specific to Indigenous communities, governing appropriate behavior, interactions, and usage of cultural knowledge, often involving permission, respect, and reciprocity.

influencers (social media): These are individuals who have gained a significant following on platforms like Instagram, YouTube, or TikTok, and can influence their audience's opinions, purchasing decisions, and lifestyle choices.

intellectual property (IP): it refers to creations of the mind, such as inventions, literary and artistic works, symbols, names, and images, used in commerce. IP is often protected by copyright, patents, trademarks, or trade secrets to grant exclusive rights to creators and inventors.

internet radio: it is a digital service that streams audio content, including music, podcasts, and live broadcasts, over the internet, allowing users to access a wide range of content from around the world.

Internet Universality: This concept "summarizes UNESCO's updated positions in the digital age, pointing to the four fundamental R.O.A.M principles, according to which the Internet should be human Rights-based, Open, Accessible to all and nurtured by Multi-stakeholder participation." (From UNESCO, Internet Universality Indicators).

language corpus: it is a large and organized collection of written or spoken texts that serves as a valuable resource for studying and analyzing the linguistic features and patterns of a specific language.

language documentation: it is the process of recording and preserving a language's grammar, vocabulary, and cultural knowledge through audio, video, or written materials, to safeguard endangered or under-documented languages.

language endangerment: 'A language is in danger when its speakers cease to use it, use it in an increasingly reduced number of communicative domains, and cease to pass it on from one generation to the next.' (UNESCO, 2003b: 2)

language nests: these are immersive early childhood education programs where young children are exposed to and learn a specific Indigenous or endangered language through play, storytelling, and everyday activities.

language processing: see, **natural language processing***.

language reclamation: it is defined as a 'larger effort by a community to claim its right to speak a language and to set associated goals in response to community needs and perspectives' (Leonard, 2012).

leaderboard functions: these are features in games, competitions, or platforms that display rankings of participants based on their performance or achievements, promoting competitiveness and motivation.

lexemes: they are basic units of language representing individual words or word forms that carry distinct meanings and can be used to build sentences and convey information.

lexical reclamation: it refers to the process of reclaiming or redefining derogatory terms or offensive language by marginalized communities, empowering them to redefine their own identities positively.

linguistic domain: it is a specific area or context in which language is used, such as formal or informal settings, technical jargon, or language used in specific professions or social groups.

linguistic landscapes: they are the visible and tangible presence of multiple languages in public spaces, including signs, advertisements, and official notices, reflecting the linguistic diversity of a community.

linguistic rights: these are the rights of individuals and communities to use, protect, and promote their languages without discrimination, ensuring access to education, government services, and cultural expression in their native languages.

live streaming: it is the real-time transmission of audio and video content over the internet, allowing viewers to watch events, performances, or broadcasts as they happen.

loanwords: these are words borrowed from one language and integrated into another language, often due to cultural exchange or historical interactions between communities.

local web servers: these are servers that run on a user's personal computer or a local network, enabling the hosting and testing of websites or web applications without being accessible to the broader internet.

localization: this is the process through which a product or a platform is adapted and translated, to make it usable in a particular country, or in this case, culturally and linguistically appropriate for speakers of a certain language.

localize: it means adapting or translating content, such as software, websites, or documents, to make it culturally and linguistically suitable for a specific target audience in a particular region or country.

machine translation: it is the automated process of translating text or speech from one language to another using computer algorithms, without human intervention.

mainstreaming (see, also **normalization***)**:** 'In the language planning paradigm, 'mainstreaming' refers to the appropriation by speakers of their own language and the universal acceptance of the use of the language as a matter of course. [...] Mainstreaming occurs at various levels: first, by increasing the number of opportunities to use Indigenous languages in private and public life—not only in academic institutions and public services in general but also in business and private life.' (From Terraza, Tipi and Daveluy, 2020, p. 10).

