

Endangered languages, technology and learning: A Yakama/Yakima Sahaptin case study

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**Abstract**

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Efforts to support Indigenous and endangered language education continue to utilize technology in a variety of ways. As the vitality of many languages around the world continues to be threatened, it is important to reassess previous developments in order to make better decisions with limited resources. Based on an audit of technological resources developed for North American Indigenous languages, I propose a series of questions that should be asked prior to future investment in any developmental effort. This dissertation is focused on a case study related to these questions. The case study concerns the digital archiving of learning materials for Yakama/Yakima Sahaptin (Ichishkíin Sínwit) and the process of leveraging these resources for the development of online learning content. A needs analysis was conducted for the Yakama language community as a means of providing further community oversight of the projects. The case study serves as a possible template for communities looking for a low cost system that is pedagogically flexible. A key issue that is highlighted throughout this dissertation is balancing security and access for communities who may wish to prevent out-group (e.g., non-citizens) access.

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## 1. INTRODUCTION

This dissertation investigates the challenges involved when utilizing technology to support endangered language learning. Specific attention is given to North American Indigenous<sup>1</sup> languages, which have special concerns and limitations that require creative solutions. One of the primary goals of this project is to emphasize the need to maximize the pedagogical potential of technological solutions by utilizing core language learning and acquisition research. Another goal is to prioritize solutions which would put a minimal resource burden on a language community.

Past and existing attempts to use technology for similar purposes were reviewed and based on the findings I put forward some proposals to guide future development (Ch. 4). A case study was undertaken to test these proposals and learn more about current challenges and possibilities. The core of the study involved an archiving project for learning materials developed to teach the Yakama<sup>2</sup> dialect of Sahaptin, a language from the Eastern half of Washington state, and associated with the Yakama Nation. The materials were developed primarily by Dr. Virginia Beavert, who is a Yakama elder, native (L1) Yakama speaker and Yakama language instructor, for use in her classes at Heritage University in the 1990s and early 2000s (§5.4.1). The materials are particularly valuable for teaching and revitalization efforts as they were created by a native speaker, something that is becoming increasingly rare. There is also a substantial amount of

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<sup>1</sup> “Indigenous” is the term used throughout this dissertation to describe any language historically spoken by citizens of Indigenous Nations that resided within the current boundaries of North America. Similar terms, such as native, aboriginal or tribal language, have additional interpretations that may add unnecessary confusion or controversy. I do not wish to make a claim that “Indigenous” is without controversy, nor that it should be the default term used for these languages whether in academia or the public sphere, but lacking an agreed upon standard it best serves the descriptive needs of this dissertation. This topic will be briefly revisited in section 2.1.

<sup>2</sup> Throughout this dissertation, “Yakama” (with an “a”) is used to describe the dialect as well as the Nation and its citizens (as it is the official spelling of the nation), while “Yakima” (with an “i”) is used primarily as the name of the city or county, and “Sahaptin” is used to refer to the language. This decision was made in order to help clarify referents in the text. This is not a statement in favor of a particular variant. Please see Rigsby (2009a) for a very thorough etymological study of “Sahaptin” in addition to a brief description of “Ichishkíin”, and Rigsby (2009b) for a similar review of the terms “Yakama” and “Yakima”. Personal communication with activists and researchers hint that “Ichishkíin Síwít”, one of the names of the language in the language, is more appropriate for in-group Indigenous peoples to use. As I am not Indigenous, nor a citizen of the Yakama Nation, I decided to limit the use of the traditional name in this dissertation and utilize *Yakama* and *Sahaptin* instead.

accompanying audio for the written content. Because the period over which the materials were created spans more than a decade of time, the materials also provide a window into the activities and development of an Indigenous language teaching program during that period. This project carefully examined the process of preparing materials like these for long-term digital archiving while maximizing accessibility for the language community and establishing necessary security systems for potentially sensitive content. After the archiving process was complete and the archive developed (Ch. 5), the materials were used to develop a sample online course module (Ch. 7) that tries to account for the necessary pedagogical, linguistic and resource demands. Both the archive and sample course were intended to test the feasibility of such projects for other endangered language communities with similarly limited resources.

Part one of this dissertation serves to provide some context for the various technological developments intended to support endangered language revitalization and education. Chapter 2 is concerned with the broader situation facing Indigenous languages in North America, with a review of key endangered language concepts such as language shift and extinction (§2.1 & §2.3). Then, the issue of ethnolinguistic vitality (Giles, Bourhis, & Taylor, 1997) is explored with respect to language policy and other factors that may influence Indigenous language communities (§2.2). Chapter 2 closes with a discussion of the intersection of language, culture, identity and globalism (§2.3)

With that background in place, a more localized context is provided in Chapter 3 in order to better illustrate the need for the projects described in this dissertation. It presents a concise summary of a study that examined Indigenous language educators and described existing K-12 Indigenous language programs in Washington state. The results of this study provided the initial impetus for this dissertation and also helped guide and inspire a series of proposals made for developing technological resources for endangered language learning. Chapter 4 introduces these proposals and their supporting arguments, and then applies them to a brief case comparison of existing language materials for Dakelh and Korean.

After the larger context is established, part two of the dissertation focuses on the case study and the projects undertaken to support Yakama language education. Chapter 5 is the core of this dissertation and describes the creation of the Beavert-James Heritage course archive. The chapter begins with a brief review of the Yakama language (§5.2) along with key demographic and political information (§5.3). Next, I provide some history of the materials prior to their donation to Prof. Sharon Hargus of the University of Washington (§5.4.1). The remainder of the chapter is divided along three primary topics: the initial curation and processing of the materials (§5.4), ethical and security concerns (§5.5), and the development of the online archive (§5.6).

Building on the findings of the earlier studies on Indigenous language education in Washington State (Ch. 3), Chapter 6 presents a needs analysis of the Yakama language community concerning the archive and future online course content. Chapter 7 describes the process of developing an online course template for the Yakama language utilizing content from the archive. The online course template serves as a case study of the proposed model presented in Chapter 4, and specifically section 4.4.

Part three, with Chapter 8, brings the dissertation to a close with an assessment of the projects and a discussion of some possible directions this work may go in the future as well as persistent unresolved issues and questions.

## PART ONE: CONTEXT

### 2. NORTH AMERICAN INDIGENOUS LANGUAGE REVITALIZATION

It seems prudent to begin this chapter by addressing the question of why anyone should concern themselves with trying to improve the vitality of languages that are seemingly fated for extinction. Crawford (2000) presents the following argument:

*“Along with the accompanying loss of culture, language loss can destroy a sense of self-worth, limiting human potential and complicating efforts to solve other problems, such as poverty, family break down, school failure, and substance abuse. After all, language death does not happen in privileged communities. It happens to the dispossessed and the disempowered, peoples who most need their cultural resources to survive.” (Crawford, 2000: 63).<sup>3</sup>*

These issues Crawford describes are interconnected. Without sufficient financial and other practical resources (§2.2.2), the cultural foundations of a group can be further threatened.

This chapter provides background on the status of Indigenous languages in North America, with particular attention given to languages of the Pacific Northwest, in order to illustrate the overall picture of need<sup>4</sup> for these languages and associated communities. The main projects described in this dissertation, specifically the online course system (Ch.4 & Ch. 7) and Sahaptin language learning materials archive (Ch. 5), were developed to address these needs to varying degrees. This chapter uses the sociolinguistic literature as the primary frame of reference. To begin, section 2.1 contains a review of some relevant terminology and concepts, followed by section 2.2 with an introduction of the main frameworks underlying all of the studies (Ch. 3,

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<sup>3</sup> Crawford is framing the term ‘survive’ in a broad social justice context. While he doesn’t clarify, perhaps a reasonable soft interpretation of this could be related to ‘quality of life’, while a moderate one might be ‘to thrive’ and a strong interpretation would be ‘contrary to death, whether cultural, political or physical’. The concern about issues like poverty and substance abuse seem to support a stronger interpretation of the term.

<sup>4</sup> See subsection 7.2.2 for a further exploration of the term ‘need’.

Ch. 4, Ch. 6) described in this dissertation, and finally, section 2.3 touches on the related topics of culture and identity and how they relate to language, education and policy. Issues surrounding culture and identity are interwoven throughout the dissertation (§3.2, §4.2.4 & §8.2.1), and are a particularly dominant theme in the data from the needs analysis (NA) (§6.2.4 & §6.7.3.4).

## 2.1. MINORITY LANGUAGE EXTINCTION, SHIFT AND REVITALIZATION

When dealing with Indigenous languages there are often terms which are used in certain domains and fields of research (e.g., government, education policy, etc.) that require some exploration and unpacking. For example, some may classify Indigenous languages as “endangered”, “moribund”, “dead”, “less-commonly taught/spoken”, “minority”, “heritage” and the more recently adopted term, “world” languages (§3.2). Because of its common usage in policy documents and literature that is of particular interest to this project, this section focuses on the term “minority language”, which may be interpreted in a variety of ways. In order to be consistent throughout the following sections, a clear definition of how it is used in this chapter is needed. The Council of Europe in their *European Charter for Regional or Minority Languages* defines a minority language as one which meets the following criteria:

*“(A language that is) ...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 different from the official language(s) of that State;”*  
*(European Charter for Regional or Minority Languages, 1992)*

Certainly in 2016 all Indigenous languages in North America would be classed as minority languages under this definition, which for the purposes of this project, suits the languages in question fairly well. This would also apply to the language that is the focus of the case study described by this dissertation, Yakama<sup>5</sup> (§5.2). As another example, Lushootseed<sup>6</sup>, a language spoken predominately around the Puget Sound in Washington State, has recent

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<sup>5</sup> ISO 639-3 code: yak

<sup>6</sup> ISO 639-3 code: lut

estimates with as few as ten L1 speakers (Watanabe and Sasama, 2007). Those low numbers easily meet the criteria outlined above. Lushootseed has been traditionally used in the Puget Sound area of State of Washington. The group of speakers is, and was in recent years, a small percentage of the majority language (English) speaking population. Finally, it is not an official language of the state.

In accordance with the definition above for minority languages, the current vitality of most Indigenous languages in the US does not engender much optimism (Lee & McLaughlin, 2001; Living Tongues, 2007). Of the original estimated 300 languages which existed prior to European contact in North America, only about 155 were believed to still be spoken in 1998 (Krauss, 1998). Krauss also states that of these 155 languages, 70% are only spoken by those in the grandparent generation or older, and claims that all Indigenous languages in the United States are severely endangered.<sup>7</sup> He predicted that by 2010 only 100 languages would still have any native speakers, and that by 2060 only 20 languages will still have L1 speakers. Hinton (1998) notes that of the 98 languages that were once spoken in California, almost none had any native speakers remaining at the time of publication. Even the languages that had speakers were not being used in daily communication. This form and rate of extinction does not have historical precedence and is similar to cultural diversity loss as well (Crawford, 2000; FPHLCC, 2010; Hale, et al., 1992; Sachdev, 1995). With similar statistics here in Washington State the outlook for Indigenous languages is bleak, but there are some schools (§3.1) and individuals working hard to provide the next generations with access to these languages (e.g., The Makah Language Program, the Tulalip Language Program, Northwest Indian College, Heritage University). In addition, a few programs in other states have shown progress (Johnson, 2010) and even moderate success (McCarty, 1998).

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<sup>7</sup> A 1992 article by Krauss reported that 80% of the 300 North American Indigenous languages were believed to be moribund at that time (Hale, et al., 1992).

In the U.S., with its large monoglot population, there are a few other ways to define non-English languages which are tied to the home or non-dominant culture. A term that was much more commonly used in the past is ‘mother tongue’. This was often used to describe a language that was spoken at home by one’s family, but not in the primary domains of society. Particularly related to Indigenous languages is the label ‘heritage language’. It implies a strong link to culture and the family. Not all contexts and uses of the term ‘heritage language’ are a concern (e.g., Kagan, 2011), but García (2005) argues that the term ‘heritage language’ is largely a replacement for previous elements related to ‘bilingualism’, a hypothetical situation where an L2 and English could be more-or-less balanced.<sup>8</sup> Instead, García suggests that the term can position the minority language in direct opposition to English, such that it is a language of the past, not modernity and science. It is a language that is taught for traditional or cultural reasons, but is not relevant for modern communication. It is often the case with more commonly-taught languages (e.g., Spanish) that ‘heritage’ more often modifies the noun ‘learner’ and not ‘language’, and as such is less problematic. Similar to the term ‘heritage’ is the label ‘aboriginal’ which may be used to convey precedence, but may also carry associations of non-modernity as well (Perley, 2006).

Rampton (2003) explores the idea of a ‘native speaker’ and the implications of that label, especially with regards to language learning, when it is often used without any connection to L1 acquisition research (e.g., Herschensohn, 2007). How is a native speaker defined in opposition to a ‘fluent’ speaker or expert in the language? He proposes two factors for clarifying the terminology: inheritance (through one’s family line) and affiliation (or language loyalty). Both are negotiated, but inheritance operates within social boundaries, while affiliation operates across them, as will be seen with Sahaptin (§6.7.3.2 & §6.7.3.4). Rampton also questions the usage of

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<sup>8</sup> By more-or-less, I am referring to the hypothetical question of whether an individual can be equally proficient in two languages. Arguably, individuals have varying degrees of proficiency in their L1, L2, etc and even among multiple L1s, even if it’s simply at the level of the lexicon. The issue being raised here is the definition of bilingual in the educational or heritage language community contexts. At what point does an individual’s L2 proficiency mean that they are ‘bilingual’? L1-like proficiency in a L2 is one clear diagnostic, but that is not necessarily how the term is used by educators, policy makers and parents. Would an individual ranked as ‘intermediate mid’ by ACTFL in an L2 classify as being bilingual? (ACTFL, 2012) The argument that is being made here is that the fluency goals implied by ‘bilingual’ education in an educational context are higher than those for ‘heritage’ language education.

‘native’ speaker, especially as a comparison for L2 learners, because the level of expertise and linguistic competence native speakers can have varies, especially in endangered language situations. In addition, ‘nativeness’ is not likely the actual goal of a language learner, while expertise is. Rampton admits that these concepts are not without complications, but they do clarify some of the problems and make the cultural and social information carried by the terms more apparent.

The process of ‘language shift’ has had a substantial effect throughout North America, particularly for Indigenous languages. Language shift can be the result of a minority language-speaking group, as small as a family to much larger communities and groups, residing in a context where a different language has dominant status (Fishman, 1991). In the context of heritage language learners in the United States, Tse (2001) describes language shift as the gradual lack of retention of the heritage language by subsequent generations until it is essentially no longer adopted. The process of language shift can take place over as little as one lifetime but it is generally thought to be a multi-generational process (Lam, 2009; Tse, 2001). The end result of this shift may be language death (Crawford, 2000). Reversing language shift from the majority language (in this case, English) to the traditional language can be an extremely difficult and complicated process (House, 2002), but an understanding of factors behind language shift may help improve the methodology used in language revitalization and maintenance programs (Fishman, 2001). Language shift and efforts to reverse it will be discussed further in section 2.3.1. with respect to globalization and top-down control.

The following is a difficult question that needs to be raised before continuing: Is developing a stable bilingual situation or diglossia in the U.S. with an Indigenous language a realistic goal? Crawford (1996) argues that it is unlikely but the odds of maintaining a stable diglossia “decline to the extent that traditional cultures decline, thereby shrinking the domains of the ancestral tongue.” (28) On the one hand it is a noble goal for those working to improve the health of endangered languages, but as Parkin argues below, it is important that the goal be

considered pragmatically and that it does not negatively affect factors such as morale, and prevent the development of effective resources that might not be perceived as meeting a hypothetical ‘gold standard’ of the language.

*“...language viewed as a commodity may be ‘produced’ in schools according to formal government programmes and yet may also flourish independently of such factors, as if self-determining. I suggest that this is the same tension implicit in the metaphor of global socio-cultural ‘creolization’, which blends the idea of fragments of supposedly autonomous or specialized knowledge with that of a universal interconnectedness of knowledge. I further suggest that this obliges us to reconsider the linguistic concept of diglossia as concerned not with discrete diatypes but as **resting on the idea of unattainable linguistic desire.**”* (emphasis mine) (Parkin, 1994: 229)

Therefore, in order to maintain the necessary motivation that a program requires to accomplish nearly any goal, there must be a clear understanding of the needs of a community (§6.2.1), the needs of a language program (§2.2.2, §3.3 & §6.7.2), the goals of a language program (§3.2 & §4.2.1), and the realistic linguistic potential of any efforts (§4.2.3).

## 2.2. ETHNOLINGUISTIC VITALITY AND REVITALIZATION

Giles, Bourhis, & Taylor define ethnolinguistic vitality as “that which makes a group likely to behave as a distinctive and active collective entity in intergroup situations” (1977: 308). It is important to note that “vitality is not static, but rather a malleable social construction that is affected by social group membership, context, and sociopolitical circumstances.” (Abrams, Barker, & Giles, 2009: 60) Thus, a group with no vitality is essentially no longer a distinct group. Following this model, the study described in Chapter 3 was more interested in subjective perceptions of vitality, as opposed to objective. These subjective perceptions can have an effect on the vitality of minority languages with regards to maintenance and loss (e.g., Abrams, et al., 2009). Building on this, Giles et al. (1977) present three variables which can influence the

ethnolinguistic vitality of a language. The first is demography (§5.2 & §5.2). The second is status, which includes economics. The term *economics* is used here to refer to the perceived economic value and utility the language has. The third, institutional support, refers to the influence of entities and domains such as the government and media, as well as use of the language therein. Institutional support is a particularly complicated issue for Sahaptin, and will be revisited later (§6.7.3.4). These variables are not believed to be the only categories related to linguistic vitality, nor are they necessarily rigidly defined. Regardless, they are a useful metric for vitality research and project development. In this section, the latter two categories will be explored and related to the current situation for Indigenous languages in Washington, including Yakama, the subject of the case studies undertaken for this dissertation.

#### 2.2.1. *Status and economics*

The status variable encompasses factors related to prestige for a speech community (linguistic in-group), some in relation to other speech communities (out-groups). Kraemer, Olshtain, & Badier (1994) suggest that (subjective) vitality perceptions may be linked to the status variable more than other variables. Links may exist between the perceived value of a language, its vitality and the vitality of its affiliated culture. Giles et al. (1977) provide four factors under the status variable: ascribed, sociohistorical, language, and economic status. Ascribed status is that which comes from the group itself, which is exemplified by the Sahaptin language community later in this dissertation (§6.7.1). If the in-group speech community sees themselves in a positive manner, the boosted morale can have a positive effect on vitality. Sociohistorical status is related to the historical salience of the language in question. If a language was the victim of official suppression, it can be used as a rallying point and promote solidarity. Alternatively, if there were positive events related to the language, those may promote the value and vitality of the language. The status of the language itself can vary within different groups. While a language may have a high or low value in an in-group speech community, which is investigated in chapter 3 and the needs analysis described in chapter 7, the opposite may often

be the case with the out groups where Indigenous languages have a low value.<sup>9</sup> For example, Makah may be highly prized by the local communities where it was traditionally spoken and is currently being taught, but the majority of North American residents may not place the same value on it. Out-group regard of an Indigenous language can affect in-group regard, as well as available resources, demand for educational programs, speaker populations and supportive domains (§8.2.3).

Economics are only one of the numerous challenges these minority linguistic communities face for maintaining their cultures and languages (as further discussed in §3.3 & will be seen for the Sahaptin community in §6.7.2). However, the economic status of a language is an important factor (Lam, 2009; Tse, 2001), one that can have strong effects on linguistic vitality (Landry, Allard, & Deveau, 2007). Most of the communities where minority languages exist or are associated with in Washington State are, to various degrees, surrounded and influenced by larger English-speaking and non-Indigenous US-cultured groups who may be perceived as the source of economic power.<sup>10</sup> Standard English is often held as a main route to prosperity by linguistic minority communities (García, 2009; Lee & McLaughlin, 2001). A lack of economic autonomy can be interpreted negatively for the economic status variable (Giles, et al., 1977). Some people in a community with a moribund or endangered traditional language may feel that the development of skills in Standard American English, with the economic benefits tied to it, is more important for the health of the community than the heritage language (Linn, Berardo, & Yamamoto, 1998; Spolsky, 1977). The economic power of English can also have an influence on the movement of individuals outside the community. If the speakers are unable to survive economically in the environment where their language is spoken, they are generally more likely to travel outside to the English-speaking community at large (Hinton, 1998). It could be argued that while any language revitalization efforts may be perceived as

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<sup>9</sup> See Hugo (2015) for a study on attitudes held by out-group members of a community that share schools with an Indigenous Nation in Washington regarding Indigenous language education.

<sup>10</sup> This is also the case with the Yakama Nation, which is described in section 5.2.

having value, in order for it to have long term effects or become self-perpetuating, fluency for both children and adults is vital (Fishman, 2001). This is made more difficult when there isn't a stable environment and a population where a speech community can thrive. Even at a purely educational level, a population that is spread out geographically limits access to language classes (§3.1 & §4.4.1). This is also the case for Sahaptin language education, as will be seen in §5.3 & §6.7.3.5. Bourhis (1982) notes that a high birth rate, loyalty to Catholicism and economic autonomy all played a role in the maintenance of French in Quebec. In the end, to weaken the negative effects of economics on language revitalization there should be new roles for the Indigenous language in the local economic system, more support for bilingualism within and without the community, and more economic opportunity in general in the local community.

#### 2.2.2. *Institutional support*

This subsection deals with institutional support for language revitalization programs. Institutional support is the third variable influencing ethnolinguistic vitality suggested by Giles et al. (1977). Under this model, institutional support is divided into two subgroup pairings: formal vs. informal support, and influence vs. representation. Formal support is that which exists in an official capacity from the “top-down”, such as the state government. Legislation on minority language education would fall under this category (§3.1). Informal support operates from the “bottom-up” or pressure and activism from local and community-based groups. Examples of informal support from Sahaptin language educators and activists will be seen in §6.2.5 & §6.7.1. Here, influence is used to describe the effectiveness of a group, whether related to formal or informal support, to change the amount and type of support in some manner or another. For example, a community-based (informal) language activism group arguing for legislation on behalf of the minority language may have a different level of influence than that of a larger state-wide organization. Representation related to institutional support refers to the domains where the language is used and to what degree. If a language is used in a school or in an official government document, it has formal representational institutional support. The more robust the

positive formal and informal representation the language has, the more the vitality of the language is supported (Giles, et al., 1977). The model developed by Giles et al. (1977) used above is oriented more for language use and perceptions and not specifically issues of education or revitalization. Because of this, the model has been slightly modified for the purposes of this dissertation to include resources under institutional support.

In the remainder of this section, an introduction to resources will be presented and how they relate to the concerns of language education and vitality. The issues surrounding financial<sup>11</sup> resources, as well as some possible negative effects due to support from dominant out-groups, will be presented in subsection 2.2.2.1. Next, in subsection 2.2.2.2, there will be a brief overview of material resources, their importance and the challenges that often come when trying to acquire them. Finally, human resources will be discussed in subsection 2.2.2.3, particularly native speakers and trained instructors.

#### 2.2.2.1. *Financial resources*

Financial resources can come from either the community, school budget, or state and federal funding (e.g., grants). Past research and the apparent costs of modern public education uphold the idea that money is necessary to both initiate and then maintain a language program (FPHLCC, 2010; Govig, 1999). Financial support from the US Federal government for Indigenous language education has been intermittent in the more recent past (i.e., 1960-80s) (Spolsky, 1977), although funding did become more accessible throughout the 1990s (Hinton, 1998). This lack of stability forced programs to cease or drastically reduce their scope, which in turn led to resentment and a lack of trust of the state and federal government to follow through on such programs (Fishman, 2001). This may have led some administrators, educators and community members to hesitate putting the effort and investment into a program if the funding could be pulled out in the near future. This lends support for the need to prepare paths for

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<sup>11</sup> In this dissertation, the term *financial* is used to refer to actual monetary resources and concepts. For example, *financial resources* could be the amount of money provided by a grant that an indigenous language program receives. *Financial* should not be confused with the term *economic*, which is defined in subsection 2.1.1.

development work to last beyond a single program (§4.2.6). These precarious politics and language support issues are a clear concern for the Yakama language community (§6.7.3.4). Putting this into perspective, during the previous century many federal and state policies were enacted with the purpose of eradicating Indigenous languages and culture (de Leon, 1997; House, 2002; Krauss, 1998, 2000; Sims, 1998). The more recent infrequent, and possibly token, support led to additional problems of trust and cooperation between Indigenous communities and the state and federal governments. Even if financial support from the government, external to the tribal nation, were stable and consistent, community-based support has its advantages. Dorian (1987) argues that economic independence can have a positive effect on language vitality as government financial support can be negatively perceived or restrictive. While state and federal governments may not be the most ideal sources of financial support for a language program (also see §2.3.1) they are nonetheless a vital source at this point.