Media and Information Literacy (MIL): According to UNESCO, it "covers all competencies related to information literacy and media literacy that also include digital or technological literacy. It focuses on different and intersecting competencies to transform people's interaction with information and learning environments online and offline." (From UNESCO Institute for Information Technologies in Education).

memes: they are humorous or relatable images, videos, or phrases that spread rapidly through social media and online platforms, often conveying a shared idea or cultural reference.

memetic: it refers to anything that relates to or imitates the characteristics of a meme, such as using viral content to create humor or gain attention.

mesh networking: A mesh network is a system composed of multiple mesh nodes (commonly referred to as points, mesh extenders, or satellites). These nodes communicate with each other to share a wireless connection within a larger area.

minority languages: Their definition relies on two factors, a comparatively smaller number of speakers in their specific context, and the absence of official recognition. Consequently, languages such as Irish, which possess official status but are spoken by smaller subsets of the population, are not considered minority languages. Furthermore, this classification does not encompass dialects of the official language(s) of a country or languages spoken by migrants. (Based on the text of the European Charter for Regional or Minority Languages, 1992)

minoritization of, minoritized languages: These are those intentionally marginalized, disregarded or excluded despite being spoken by millions of people. For example, despite being spoken by more than 40 million people, Yorùbá is gradually becoming minoritized, for instance, in Nigeria where English or Pidgin English are the dominant languages. Minoritization of languages is associated with complex forms of linguistic displacement.

mobile application: commonly known as an app, it is software designed to run on smartphones, tablets, or other mobile devices, providing specific functionalities or services to users.

MOOC (Massive Open Online Course): it is an online educational course that is open to a large number of participants worldwide, typically offered by universities or educational platforms, and often free of charge.

multilingualism: it refers to the ability of individuals or communities to speak and understand multiple languages, promoting cultural diversity and facilitating communication across different linguistic groups.

multimodality, multimodal: it refers to the use of multiple modes of communication, such as text, images, audio, and video, to convey information and meaning, enriching the overall message and enhancing understanding.

Natural Language Processing: "[...] a branch of artificial intelligence that helps computers understand, interpret and manipulate human language. NLP draws from many disciplines, including computer science and computational linguistics [...]". NLP "helps computers communicate with humans in their own language and scales other language-related tasks. For example, NLP makes it possible for computers to read text, hear speech, interpret it, measure sentiment and determine which parts are important." (From SAS.com)

Natural Learning Processing: see, **Natural Language Processing***.

neologism: it is a newly created word or expression that may be coined to represent new concepts, adapt to modern trends, or fill a linguistic gap.

normalization (linguistic): it is the process of establishing a standard or consistent form of a language, particularly in spelling, grammar, and vocabulary, to ensure clarity and mutual understanding among speakers.

normalize: it means to make something conform to a standard or a normalized state, often used to bring consistency or regularity.

normalized: it refers to something that has been adjusted or standardized to a common or accepted norm.

obsolescence (technological): this occurs when a device, software, or technology becomes outdated or no longer relevant due to advances in newer technologies.

offline format: it refers to content or data that is accessible and usable without an internet connection.

online curation: it involves the selection, organization, and presentation of digital content, such as articles, images, or videos, to create meaningful collections or displays for online audiences.

online persona(e): it is the digital identity or representation of an individual or entity on the internet, often shaped by their activities, interactions, and content shared online.

Open Access: it refers to the practice of providing unrestricted and free access to scholarly research, educational resources, or creative works on the internet, enabling widespread dissemination of knowledge.

open source: it refers to software or projects whose source code is openly available and can be freely viewed, modified, and distributed by anyone.

OpenType Font (OTF): it is a type of digital font format that supports advanced typographic features and is widely used in modern desktop publishing.

performance: it refers to an act, display, or presentation of artistic, theatrical, or musical skills or abilities, often before an audience.

PHP: it is a server-side scripting language commonly used for web development to create dynamic and interactive web pages.

plug-in: it is a software component that adds specific features or functionality to a larger software application, typically enhancing its capabilities.

proprietary software: it is privately owned software that is not freely distributed, and its source code is restricted from being accessed or modified by users.

radio spectrum: it is the range of electromagnetic frequencies used for wireless communication, including radio waves used for broadcasting and wireless data transmission.

radio wave broadcasting: it is the transmission of audio or data content using radio waves, allowing the widespread distribution of radio programs and information.

Raspberry-pi: it is a credit card-sized single-board computer designed for educational purposes and DIY projects.

repository: it is a centralized location or database where digital content, data, or software is stored and managed for easy access and version control.