#### 2.2.2.2. *Material resources*

Materials include anything that may exist to support language learning in and outside the classroom: textbooks, workbooks, handouts, audio recordings, video recordings, and/or software. These may have been created with pedagogical intention (e.g., workbooks) or not (e.g., literature).

The textbook can be considered a core material for non-immersion language education in general. Most modern world language<sup>12</sup> programs in public schools, as well as universities, utilize them to various degrees. The textbooks for these types of courses are generally of good quality, and for most languages there is a fairly broad range of options for an instructor to choose from. In some cases, handouts make take the place of, or supplement, a textbook, but it is also not uncommon for these handouts to be derived from an existing textbook. Crucially, textbooks

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<sup>12</sup> The Higher Education Coordinating Board (HECB) of Washington State defines a “World Language” as “[a]ny natural language that has been formally studied [...], including American Sign Language (AMESLAN, the language of the deaf community), and languages no longer spoken, such as Latin and ancient Greek.” The HECB groups Indigenous languages with foreign languages and American Sign Language (WAHECB, 2007).

are generally costly. Quality teaching materials can be both time consuming to develop and expensive to produce, but they are arguably beneficial (Kondo, 1997). Materials for minority languages often have additional costs due to a comparably smaller pool of existing research and linguistic resources to pull from. Also, since minority languages typically have smaller buying pools for materials than majority languages like Spanish or English, simple manufacturing costs will generally be much higher. A print run of 500 textbooks can be substantially more costly per item than a comparable book run of 10000 copies. Thankfully, new technology such as short run printers and assemblers, as well as digital and internet-based resources, has provided a more equal footing.<sup>13</sup>

It is also important to consider the time and specialization that is required for the development of materials. Additional complications arise in the creation of educational materials for Indigenous languages, which often have strong religious or cultural connections that require careful treatment when programs are constructed (Spolsky, 1977).<sup>14</sup> Beyond this, languages with underdeveloped or non-existent orthographical systems or those which lack resources to promote literacy will require even more resource support. Another concern is that some communities may not have had access to support from trained linguists for the production of accurate documentation and resource development while L1 speakers were alive (FPHLCC, 2010). Even if they do have core resources and analyses done by researchers, the development of pedagogical materials is a completely different time consuming and costly process (Newman, 1999; Wilkins, 1992). Textbooks, workbooks, audio recording, and even literature for children and young adults in the language in question can be an enormous undertaking depending on the scope, a topic that will be explored further later in this dissertation in chapter 4, which examines the complexities of developing digital language learning materials and chapter 5, which explores issues related to managing, storing and delivering materials.

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<sup>13</sup> This topic is revisited later as the focus of chapters 4 is on improving the efficiency and distribution of quality content and chapter 5 describes the creation of an archive of materials like the ones described here.

<sup>14</sup> Concerns related to potentially sensitive materials are explored further in §3.1.2, §6.2, §7.2.5 & §7.7.3.

### 2.2.2.3. *Human resources*

Human-based resources for language revitalization programs include qualified teachers and crucially, native (i.e., L1) speakers.

#### 2.2.2.3.1. *Native speakers*

Many Indigenous languages have no living native speakers. In such a case, the language is considered extinct<sup>15</sup>, while other languages which have very few native speakers may be considered *moribund* or *endangered*. An *endangered* language may also refer to one where some children are still being taught the language but it is not likely there are enough acquiring the language to sustain it much into the future (Hale, et al., 1992). In Washington State, most Indigenous languages fit into one of these categories, including Sahaptin (§5.2). Most of the native speakers that do exist are elderly. While this can be a benefit in that they may be retired and have more free time to participate in programs, with age comes potential health, financial and mobility restrictions.

Existing native speakers may inspire a more positive outlook, and with their overt valuing of the language they may influence the likelihood of a program being offered (§3.3). Evidence of this can be seen in the data from the needs analysis conducted for the Yakama language community who view the prominent native speaker and educator Virginia Beavert as one of their greatest assets and advocates for the language (§6.7.1). Native speakers are arguably the most valuable resource for any language program. They provide a vital source for authentic speech and communication practice. They can help with the development of materials, such as dictionaries and audio/video recordings (§4.2.5). Having a native speaker (and individual citizens on an Indigenous Nation affiliated with a language in question) has an added benefit of cultural authenticity and authority. Spolsky (1977) suggests that some students may under-perform in a formal setting as a form of “passive resistance” against the program for one reason or another.

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<sup>15</sup> ‘Endangered’, ‘moribund’ and ‘extinct’ are technical terms used in this dissertation to refer to the current and projected population of L1 speakers for a language. They are not used here with intention to devalue a language or discourage educational efforts.

Such a situation may be less likely to occur if the instructors and policy makers are members of the same community, or at least have visible support from the community. This is an argument that is supported by the data in the needs analysis conducted for the Sahaptin language community (§6.2.4 & §6.2.6). Clearly, native speakers of a language, if they are a part of the community, are probably the best example for conveying authentic identity ties and lending legitimacy to the program. Beyond this, they are also vital for authentic language practice and exposure, as well as a resource for the development of pedagogical materials. All of these arguments are supported by the example of Dr. Virginia Beavert, who is a Yakama elder and the creator of the majority of the language materials belonging to the Yakama Sahaptin language course archive that is at the center of this dissertation (Ch. 5).

#### 2.2.2.3.2. *Teachers and training*

In addition to native speakers, pedagogically trained instructors are a key resource for vitality improvement efforts. Beyond general and language pedagogical training and academic accreditation or certification, of crucial importance is familiarity with the language in question. A possible concern is that more officially regulated teaching positions may have standards which can limit the pool of potential candidates to such a degree that there may be no one available who is technically qualified (Crawford, 2000; §3.3). A lack of trained teachers is a clearly expressed need by the Sahaptin language community (§6.7.1 & §6.7.2). Teachers who are untrained, under-prepared, those with negative language attitudes (Purdie, Oliver, Collard, & Rochecouste, 2002) or generally unqualified can negatively affect the attitudes and success of students involved with a program (Dorian, 1987). Those who meet the requirements and are a part of the community are likely to be even rarer. Spolsky (1977) provides an example from the Navajo Nation in 1974 where, of the approximate 3000 teachers, only 200 were of Indigenous origin and roughly only 100 were fluent Navajo speakers. This was one tenth of the total estimated that were needed to do a basic transitional bilingual program. Spolsky argues that the educational standards required for teachers impeded the feasibility of a bilingual program getting off of the

ground. Although optional certification could be beneficial, such programs are not always available. For example, in British Columbia less than 30% of Indigenous languages have certification options available (FPHLCC, 2010). This is another reason why investigating other methods of delivery of instruction (e.g., online, hybrid, etc.) is particularly important for the foreseeable future (§4.4.1). The course module (Ch. 7) and archive (Ch. 5) developed for Sahaptin are an attempt to address this need (§5.6.3).

To summarize, the ethnolinguistic vitality model (Giles, et al., 1977) can help us to understand some of the unique challenges facing Indigenous language revitalization efforts. In the regional context that this dissertation is interested in (the Pacific Northwest), the status variable is particularly relevant. The perceived economic value of the language can have an effect on revitalization efforts, while the lack of actual economic integration of a language in and around a community hinders prestige and domain expansion (§6.2.7, §6.7.9.2). The clear lack of financial and material resources is a pressing issue, but arguably human resources are the greatest need for North American Indigenous languages (e.g., §3.4, §6.7.2, §6.7.9.4).

### 2.3. LANGUAGE, CULTURE AND IDENTITY

Language can be thought of as a fundamental part of an ethnic group's or individual's identity (Giles, et al., 1977; Sachdev, 1995; Tsunoda, 2005). Language is sometimes said to equal culture, or at least constitute a large part of it (§3.2, §4.2.4, §8.2.1). Similar sentiments were frequently expressed by members of the Sahaptin language community (§6.7.9.5), while the controversy and misunderstanding surrounding this topic will be revisited throughout the rest of the dissertation. For example, the question of identity and culture is particularly relevant to the issue of in-group and out-group access to the language (e.g., §6.7.3). In this section, I will discuss how language, culture and identity relate to Indigenous language revitalization and give a brief overview of the associated literature. To begin, Le Page & Tabouret-Keller (1985) build a definition for *identity* from two angles – the first which recognizes an individual's distinct

identity, which is separate from groups, and the second which accounts for membership in a group, or how the individual is identified with respect to various groups.

*“...it is essential to stress that groups or communities and the linguistic attributes of such groups have no existential locus other than in the minds of individuals...linguistic items are not just attributes of groups or communities, they are themselves the means by which individuals both identify themselves and identify with others; hence the existential locus of homo, be it individuals or groups, is in the language itself.” (Le Page & Tabouret-Keller, 1985: 4-5)*

The quote above highlights the subjective and fluid aspects of linguistic identity and how it can relate to stereotyping (Hewstone & Giles, 1986). While the identity of a group may continue after losing the language, the loss can have a substantial effect (Edwards, 1985). McCarty (2008) notes that Indigenous American languages have an especially strong tie to identity, one that is often referenced in discourses as being akin to a cornerstone of the history, culture and philosophy of a tribe. Because of this connection, she argues for a new definition for these languages, ‘Heritage Mother Tongues’ (§2.1). Even though the members of the community that identify with the language may not have a level of technical fluency typically associated with a common understanding of what a “mother tongue” is, in fact they may not have much knowledge of the language at all. Yet, it has a prominent place in other areas related to culture and identity.

In this section some examples will be presented of how languages have been used by dominant out-groups to identify a community and how the identity of a community and the individuals therein are influenced by the language. Building on this is the idea of the role the perception of the relationship between the languages and their speech communities by majority out-groups can play in a language’s vitality and associated identity. In other words, minority language speakers identify partly from the *perceived* subjective attitudes of those in the dominant majority group (Purdie, et al., 2002). Yet it is important to keep in mind that what the speaker perceives the dominant group’s beliefs are and what the dominant group actually believes may

differ. Positive self-esteem can support the vitality of a language via the status variable (§2.2.1), while negative self-esteem can negatively influence its vitality (Giles, et al., 1977). The subjective perceptions of a language's vitality and purpose by individual speakers can be complicated and yet an important part of the vitality picture (Coupland, Bishop, Williams, Evans, & Garrett, 2005).

Shared linguistic features (dialect or language) not only have an influence on the identities of the individual and community (Lam, 2009), but may also be regarded as a defining factor for the identity of a nation (Fishman, 1972; Lane, 2009). Historically, people outside of the community (e.g., missionaries, politicians and anthropologists) have used linguistic differences as a tool for establishing national identities (Gal & Irvine, 1995). As an example, after being subjugated by colonists, the Mojave Tribe used their language for defining their group identity in relation to the other (e.g., “whites” and “blacks”) (Gorman, 1981). These factors may also influence the sociohistorical status of a language and its ethnolinguistic vitality (Giles, et al., 1977). Giles et al. suggest that historical linguistic subjugation of ethnolinguistic groups as well as incidences of resilience may both be used to symbolically bolster the sociohistorical status of a language. These historical and present ties between the group and the language with respect to identity can have a positive influence on the vitality of the language.

The self-defined identities of those in the linguistic minority are also often subject to the opinions of the dominant out-group, in this case English speakers or the state government (Blackledge & Pavlenko, 2001; Hugo, 2015a). Under this model where the “negotiation of identities” is a mix of self-representation by the individual and the attempts of others to reposition them. For example, if a minority language speaker asserts a linguistic identity which differs from the dominant group identity, it may be challenged. The link between a language (or dialect) and identity of any entity may be fluid. A more succinct definition of this type of identity might be “...the social positioning of self and other” (Bucholtz & Hall, 2005: 586). This definition refers to an interaction, including between in-group or shared-ethnicity-based

networks. In particular, the term ‘language identity’ as used here is more concerned with interaction, particularly passive, related to the dominant out-group community. Yet, a group that a more dominant out-group perceives as homogenous (e.g., Lushootseed speakers), as individuals, may in fact not view themselves as homogenous or share the identity that they’ve been ascribed. An example of this is some of the complicated political and affiliation politics surrounding language education and access in the Sahaptin language community (§6.7.3.2). House (2002) cautions against taking a culturally homogenous view of modern Indigenous groups, as well as neglecting to recognize the multilingual traditions many of them had.

As discussed above, linguistic identity goes beyond the simple analog of language equals culture. While identity is an important issue, it is necessary to frame the related topics within broader political and cultural contexts. Because they relate to nearly every aspect of this dissertation, the roles which identity, language, culture and politics can play in minority language education contexts will be explored further in the following sections. Section 2.3.1 is concerned with the effects of globalization and politics on language revitalization and language shift reversal programs. Section 2.3.2 discusses cultural homogeneity and how English and the culture of the dominant out-group (English speakers) can affect the status and perspectives of Indigenous language and identity. Finally, Section 2.3.3 provides an overview on the future of Indigenous languages with regards to youth, language change, and language ecology.

### 2.3.1. *Globalization and top-down control*

It is not always clear whether attitudes regarding language identity are a reflection of political concerns or vice versa (Blackledge & Pavlenko, 2001). This mixing of politics and language identity can be extended to the influence globalization has on linguistic identity and vitality. The scope of these issues does not appear to be lost on many working to reverse language shift (Fishman, 2001). Because stemming the tide of globalization or the spread of US English is arguably not a feasible proposition, a more practical goal for revitalization efforts on this front can be working on behalf of the affected communities to reclaim autonomy in the

decisions on how their language and identity should be handled, (i.e., ‘linguistic sovereignty’ and ‘self-determination’) (Henrard, 2000; Tsunoda, 2005). Agbo (2002) cautions, though, that educational linguistic autonomy for Indigenous languages can come with additional responsibilities, especially during transitional periods, which require careful attention, planning and support in order to attain the desired benefits (Hornberger, 1998). Agbo continues by highlighting the lack of resources which often hinders Indigenous communities and emphasizes that this issue must be accounted for so that the local policy makers have the means to institute desired programs (§4.2.8). For general education, cultural autonomy is gaining support and seems to have a positive effect on the performance of Indigenous students (Brayboy & Castagno, 2009). Although not Indigenous and at a larger scale than most languages in North America would face, Landry, et al. (2007) present an example of how linguistic rights for Québécois in Canada became an issue of “cultural autonomy” and resulted in formal institutional support (§2.2.2) from the federal government in the form of *the Official Languages Act* (Canada DOJ, 1990). The right to maintain a language is essentially a right to maintain a language’s vitality. Landry et al. acknowledge the lack of similar rights being extended to Indigenous languages and suggest that a formal recognition of rights could be beneficial if carefully utilized. Sachdev (1995) also argues that official linguistic rights for Indigenous (aboriginal) languages are vital to support the goal of language maintenance and shift reversal (§2.1). However, Fishman (2001) strongly suggests that taking a top-down (the majority/dominant group helping the minority/weaker group) approach with the intended benefit of reversing language shift is risky and dangerous (§2.2.2), in the sense that such power-sharing can lead to additional compromising beyond what is already inherent in globalization. Fishman emphasizes that top-down support brings with it more exposure to the dominant culture, which is arguably the major root of the problem. On the other hand, Kymlicka & Patten (2003) warn of “benign neglect”, where no measures are taken on behalf of or against a language policy. They add that the State cannot avoid taking a stance, especially since public education is generally its domain (§3.1).

Related to the concern of “top-down” actions is the potential to over-rely on schools for reversing language shift, which are a domain originating from, and largely controlled by, the dominant group (House, 2002). Some groups have employed other less-traditional education methods with more local control, such as language immersion camps, with varying degrees of success (Hinton, 1998; Sims, 1998).<sup>16</sup> Fishman (2001) writes that a key issue at hand is learning where the balance of power lies for the dominant out-group language in relation to a competing language when it comes to various social functions and discovering which of these functions and domains are more crucial and susceptible to change. A language revitalization plan under this framework requires a careful mapping of each domain or function and how they relate to each other in any of the languages in question. Landry, et al. (2007) has a proposal similar to Fishman (2001) called the *counterbalance model of bilingual development* where the ideal situation for an Indigenous language would be a vibrant linguistic environment for the minority language in the home, the surrounding community and the school. Fishman (1991) argues that for schools to be successful in the reversal of language shift the language should have a role in the home and community as well (§4.4.1 & §6.7.9.2). Use in the home, while highly beneficial, is not sufficient on its own (Kondo, 1997; McAlpine & Herodier, 1994; Spolsky, 2002). This is a concern that will be expressed by the Sahaptin language community (§6.7.1 & §6.7.9.2). In Oregon, the Confederated Tribes of Grand Ronde Chinuk-wawa language immersion preschool emphasizes parental participation with the language to help strengthen the home domain as well (Johnson, 2010).<sup>17</sup> While there appears there may be a pervasive belief by the affected minority communities that Indigenous languages in the U.S. have little to no economic value (§2.2.1), there is awareness of their value in the social, ceremonial, spiritual, and other cultural domains (Tsunoda, 2005). As an example of another minority and endangered language, a majority of the

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<sup>16</sup> Partial domain reclamation was also a key topic at the 6<sup>th</sup> annual Lushootseed Language Conference (held in 2015), whereby attendees discussed starting Lushootseed nights at some cafes and restaurants where people could order and converse completely in Lushootseed. Here the transition was thought of as even more gradual than usually described and it did not begin with a elimination from English in the environment.

<sup>17</sup> Personal communication with other Indigenous language educators attempting similar parental involvement models highlighted some concerns. They reported problems with enforcement as preventing a child from attending due to parental absence in mandatory classes does not help the child or the community.

respondents to a recent study of attitudes regarding the Welsh language ranked ceremonial use as being of priority importance (Coupland, Bishop, Evans, & Garrett, 2006). Coupland et al. conclude that “ceremonialism”, which can be strongly tied to culture and identity, is likely a key factor when it comes to revitalization in the age of globalization.

### 2.3.2. *Homogeneity and monolingualism*

Another factor that needs to be considered in a discussion of linguistic identity for these languages is the attitudes towards multilingualism by monolingual English, or English-dominant multilingual, speakers in North America. Giles, Bourhis, & Taylor (1977) propose that dominant language groups can utilize various methods for maintaining the status of the language, such as legislation and ‘rational arguments’. These kinds of defensive or dismissive opinions on minority languages are present in Washington state as well, and can be seen expressed by some of the participants in the study on state K-12 Indigenous language education programs (Ch. 3). Similar attitudes are highly prevalent in the data from a study focusing on non-Indigenous individuals in the state (Hugo, 2015a). Some out-group individuals believe that language variety has little value and for the sake of the speakers some minority languages should be abandoned (Hale, et al., 1992; House, 2002). Some Indigenous languages may be seen as destined to die in a way that follows one interpretation of the concept of “survival of the fittest” (Crawford, 2000). Opinions of this nature do exist in popular thought (Lee & McLaughlin, 2001), although to what extent is unknown. The following quote illustrates one particular take on the inevitability of language death in relation to the global dominance of English and other major languages.

*“At the end of the day, language death is, ironically, a symptom of people coming together. Globalization means hitherto isolated peoples migrating and sharing space... The alternative, it would seem, is Indigenous groups left to live in isolation—complete with the maltreatment of women and lack of access to modern medicine and technology typical of such societies. Few could countenance this as morally justified, and attempts to*

*find some happy medium in such cases are frustrated by the simple fact that such peoples, upon exposure to the West, tend to seek membership in it.” (McWhorter, 2009: 16)*

McWhorter suggests that globalism is a root cause of language death and takes an arguably pragmatic view. He asks the reader to ponder what the value is of linguistic diversity compared to linguistic unity. Yet, in that excerpt minority languages are also tangentially associated (via the term ‘Indigenous groups’) with the oppression of women and ignorance, or at least militant or negligent isolationism (§2.3.1), all of which are highly questionable assertions, especially without data. Another controversial statement is that the people exposed to the ‘West’ want to join into the culture, which is a problematic view seen through a lens for North America and many other places where colonialism, forced migration, and forced assimilation took place, and are still taking place. He argues that the core loss associated with language death is primarily aesthetic and not cultural. “Native American groups would bristle at the idea that they are no longer meaningfully ‘Indian’ simply because they no longer speak their ancestral tongue.”<sup>18</sup> (McWhorter, 2009: 15) As has been illustrated earlier and will be explored further in the needs analysis (§6.7.3), this is simply not the case for most, if not all, communities. Many of these out-group opinions illustrate the perpetual process of colonialism and also the idea that monolingualism is largely rooted in ideology and politics.

Contrary to the idea that Indigenous languages have primarily aesthetic value, language clearly plays a role in the determination of federal recognition as a distinct Indigenous Nation by the U.S. government. García (2005) shows how pressure from ‘English Only’ activists, and what might be described as the linking of English monolingual identity with US nationalism, has affected not only the language policy in the US, but the perception by many on what roles minority languages should play. Quiocho & Rios (2000) add that decision making regarding bilingual education is directly affected by and is intertwined with political pressure. Nicholls

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<sup>18</sup> Much of the data from the Yakama language community needs analysis contradicts this assertion (§6.7) in the sense that they are “more Yakama” if they speak the language.

(2005) shows how allegedly unfounded claims made by government officials that Indigenous Australian students enrolled in bilingual programs were somehow deficient in English were used as excuses to cut programs. The desire to retain a minority language may also be interpreted from some in the majority as balkanization, or extremist separatism (Fishman, 2001). From this perspective, with the recent sweeping terminological switch in the U.S. from bilingual education to heritage language education, it could be inferred that English ought to remain as the dominant language and other global and minority languages should stay in the domains of localized culture and identity. Here, heritage languages are distinct from “foreign” (or “World”) languages which can have outward looking economic value.<sup>19</sup>

*“In the United States, we have gone from the two solitudes of our two languages in bilingualism, to our sole solitude in English, with whispers in other languages. Our multiple identities have been silenced, with one language identity reduced to that of a heritage.” (García, 2005: 605)*

As discussed earlier, attitudes from the dominant speech community may also influence the identity of minority speakers. The following is an example of how a local language may relate to this discussion of linguistic identity and value. A minority language group, such as learners/speakers of Twulshootseed (a dialect of Lushootseed historically spoken by the Puyallup Nation (Bates, Hess, & Hilbert, 1994)), might feel that their language has little value in the outside community (i.e., lacking overt prestige or language status). While there is the localized covert value (i.e., ascribed status) tied to culture, family and tradition, among other factors, the dominant group in Washington State might believe that the maintenance of the language should be a lower priority than people belonging to the tribe do, if it is worth pursuing at all (Hugo, 2015a). Not only do Lushootseed learners/speakers have to compete in the academic and cultural arenas for space and educational representation against the tide of English, there are many other

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<sup>19</sup> See Hugo (2015) for some data connecting similar attitudes held by non-Indigenous U.S. citizens regarding Indigenous languages specifically.

minority languages which may have higher overt prestige in the external community (e.g., Russian, Hindi, etc.).

Relatively recent bilingual education programs in the U.S. seem to have had a positive effect on linguistic identity for those tied to a minority Indigenous language (Hinton, 1998). Regardless, the apparent reality is that in Washington State official classes in minority languages, not just Indigenous languages, are fairly rare (MELL, 2009b). If positive linguistic identities are a goal for language revitalization programs, the dominant linguistic out-group shares responsibility, and not only for past denigrations of Indigenous languages (Reyhner, 1996).