Rights of Indigenous Peoples: these refer to the collective and individual prerogatives and protections that recognize the unique cultural, historical, and territorial rights of indigenous communities, ensuring their self-determination, preservation of traditions, and participation in decision-making processes. The UN Declaration of 2007 "establishes a universal framework of minimum standards for the survival, dignity and well-being of the Indigenous Peoples of the world" (From UN, Department of Economic and Social Affairs).

secure messaging: it involves the use of encryption and other security measures to protect the confidentiality and privacy of messages sent over digital communication platforms.

server (internet): it is a computer system or software that hosts websites, applications, or data accessible over the internet.

signers, language signers: these are individuals proficient in sign languages, using hand gestures and facial expressions to communicate with the Deaf community.

spaced repetition (software, algorithm): this is a learning tool that optimizes memory retention by presenting information at spaced intervals to reinforce learning.

spectrum rights: they refer to the legal permissions or licenses granted to individuals or entities to use specific frequencies within the radio spectrum for communication purposes.

speech processing: it involves the analysis, recognition, and synthesis of human speech using digital signal processing techniques.

standardization, standardize: it is the establishment of a formalized and consistent set of rules and conventions to create a standardized version of a language.

strings (of code): these are sequences of characters, symbols, or commands used in programming and software development to perform specific functions or operations.

tactic: a simple definition of tactic is 'a planned method', or 'specific action' 'for achieving a particular result'. Rather than being deliberately orchestrated, tactical choice involves 'a process of gathering, interpreting, and evaluating information within dynamic, uncertain, and often-contradictory contexts' (Larson, 2013: 867). Here it is also understood as a discernible and specific activity, approach or path that contributes to the long-term goal of language reclamation, strengthening or revitalization.

technology: it 'refers to any tool that provides a service to users in order to achieve a goal. It includes web-based applications, desktop and mobile applications, cloud services, language learning games and hardware devices' (from 'Check before you tech', by FPCC, 2020)

Text-To-Speech (TTS): it is a technology that converts written text into spoken audio, enabling computers or devices to read aloud digital content.

tweeters: they are individuals who use the social media platform Twitter to post short messages, known as tweets, to share opinions, information, or updates with their followers.

typefaces: also known as fonts, they refer to the visual design and style of characters (letters, numbers, symbols) used in written or printed communication.

under-resourced languages: These are languages with one or all of the following characteristics: 'lack of a unique writing system or stable orthography, limited presence on the web, lack of linguistic expertise, lack of electronic resources for speech and language processing, such as monolingual corpora, bilingual electronic dictionaries, transcribed speech data, pronunciation dictionaries, vocabulary lists, etc.'. They are also known as 'low-density languages', 'resource-poor languages', 'low-data languages', or 'less-resourced languages' (Besacier et.al., 2014: 87).

Unicode (standard): A universal character encoding standard that assigns unique codes to characters from virtually all writing systems and symbols, enabling consistent representation and exchange of text across different platforms and languages.

Usability: It 'refers to how easy the technology is for its users. Technologies with poor usability are challenging for new users or require users to become 'experts' prior to using the tool' (from 'Check before you tech', by FPCC, 2020).

voice recognition: it is a technology that converts spoken words or phrases into text or commands, allowing users to interact with devices or applications using their voice.

CHAPTER

10

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UNESCO Regional/Field Offices & National Commissions

- Canadian Commission for UNESCO, Ottawa, Canada

Public Institutions

- Instituto Nacional de Lenguas Indígenas (INALI), Mexico
- Peruvian Ministry of Culture (Dirección de Lenguas Indígenas), Peru

Global

- Cultural Survival
- Endangered Languages Archive
- Endangered Languages Project
- Linguapax International, Barcelona, Cataluña (España)
- Living Tongues Institute for Endangered Languages, United States
- Wikitongues

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- Biblioteca de Investigación Juan de Córdova, Oaxaca, Mexico
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Digital initiatives for Indigenous languages

Committed to protecting and promoting Indigenous languages, this toolkit provides context, analysis, inspiration, and resources for your digital projects. It is the result of a dynamic collaboration with global networks of Indigenous language champions as part of the **International Decade of Indigenous Languages (2022-2032).**

Explore eight key approaches, access guides and tutorials, and be inspired by impactful language projects from around the world. Best of all, this toolkit is an Open Educational Resource, ready to evolve with changing needs and technology.

Preserve, revitalize, and celebrate Indigenous languages in the digital age with us!

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