It is unlikely that in the foreseeable future any of the citizens of North American Indigenous Nations will abandon English, due to its dominant economic status and cultural presence (Tse, 2001). Instead, a balance must be found between the dominant external culture and the local minority community's culture, and language is a key part of that cultural balance (Grimes, 1998). A recent study of Navajo language programs in northeastern Arizona showed that culture and identity issues often trumped actual language education in the classroom, to the detriment of the stated goals of the programs (House, 2002). House presents situations and anecdotes illustrating a strong "either with us or without us" mono-cultural model present in the same schools, which is the reverse of an earlier pro-west stereotyping. In other words, individuals may be pressured into having a single cultural identity. They are either Navajo or not (e.g., white). A more stable future for the vitality of a language will require a careful maintenance of the valued differences and similarities for each intergroup relation (Giles & Johnson, 1987). This model also assumes an effort on behalf of the dominant out-group to, at worst, tolerate and, preferably, support this bi-cultural model. Giles & Johnson also suggest that a stable intergroup relationship requires identification with both groups, the perception of closed ethnic boundaries, and a positive perception of their ethnic group vitality.

Related is the issue of whether an Indigenous language is offered solely to Indigenous students or if all students have access. There is evidence that non-Indigenous populations can be

receptive to such programs. The Karuk language, spoken in what is now northern California, was taught in non-tribal public schools and the non-Indigenous students were receptive to the program (Sims, 1998). That being said, this is a very complicated matter which is tied to political, language value and economic issues. It will be explored further in section 6.7.3 which presents the opinions of those in the Yakama language community regarding issues of access and the problems with determining who is ‘in-group’ and who should be responsible for such decisions.

There are many challenges to minority language vitality and many of them come from out-group opinions and ideologies. While section 2.3.1 argued in favor of local control for Indigenous language efforts, this doesn’t mean that non-Indigenous individuals can’t support these efforts. In fact, there is a responsibility for out-group members and institutions to reassess and challenge harmful ideologies as well as provide resources and spaces to support Indigenous revitalization efforts where it is appropriate. Some examples above also illustrated how ideological challenges can occur within minority language groups. The next section looks at one issue that particularly affects in-group attitudes about the language and education.

### 2.3.3. *Language ecology*

This section is concerned with the idea that languages are not static or necessarily simple to define. Languages change and it is important to better understand how the changes may affect the attitudes and perceptions of individuals that speak them. In turn, differences in attitudes and perceptions will likely affect the identity among those in a minority language group. Particularly for the purposes of this project, this section introduces these concepts and how they relate to language revitalization, stabilization, and policy.

As culture and language are intertwined to some degree, so may be larger issues of politics, geography and ethnicity with language. This may be described as the *ecology* of a language (Haugen, 1972; Kaplan & Baldauf, 1997). The notion of language ecology refers to the metaphorical environment in which languages exist and interact, similar to its analog of the ecology of biological forms. From the language ecology perspective, there are many factors and

complexity which can affect languages. Not only can languages change in core linguistic areas such as phonology and lexical items, minority languages may particularly be affected by the changes in the community and outside world in ways that influence what functions the language suits and how people identify with it (Mühlhäusler, 1996; Tedrow, 1977). Mühlhäusler discusses the complications and potential for controversy that comes with even identifying “something” as a language, with its complex components, overlap, and often blurred boundaries that constitute what can be called a language. Le Page & Tabouret-Keller (1985) also argue that defining a language is difficult, if not impossible, without accounting for identity and the perceptions or beliefs about which groups use which languages (§2.3). Some individuals or organizations in a speech community may feel that “their” language (perhaps the standard dialect) must be defended from outside influences and kept pure, although this endeavor could be argued as being futile at best (Dorian, 1987; Edwards, 1985). Le Page et al. go on to note that attitudes regarding what does or does not constitute the language (i.e., what is “correct”) are often passionately held. However, there is no objective or “scientific” reason to assert a standard variety is superior (Bourhis, 1982). Milroy & Milroy (1992) note that there exists no community small enough to not be affected by linguistic change, and so for Indigenous languages it is also inevitable. A more rigid and static view of language is fairly in line with the practices of some younger speakers of Indigenous North American languages. They are believed to show strong cultural allegiance to their languages, yet are open to change, even mixing with or borrowing from other languages. Or, as García (2009) describes it, they are employing hybrid language practices. This fluid and complicated nature of bilingual, or heritage language use, by younger members of a community is argued to be something not often accounted for by traditional education. In other words, the language as it was spoken decades ago may not ever be spoken again, and new forms, modes, styles may not necessarily be threats to the goal of reversing language shift. House (2002) argues that failing to recognize multilingual traditions and promoting a single standard may be self-defeating for revitalization programs. The issue of identity and ecology also raises the idea of

planning, and the question of how a ‘bottom-up’ (or right-branching) approach can occur with support from dominant out-groups (e.g., §6.2.6).

## 2.4. CHAPTER SUMMARY

The goal of the preceding chapter was to introduce some of the key concepts and methodologies related to Indigenous language vitality, policy and education. It is evident that nearly all North American Indigenous languages are threatened with extinction (§2.1). There is considerable controversy surrounding the determination of the threats and the predicted outcomes. Out-group individuals and institutions can influence perceptions of the language and its vitality in a variety of ways (§8.2.3). Researchers have attempted to create more objective ways to understand and communicate about the situations facing endangered languages. This dissertation primarily utilizes the Ethnolinguistic Vitality model as a framework for the following discussion (§2.2). Status seems to play an important role in the economic value and support for the language, which in turn can influence the effectiveness and accessibility of educational efforts (§2.2.1, §6.2.7, §6.7.2, §6.7.3.2, §8.1.1). In contrast to more commonly-taught languages, institutional support is highly deficient for most Indigenous languages (§3.3, §4.2.8, §4.4.4), including Yakama (Yakima) Sahaptin (§5.3, §6.2.7, §6.7.2, §6.7.9.4, §8.1.3). The interplay of identity, language, culture and politics is complicated, but is deserving of attention and analysis when considering Indigenous language policy and, as will be explored throughout the rest of the dissertation, tied to most aspects of resource curation (§5.5) and creation (§4.2, §6.7.3, §6.7.4, §6.7.9.5 & Ch. 7). The topic of language, culture and identity will also be revisited with respect to the findings of the needs analysis and the case studies in the conclusion (§8.2.1).

### 3. THE CURRENT STATUS OF WASHINGTON STATE INDIGENOUS LANGUAGE EDUCATION

The purpose of this chapter is to further narrow the context and clarify factors related to Indigenous languages in Washington state. Attitudes and educational policy, specifically, are a crucial foundation for the rest of this dissertation (Ch. 6). This chapter describes a study which investigates Indigenous language education programs in K-12 public schools via a survey of state educators regarding the existence of programs, available resources, and attitudes related to Indigenous language education.

While complete statistics are unavailable for which languages are still alive today in Washington state, research does exist on what languages were originally spoken in the state when contact with Europeans first occurred, roughly around the late 18<sup>th</sup> century (Gunther, 1972). Figure 1 is a map cropped to the current borders of Washington state that shows the boundaries of where these 24 languages were spoken at that time. Names in ALLCAPS are languages, and other standard cased names within a particular boundary are dialects of that language. The shading represents the phyla the surrounding language belongs to.<sup>20</sup>

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<sup>20</sup> A legend for phyla is not included to save space as the information is not crucial for this particular discussion. Interested readers should refer to Suttles & Suttles (1985) for more information.

Figure 1 Map of Indigenous languages that were spoken in Washington state at time of contact (from Suttles & Suttles, 1985)



In 2009, there existed significant gaps in knowledge concerning language education in Washington State public schools. While some parties had made substantial progress on this front (Govig, 1999; MELL, 2009a, 2009b), current information was still limited. In particular, accurate details regarding the teaching of Indigenous languages in Washington State were less available than other more commonly-taught languages. In order to help expand our understanding of the current state of Indigenous language education in Washington State I

conducted a survey of educators from public K-12 institutions in the state.<sup>21</sup> That project is summarized in this section.

My study had two goals: The first was to learn which Indigenous languages were being taught. The second was to discover what factors may influence the likelihood of an Indigenous language program existing in Washington State. Some factors of interest for this latter question include what resources are available (§2.2.2), as well as what attitudes and opinions educators have related to Indigenous language education (§2.2.1). Background information of this type can be very useful for supporting needs analyses (§6.2.4 & §6.2.7), including the one conducted for the Sahaptin language community.

To answer these questions an online questionnaire was developed building on Giles, Bourhis, & Taylor's (1977) ethnolinguistic vitality framework (§2.2). The questionnaire was then distributed to educators and administrators for each public school<sup>22</sup> or district in the state where 30 or more Indigenous students were in attendance.<sup>23</sup> A total of 40 respondents completed the questionnaire.

### 3.1. KNOWN INDIGENOUS LANGUAGE PROGRAMS IN WASHINGTON STATE

The main findings of the project were that formal Indigenous language education in the state's public schools appears to be rare, as only seventeen public schools were reported as

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<sup>21</sup> See (Hugo, 2010) for the full details of this study. This research was conducted in partnership with the Mapping and Enhancing Language Learning (MELL) project and the Office of Superintendent of Public Instruction (OSPI) for Indian Education for Washington state. Help and information were supplied by both entities and the results of this study are intended to support their work.

<sup>22</sup> This included 'tribal schools' with a public designation.

<sup>23</sup> The questionnaire was sent to at least one representative of the 153 schools which, according to the Washington state OSPI for Indian Education, had at least 30 students who were identified as Native American/Indigenous American (OSPI, 2010). More than 200 individuals were contacted.

offering a program. The Indigenous languages offered in schools at that time according to the respondents<sup>24</sup> were Makah, Quileute, Yakama (Sahaptin), Lushootseed, Klallam (Straits Salish), Southern Okanogan<sup>25</sup>, and ‘Salish’.<sup>26</sup>

The map below (Figure 2) shows the locations of the individual schools known to have offered a program in 2009. While this map is incomplete due to the limitations of the study, it reflects the most complete figures currently available related to what Indigenous language programs existed in Washington state public schools at the time. Except for the schools in Yakima county (§5.3), all were located in the northern half of the state. While future research is needed to fully explain this northern tendency, one possibility is that most of the languages in ‘the southern region of the northwest’ (northwest coast region) were extinct as early as the late 20<sup>th</sup> century (Thompson & Kinkade, 1990). Another reason may be the proximity to Canada (especially British Columbia) which had a comparatively more active formal education policy for Indigenous languages (FPHLCC, 2010).

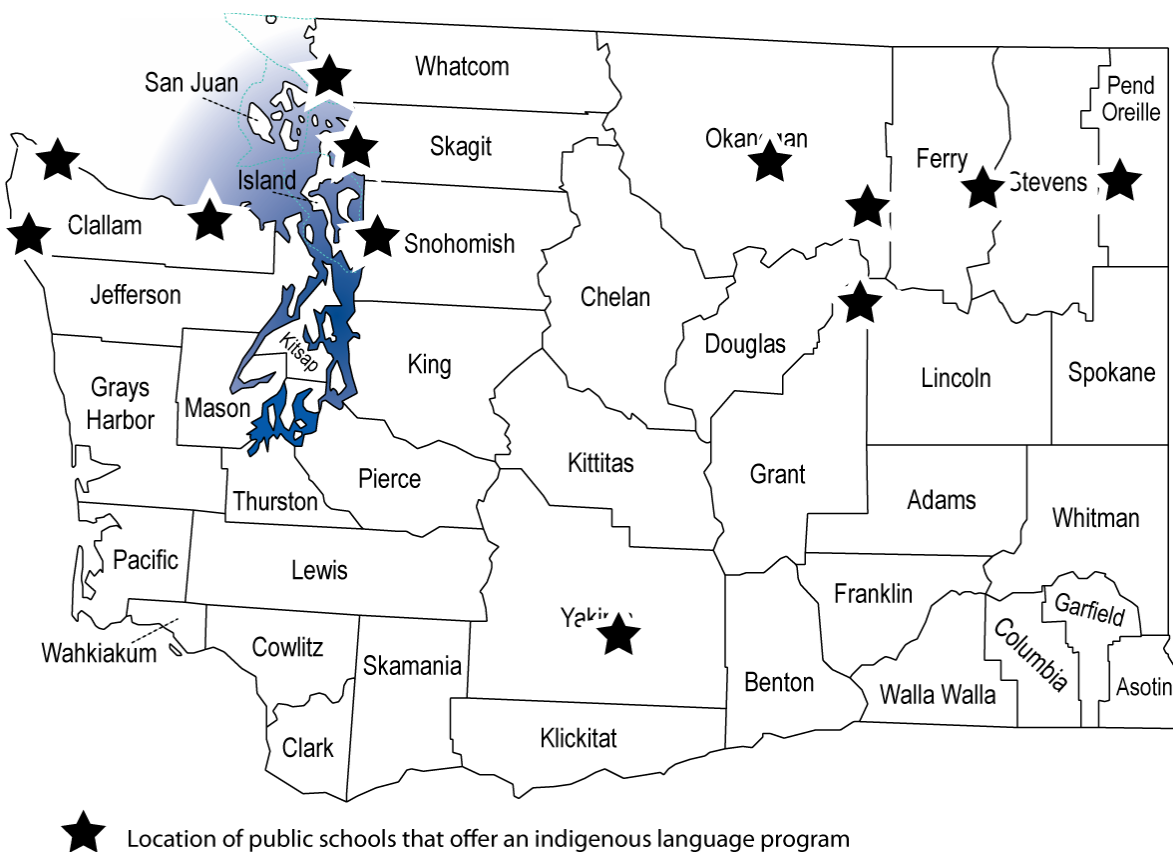
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<sup>24</sup> See Question 5 & Question 6 in the Appendix for the study on Washington State Indigenous language education.

<sup>25</sup> This was reported as “(Salish) Southern Okanogan Language Dialect of Plateaux”.

<sup>26</sup> There were numerous responses given for “Salish” in this study and MELL. Unfortunately, which Salishan language each school was actually teaching is not known.

Figure 2 Map of Washington state public schools that offer an Indigenous language program



The study uncovered two possible factors affecting the number of programs that exist. The first factor was the attitudes regarding Indigenous language education and revitalization efforts held by the educators responding, and to some degree beliefs about the attitudes of policy makers and community members (§6.7.1 & §6.7.10), appear to have a largely positive influence. The second factor was institutional support (§2.2.2). In general, there was a lack of resources for Indigenous language programs, which has had a negative effect on the likelihood of a program

existing.<sup>27</sup> However, some forms of formal support (e.g., legislation) appear to have had a positive effect (Hugo, 2010).

The Indigenous language programs in Washington state public schools described by the respondents to this study had, on average, existed for 14 years. They generally utilized a traditional approach to classroom instruction (§3.1) and allowed both Indigenous and non-Indigenous students to enroll.<sup>28</sup> They were offered more often to high school or elementary students than to students enrolled at a middle school.<sup>29</sup> The primary method of assessment was oral and standardized assessment of any kind was uncommon. Finally, on average, the reported programs were believed to be only *moderately successful* (a mean of 3.23 on the 5 point scale) in meeting their declared goals (§3.1). However, it appears that these Indigenous language programs generally deviated in other areas from more commonly-taught language programs (e.g., Spanish, French, etc.). For example, the reported Indigenous language programs were likely to have a dominant pedagogical focus on culture, as opposed to grammar or literacy.<sup>30</sup> Respondents were also asked about their existing resources and what kinds of resources they were interested in acquiring. These programs often lacked materials and other resources, including textbooks and

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<sup>27</sup> It should be reiterated that this study only examined public K-12 schools, and not tribal schools that have no state affiliation, or language programs external to normal K-12 school curriculum (e.g., Saturday community classes).

<sup>28</sup> This topic will be returned to with respect to access to the online archive (§5.4.2 & §5.5.4) and online course (Ch. 7) and is a major focus of the needs analysis (§6.7.3.2).

<sup>29</sup> A more theoretical concern is the notion of acquisition. Recent language acquisition research (Herschensohn, 2007) has shown some potential benefits for exposing children to a language earlier in their life, and should be considered when planning which grade levels a program is offered to.

<sup>30</sup> As will be reviewed later on, culture was reported as being a lower priority (§6.7.9.5) for the Yakama language educators responding to the NA, but due to a lack of more linguistically rich resources and community interest it still played a prominent role in the classroom (§6.7.1 & §6.7.2).

native speakers. There was a strong interest in computer-based software (§4.2), audio recordings (§5.4.5), and dictionaries.

The study suggested that the status (including the value) of Indigenous languages may be tied to non-Indigenous languages and associated policies. There appeared to be an effort by educators to equalize the status of Indigenous languages in relation to other non-English languages taught in Washington state public schools. Some of this work is supported by utilizing certain terminology (e.g., “heritage mother tongue”), technology, methodology, or even forms of access. For example, traditional classroom instruction (§3.1) (as opposed to weekend classes, community offered courses, immersion camps, etc.) was the most common type for the programs described by the respondents. The traditional setting places an Indigenous language in-step with recent Washington state legislation, and on similar symbolic footing as other more commonly-taught languages (e.g., Spanish, Chinese, French) in the school domain (Wiley, 2005). Although it is not clear what the ideal language education situation is (e.g., immersion vs. community-based) (FPHLCC, 2010), the prominence of traditional education could be considered a positive trend as traditional courses offered regularly scheduled classes and also have increased eligibility for college entrance equivalency (§2.2.2).

K-12 Indigenous language programs in Washington State appear to be rare and under-resourced. Educators, on average, consider their programs to be only moderately successful. However, educators are working to improve the effectiveness of their courses and to bolster the status of Indigenous languages within the state’s educational system. A common theme that arose in the data was that many educators believed there is a strong relationship between culture and language (cf. §2.3). In the next section, I will present some of this data and discuss how it

relates to the situation examined by this study as well as the other projects described in this dissertation (§6.7.3.3 & §8.2.1).

### 3.2. CULTURE AND LANGUAGE

One positive effect of a perceived link between culture and language (§2.3) is in program access, which in turn may influence the likelihood of a program existing. Some respondents commented that teaching Indigenous languages is a good method for exposing non-Indigenous people to the culture and history of each tribe. One respondent made an explicit note to label Indigenous languages as “world languages” (§2.3.1), stating that “by learning a world language everyone has a chance to experience a ‘world view’ that can't be translated to English”. The importance of teaching an Indigenous language to anyone, regardless of tribal affiliation, was a common theme expressed by respondents in the optional comments.<sup>31</sup> As a relatively recent example of classroom makeup and access in a Washington state school, non-Indigenous students made up more than half of a classroom in the city of Spokane where the Spokane dialect of Salish was being taught. Participants argued that an interest in learning more about the local Indigenous culture was a primary reason for their attendance, something that was also reported in a study by de Leon (1997). In fact, the majority of programs described by this study allowed non-Indigenous students to enroll. For the two programs that did not allow non-Indigenous students access, stipulations accompanying the funding was given as the reason for this decision.<sup>32</sup> None of the respondents stated they were against offering the language to all

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<sup>31</sup> This topic will be revisited again in the Yakama needs analysis where it is much more controversial (§6.7.3.2).

<sup>32</sup> In one case funding was allotted for heritage learners only, while another school stated the restriction was due to Title III funding, which may refer to OELA (2008).

students.<sup>33</sup> Some reported potential benefits of open access to all students include the cultural understanding discussed above, more potential speakers, and a larger number of potential students at each school. This latter benefit may be related to the likelihood of a program being offered. If a language program is open to any student then the possible enrollment pool extends beyond the Indigenous students culturally related to a language in question at a particular school, and with more students there may be an increase in the level of demand.

While all of the respondents felt that it was very important to teach these Indigenous languages, particularly resonant was that a major benefit of teaching the language, in addition to the reinforcement of the related culture, is a positive effect on Indigenous student identity (§2.3), a point that will also be seen with the Sahaptin language community (§6.7.1). One respondent specifically commented that some cultural values cannot be divorced from language, and another stressed that a language program is one of the most effective means of preserving the identity of Indigenous peoples. There was a clear concern that various entities, such as the federal government, putting official restrictions on language use (§2.2.2) as well as a diminishing of general cultural ties for Indigenous students (§2.3.3) have had negative effects on the vitality of the language in addition to student identity. Some respondents argued that for these languages and cultures to survive, acceptance and respect are both a necessity, particularly from the younger generations of the Indigenous communities. It was suggested that this acceptance and respect may be taught in the classroom, and that they both can reinforce student identity and self-esteem. One respondent noted that improving students' self-esteem was one method of determining whether their language program was successful (§2.3.3). The respondents reported

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<sup>33</sup> Data from the needs analysis of Yakama educators shows that this idea is much more controversial in certain communities, as out-group access was arguably the most contentious topic covered by the needs analysis (§6.7.3.2).

that culture was, on average, the most emphasized factor in the classroom. When asked about the ideal outcome for students completing their program, a strong majority of respondents noted the goal of their students learning about culture and enhancing their identity through an understanding of the culture and positive self-esteem, while language fluency or linguistic skills were underrepresented. House (2002) saw a similar focus on culture with a Navajo (Diné) language revitalization program and cautions that although culture is important, the purpose of these courses is to develop proficiency in the language and placing too much of an emphasis on culture can detract from actual language learning.

The perceived connection between culture and language appears to have positive effects on Indigenous language programs by increasing the perceived value of marginalized languages (§2.2.1), providing alternatives to those with limited resources, and as an argument for increased access (§2.2.2, §2.3.1, §4.4.1 & §6.7). Although culture-oriented instruction may be preferable to nothing, if student fluency in the language is a goal, a pedagogical balance should be struck between culture, grammar, literacy, speech, etc. (§4.2.2). In other words, perhaps it should be periodically reassessed whether the central purpose of a respective program is for language education or cultural education.

This topic of culture and how it relates to language education is encountered elsewhere in the projects described in this dissertation (e.g., §4.2, §4.3 & §5.5). As will be seen later on, a concern for protecting sensitive culture often plays a role in attitudes and oversight related to the teaching of a language and the development of materials, including the Sahaptin language community (§6.7.3). As the respondents to this study were reported as being a part of the educational program offering the cultural and linguistic content for learners, these ideas were not

much of a concern. However, this topic is incredibly complex and will be revisited periodically as necessary as it ties into nearly all aspects of this dissertation.

### 3.3. A LACK OF RESOURCES

One common problem for most of these programs was a lack of resources.<sup>34</sup> Textbooks, audio files, dictionaries, trained instructors and especially native speakers were rarely available and materials were of generally poor quality (§6.7.1 & §6.7.2). Core linguistic pedagogy, such as grammar, literacy, phonology, etc., requires an instructor with a fair level of training and knowledge of the language or, if nothing else, properly designed materials (§4.2.5 & §5.2). Since these types of training and resources appear to have been fairly rare, it may have seemed to be a more practical alternative to construct a large portion of the instruction around culturally oriented or “simplified” language. For example, a teacher could design lessons which include vocabulary and phrases specific to a cultural topic, event, or activity (e.g., plant vocabulary for a hike, clothing, regional geography, etc.). It could be argued that emphasizing the cultural over the linguistic could have a negative effect on the chances of the program resulting in speakers with substantial fluency in the language (§4.2.1). Yet, if the resources are not present to offer a more pedagogically-robust program, culturally-oriented classrooms may be a much-better-than-nothing alternative. The findings from this study prompted the development of the proposals for resource development described in chapter 4.

Most North American Indigenous languages are highly threatened and require substantial support, particularly in the form of resources. Crucially, Indigenous languages, on the whole,

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<sup>34</sup> The Yakama language community needs analysis found a lack of even more general resources such as basic classroom equipment (e.g., projectors, audio speakers) and computers for student use (§6.7.10).

face a much greater degree of need, urgency, and situational complexity than most, if not all, more-commonly taught languages. The political and cultural power imbalance requires additional awareness and caution when approaching the issue of supporting educational efforts as an out-group member (§5.5, §5.6.4, §6.2.4 & §6.7.3). For example, an individual developing pedagogical resources a more-commonly taught language would likely have few to no concerns with respect to the cultural content included in them. In addition, there is a stable population of L1 speakers, domains where it is the dominant language, etc. Because for many Indigenous communities the language is a particularly vital part of their cultural and political sovereignty (§2.3 & §6.2.4), whether symbolic or not, educational policy and resource development can be a divisive and troubling issue for many people, as will be seen in the data from the Sahaptin language community needs analysis (§6.7.3.4). Other more dominant languages have a variety of resources dedicated to them. There are multiple widely used, professionally designed textbooks for them as well as many cutting-edge technological resources. Getting raw content or the finances and expertise to develop such resources are relatively of no concern at all compared to the resourced-impooverished Indigenous communities in North America and elsewhere.

### 3.4. CHAPTER SUMMARY

Indigenous languages in Washington State were extremely underrepresented in public K-12 schools in 2009, at the time of the study summarized here, and likely still are. In general, classes that did exist faced many challenges that more commonly-taught language courses did not. At the root of this problem was a profound lack of resources, especially trained educators and basic pedagogical materials, such as textbooks. Students may also lack access due to geographical barriers. While some languages were available in K-12 schools through distance

and online learning, Indigenous languages were not among these. The next chapter examines how technology might be able to address these concerns regarding a lack of resources, limited pedagogical potential (§4.2.3) and reduced access (§4.4). However, it takes a skeptical approach and includes an audit of existing technologies for Indigenous languages in the Pacific Northwest to see what challenges and incorrect assumptions may still be affecting the Indigenous language learning community.

#### 4. ENDANGERED LANGUAGES, TECHNOLOGY AND LEARNING

This chapter reviews some of the key issues facing modern resource development for Indigenous languages.<sup>35</sup> A series of proposals are made to guide the creation of more effective and efficient projects, both in the short and long term. Using these proposals, the resources created for a more commonly taught language (Korean) are compared with recently developed technology-based resources for Indigenous languages (primarily Dakelh). The proposals and the findings from the comparison (§4.3) constitute the core framework for the case studies described by this dissertation (Ch. 5 & Ch. 7).

Each language learning technology solution<sup>36</sup> has a unique set of technical and pedagogical options, costs, required expertise, and predicted lifespans. Moreover, technology is constantly changing. Therefore, it is important to occasionally revisit and reassess past attempts and arguments (e.g., Moore & Hennessy, 2006; Ward, 2004) in order to identify which solutions are most feasible and effective, with the greatest long-term potential.

Endangered language educators and specialists continue to have a strong interest in technology, as was highlighted in the data from Washington state K-12 educators (§3.3) and as will be seen in the needs analysis data for the Sahaptin language community (§6.7.2). This chapter focuses on the possible roles and limitations of technology with respect to the teaching and learning of endangered languages. The discussion is oriented around past attempts to utilize

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<sup>35</sup> Portions of this chapter appeared in Hugo (2014). This chapter expands and updates that information in order to address the specific focus of this dissertation.

<sup>36</sup> The term 'solution' will be used to refer to any proposed use of technology for language education or education support.

technology for this purpose, often undertaken without asking the questions that should inform the selection or development of a language learning solution. Despite the unique challenges presented by endangered languages, I will argue that current technology can provide options for the modular and short-term deployment of content, provided that such development is undertaken in the context of a *long-term, well-conceived project*.

This chapter is organized as follows. Section 4.2 presents eight fundamental questions that should be asked when considering a technological solution for endangered language learning. To illustrate the difference between typical pedagogical solutions for an endangered and a non-endangered language, section 4.3 contains a detailed linguistic analysis and cross-comparison of learning materials made for Korean and Dakelh. Section 4.4 presents a model which can address the questions raised in section 4.2, leveraging centralized resources to support collaboration, distribution, assessment and the archiving of content for endangered languages. Section 4.5 concludes with a brief discussion about a possible divide between applications for language learning versus language documentation.

The observations and arguments outlined in this chapter provide the rationale for the two case studies undertaken for this dissertation, the online archive of learning materials (Ch. 5) and the sample online course module (Ch. 7). These two projects are an attempt to address the problems affecting earlier efforts to utilize technology for these purposes by following the proposals made in this chapter as closely as possible in order to better assess their effectiveness and feasibility.

Much of this chapter has been influenced by work being done to revitalize Indigenous languages in the Pacific Northwest of North America. However, the suggestions and

observations should be relevant to similar revitalization efforts throughout the world and are especially pertinent to areas with limited access to sufficient technological infrastructure (e.g., servers), yet where there exists some degree of reliable internet access.

#### 4.1. FUNDAMENTAL QUESTIONS FOR ENDANGERED LANGUAGE LEARNING TECHNOLOGY PROJECTS

The urgency of the situation for endangered languages continues to increase (§2.1) and at the same time, the options for technological solutions are increasing dramatically. The survey of Indigenous language educators and administrators (kindergarten-12th grade) in Washington State of the United States (Ch. 3 & Hugo, 2010) uncovered a few dominant themes: a general lack of resources and a strong desire for those that are technology-based. The general quality of any existing technological resources was low, illustrating the problem of obsolescence. Subsequent conversations with educators have echoed this interest, but answering the question of how to implement technology is complicated. Educator opinions on what is needed or expected from technology can vary considerably, as will be seen later in data from the Yakama needs analysis (§6.7.9.3). Out-group attitudes seem to suggest a lack of demand (Hugo, 2015a) could limit access to classes, as well as resources to develop and sustain materials. This highlights the value of alternative access options for increasing the efficiency of resource creation through remote collaboration.

##### 4.1.1. *What are the goals?*

When establishing a technology-based solution, it is vital that the goals for a solution be clearly defined and understood, as each solution can differ substantially in its effectiveness for

achieving the desired goals within the bounds of most budgets. Some common goals for adopting technology for language education include:

- *affective benefits* (further explored in §4.2.4 and seen in the data for Washington K-12 schools in Hugo (2010) & for Yakama in §6.7.10) (i.e., to improve the students' self-esteem or increase participation),
- *classroom support* (i.e., to lessen the administrative burden of the instructor and free up more class time, to utilize hybrid learning models where part of the student's time is spent in class and the other part is conducted online (Snart, 2010), for media to be accessed outside of class time),
- *content development* (i.e., collaborating, creating materials, and basic documentation) (§5.6.6),
- *enhanced language learning* (e.g., practice, structured feedback and reinforcement, additional domain usage), and
- *increased access* (e.g., distance learning, a downloadable application) (discussed further in the Sahaptin needs analysis data in §6.7.2, §6.7.3.5 & §6.7.7).

Each goal may differ when it comes to prioritization, depending on the urgency and the practical limitations of a particular situation. For example, a solution for granting affective benefits (e.g., a website with a modern design that describes a hypothetical language) and increasing access (e.g., a flashcard application) could cost considerably less time and money than a self-paced online introductory course (Newman, 1998). Yet, once more, the focus should be on the larger goals. As the situation is urgent, how can the vitality of the language (§2.2) most likely be improved?

#### 4.1.2. *What is the content?*

Applications dedicated to vocabulary learning seem to be one of the most common types developed for endangered languages in the Pacific Northwest. While there is value in a technologically-based flash card system for convenience, ease of distribution, and possible affective benefits, creating something that has a pedagogical advantage over paper cards and other methods requires a level of complication that is not feasible for most stand-alone products built from scratch (Kim, 2008; Li, 2010). Most of these lexically-oriented solutions utilize impressive culturally authentic media (e.g., photos, video created by community members) yet more often have limited language content (e.g., less than two hundred words).

While these resources can be valuable for educators and learners, what is the actual language learning potential? Students can only learn or acquire the language they are exposed to, that being the linguistic content (Storch, 2008). There are many more complicated extensions of this basic idea, including the input hypothesis (Krashen, 1992), but at a basic and hypothetical level, if learners are only exposed to fifty vocabulary words, in a best case scenario they will only learn those fifty words. Perhaps, depending on the input, they might also glean some morphological or phonological awareness. While raw authentic language has its place in language education, learners must be provided plenty of linguistically rich, pedagogically sound (§4.2.3) and comprehensible input.

For the purpose of this dissertation, the term *linguistically rich content* can be defined, based on the research given above, with the following guideline: *The content should contain sufficient information connected to each part of the language with respect to the total input*

*available to the learners. This includes morphological, orthographical (when applicable), phonetic, phonological, semantic, syntactic, and pragmatic information.*

This guideline states that the total content should be representative of the actual language. For example, a vocabulary flash card system may only present lexical and orthographical information. An essay, on the other hand, may contain additional information (e.g., syntactic, semantic, morphological), but it must be kept in mind that content containing robust linguistic information alone is insufficient for most educational purposes and the pedagogical organization and presentation is crucial.

#### 4.1.3. *Is the pedagogy sound?*

With any student-oriented solution/application for language learning there must be some degree of language-based content presented to the user. At the most basic level, only the information contained in the content is potentially accessible to the language learner. The pedagogy determines how effectively the content is presented to the learner. The likelihood of the content being learned is improved if it is presented in pedagogically sound ways and provides input, feedback and opportunities for output that are supported by research (e.g., Beaudoin, 2004; Berlin, 2000; Klug & Whitfield, 2003; Ohta, 2001; Ryffel, 1997;). Figure 3 below is a highly simplified diagram included to highlight the point above and provide a reference for the following discussion of each section of the diagram.

Figure 3 Diagram of the content shaping process



For many endangered languages, access to classes and materials may be limited or geographically isolated, as can be seen with Washington state (§3.1 & §3.3) and specifically, the Sahaptin language community (§6.7.1 & §6.7.2). Thus, technological solutions offering mere ease of access are far better than no access at all. The online learning materials archive, which is described in §5.6, is a solution that is concerned primarily with increasing and improving access. However, technology may also provide additional learning time through online courses, spaces to collaborate and communicate at a distance, and access to additional media that would not otherwise be cost effective to produce and distribute as hard copies. Yet, it is important to separate functionality that supports classroom operations and content distribution from functionality that can support language learning. Unfortunately, it can be difficult to get a clear assessment of the effectiveness of a technological solution. Clark (1983) argues that functions which provide additional learning time, materials and collaboration may increase the appeal of newer technologies and media over older technology, regardless of actual pedagogical potential.

There exists a belief that more modern technological solutions may have a pedagogical advantage over other mediums, such as textbooks. In section 4.2.3.1 some of the key research is briefly reviewed to see how many assumptions about efficacy are not as clear as they might first seem. The development and assessment of a solution should be informed by some understanding

of related language acquisition and learning research. Section 4.2.3.2 introduces some of this research and emphasizes the importance of understanding the learner's level, the content they are learning and how the sociocultural theory model of scaffolding should be considered when assessing any learning solution with a self-directed component.

#### 4.1.3.1. *Expectations of technology's pedagogical potential*

It is fairly common to see in more mainstream education publications arguments suggesting that current and upcoming technologies will have a clear, positive effect on learning and student achievement (Kaufman, 2013; Luzzaro, 2012; Prensky, 2012; Studyblue, 2012). Educators have also made comments related to utilizing technology with the goal of enhanced language acquisition that were either based on a highly optimistic view promoted by companies such as Rosetta Stone and Live Mocha or describing it as something of an impossibility (Murphy, 2012; Shaughnessy, 2003).

Clark & Salomon (2012) suggest that a key issue is the assumption that media or technology can *naturally* influence (i.e., has an inherent benefit for) the learning process versus the idea that technology gives educators new tools to reconstruct and present information in new ways. Namely, it is the functionality and pedagogical flexibility that certain technologies can provide as opposed to an inherent benefit in technology itself that shows any potential.

Clark and Sugrue (2012) note that researchers subscribing to a *strong* media and technology effect, wherein a certain technology has a specific or unique effect on learning, have consistently argued that newer media platforms were more effective than older platforms (e.g., television > textbooks). However, Clark and Sugrue argue that follow-up statistical analyses showed this *strong* perspective to be untenable due to numerous confounding factors. "When a

medium delivers a symbol system containing this necessary arrangement of features, learning will occur also but will not be due to either the medium or the symbol system.” (Clark & Sugrue, 2012: 81)

Some larger meta-analyses suggest there may be a marginal benefit for student learning to be gained from incorporating technology into the learning process (Liao, Chang & Chen, 2008; Soe et al., 2000; Tamim et al., 2011). Felix’s (2008) review of past research posits that while there are potential benefits of using computer assisted language learning (CALL) for spelling, reading (Soe et al., 2000), and writing, these benefits are limited and favor the first language (L1) over the second language (L2). Therefore, both the potential for pedagogical functionality of each system and the pedagogical framing of the content should be primary concerns.

#### 4.1.3.2. *Incorporating language learning and acquisition research*

Since CALL or online materials and courses may be the only option for many endangered language learners, the choice of a technological solution for endangered language education should be informed by both theoretical and applied language acquisition and learning research. Applying results of second language acquisition (SLA) research can make a substantial contribution to the process, especially with respect to issues of age, length and type of exposure to language and for general acquisition patterns and feasibility issues (Chapelle, 2001; Clahsen & Muysken, 1996; Ellis, 2002; Ellis, Loewen & Erlam, 2006; Herschensohn, 2007; Thorne, S.L. and Smith, B., 2011). In particular, Ellis (2006) provides a good review of the arguments and research which support the teaching of grammar over pure discovery learning methodology.

Understanding a learner’s proficiency and knowledge levels in addition to their short and long term learning goals and trajectories is crucial. Krashen’s (1989) input hypothesis provides a

clear conceptualization for more generalizable learning trajectories and the importance of understanding where a learner is at in their own learning process. He posits a model ( $i+1$ ), which assumes a natural and linear order of acquisition for linguistic concepts (e.g., 1. past tense, before 2. perfect aspect, before 3. pluperfects, etc.) and that a learner's ideal input is both comprehensible and minimally advanced (i.e.,  $+1$ ) from their current level (i.e.,  $i$ ). Under this model a learner would be less likely to acquire language from input that is too "advanced" and incomprehensible.<sup>37</sup> Many more commonly-taught language textbooks adhere to a similar, but flexible interpretation of this concept. Instead of providing each student a dictionary and a classical grammar text, both vocabulary and grammar are integrated with other linguistic and cultural content in a way which is perceived as being more facilitative of the learning process.

Additionally, in the case of endangered languages, in contrast to more commonly-taught or -spoken languages, many learners have access to very little, if any, domains where natural communicative language exists (§2.3), as will be seen is the case for Sahaptin as well in §6.7.9.2. For these languages, in general, the quantity of the input is impoverished and the quality of the input is low, such that the content is not linguistically rich enough to transmit sufficient language information to a learner to achieve a native-like proficiency. Even if a learner were extremely adept at language acquisition and had no difficulty in correctly parsing input for speech errors, contradictions, complications and general comprehensibility, the input in many of these scenarios will almost surely not present the learner with all the necessary language information.

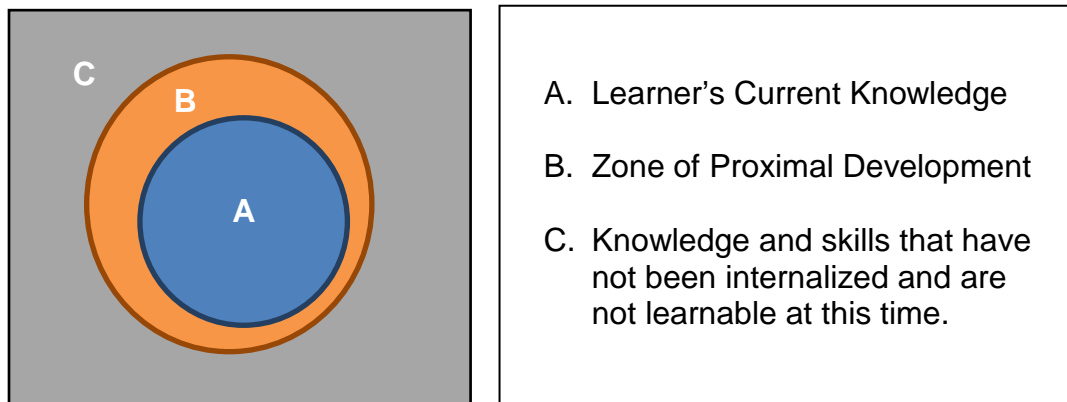
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<sup>37</sup> This issue is illustrated in the Yakama needs analysis and personal communication with Yakama language educators. Beginning students are rarely explicitly taught the orthographical system of the language, which could affect their language development and limit access to certain resources. This problem is explored further in section 7.1.2.

Thus, the quality and organization of the content must be maximized to help account for the deficit of quantity.

Sociocultural approaches to second language education provide excellent models that can be utilized to integrate content and functionality into technological language learning solutions. The sociocultural theory model of scaffolding (Wood et al., 1976) builds on the work of Vygotsky, the Zone of Proximal Development (ZPD) and its application to language learning (Donato, 1994; Ohta, 2000). A simplified description of the ZPD, for the purposes of this argument, is that there is a non-linear area which represents a learner's proficiency and knowledge. Surrounding this area of knowledge there is a 'zone' of knowledge and skills that may be learned (or *internalized* (Swain, Kinnear & Steinman, 2011: 8)) or performed with assistance or mediation. Outside of this zone are elements that are not feasible at that point in time, even with assistance. Figure 4 is an illustration of a hypothetical ZPD.

*Figure 4 Simplified diagram of a hypothetical Zone of Proximal Development*



The ZPD has a particularly useful extension for language pedagogy (and pedagogy in general) with the idea of scaffolding. On a more theoretical level, scaffolding can be thought of as the assistance within the ZPD that a learner can utilize in order to reach a learning goal. For

example, if a learner is trying to accomplish a certain learning task, such as composing a paragraph, they may have the necessary grammar knowledge but are impeded by limited lexical knowledge. Thus the teacher may ‘scaffold’ the exercise by providing the learner with access to a dictionary. For beginning language learners a substantial amount of ‘scaffolding’ (i.e., assistance) may be required to perform a particular task, but as their language proficiency develops, the scaffolding can be ratcheted down until the learner is able to accomplish the task without it. Then, the skill or knowledge for that particular context or type of interaction is thought to be internalized. Scaffolding is, in one sense, working within the ZPD in order to better facilitate learning. A clear illustration of this concept at a more macro level, and of the limits of pure grammar discovery methodology, can be seen in the Sahaptin language community. In the community, there appears to be seemingly limited attention given to explicit or focused pedagogy dedicated to orthography prior to introducing reading exercises (§5.2).

Scaffolding and the ZPD are particularly relevant to the topic of technology-based learning tools for endangered language education since traditional classes are rare in most cases and many technological solutions for learning may be used in a self-directed manner. Even in situations where classes exist, such as those in the Yakama area which this dissertation is focusing on, the classes lack trained instructors and resources (§6.7.2). Therefore, there is a need to properly organize online resources, whether CALL modules, or non-interactive learning materials (e.g., the Sahaptin learning materials archive described in Chapter 5) so that they can be more effectively integrated into the classroom. In other words, improving the categorization and accessibility of the resources will allow instructors to better scaffold with the resources (§5.6).

Often with existing solutions, if the focus is primarily on the dimensions of learner knowledge, scaffolding, and learning task, then the learning task is the only one that is well-utilized. There, it is usually the case that the learner's knowledge is assumed and assessment is simply done to confirm whether a learning goal or task has been accomplished at that point in time. In these types of systems learners may simply progress through lessons in a linear fashion. If the learner's proficiency level is better understood, then the gap between the learning goal and what level of assistance, if any, will be necessary for the task to be completed successfully will be better understood. With this information, scaffolding can be provided for learners with the content and the system can mediate the learner's performance until the learning task can be achieved with no scaffolding. If it is available, functionality that can account for all of the dimensions described above should be utilized. All of the learner progress may be stored, reassessed and even retrained at later points. The related data can also be used to guide the presentation of future content for that learner, and if enough data is available, for future learners.

The non-linear model of the ZPD also effectively captures the complexities of language learning. Digitally based content does not need to be organized in a linear fashion. Instead there are systems (some of which will be explored in §4.3) which allow for various lessons and content to be arranged along multiple dimensions using conditional checks (e.g., assessment, completion, etc.). These checks can help guide the learner to content that is estimated to be a better fit for their current estimated ZPD and learning goals. While at this point it seems that technology-based solutions cannot effectively account for all modalities and facets of language learning, especially when self-directed (e.g., automated speech assessment), those that they can handle fairly well (e.g., lexicon, listening, reading, syntax, semantics, etc.) should be organized

according to the entire linguistic system as well as what can be determined about the learner's knowledge, goals, and the context of both of these.

Finally, there are other pedagogical concepts that should be considered to maximize the effectiveness of a solution, but are also beyond the scope of this chapter to provide a detailed review. These include *interaction* (Van den Branden, 1997; Lantolf & Thorne, 2007; Mackey, 1999), *implicit and explicit feedback* (Mathan & Koedinger, 2005; Lyster & Ranta, 1997; Schmidt, 1995), as well as *gaming and motivation* (Cornille, Thorne, & Desmet, 2012; Jalali & Dousti, 2012; Peterson, 2010; Sylven & Sundqvist, 2012). Providing opportunities for learner *output* (Swain, 2005) is a challenge that many solutions have yet to overcome, but its importance should not be ignored, especially as technology develops. While culturally authentic and contextualized content is often well represented in locally produced endangered language learning materials, there is research worth considering on methodologies related to culture and communicative competence. For example, Task Based Language Teaching concepts might prove to be effective if integrated into language learning technologies (Chun & Guofang, 2011).

For the purpose of this dissertation, the term *pedagogically sound content* is defined, based on the research given above, with the following guidelines:

- 1) *The larger content grouping should be organized according to the linguistic information contained within it and with respect to the level of the learners (e.g., n+1, scaffolding, etc.).*
- 2) *The more discrete content (e.g., exercises, questions, explanations) should be presented to the learner with varying degrees of metalinguistic explicitness also taking into account current pedagogical theory and the language level of the learners.*

Guideline 1 suggests that the organization and presentation of the content needs to be informed by the knowledge and skills of the learner. For example, if a learner's knowledge of the language is primarily limited to lexical items and that learner is presented with an unparsed poem consisting of more than five lines, even with the assistance of a dictionary, it is unlikely the learner will successfully translate the poem, comprehend it and glean much grammatical or metalinguistic information from it. Instead, a thorough understanding<sup>38</sup> of the content, either by the instructor or author, should be balanced with pedagogical theory such that the information is presented to learners appropriately.

Guideline 2 states that content should vary in what extent it is metalinguistically explicit. While raw language has an important part in language learning, some degree of metalinguistic information and explanation is likely necessary. Especially as many endangered languages have incomplete documentation or lack the domains necessary to provide abundant opportunities for learners to receive natural input and feedback as well as produce output, a metalinguistic understanding of complicated aspects of the linguistic system (e.g., grammar) is important. As an example, many of the Yakama language materials in the archive contain grammatical and spelling errors (§5.6.6, §6.7.6 & §7.1.1).<sup>39</sup> A stronger metalinguistic understanding of the language, combined with an awareness of the existence of errors in the materials, should help learners make better use of the input and perhaps improve their noticing of metalinguistic information.

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<sup>38</sup> 'Understanding' is used here as a simplified analog for L1 competence. For example, just because an individual is a fluent speaker of a language does not mean that they have any metalinguistic understanding of the language or the ability to teach it effectively.

<sup>39</sup> This does not include natural language variation.

#### 4.1.4. *Are affective benefits the most important goal?*

Many of the educators involved with endangered language education programs who were surveyed in Washington state (Ch. 3) commented on the affective benefits of a technological solution; saying things akin to ‘It would be cool to use tablets in the classroom’ or ‘It makes students feel good about seeing their language in a modern setting whether it’s online or tablet based.’ This purported benefit of ‘feel good’ and ‘cool’ technology should not be dismissed lightly, but should, instead, be weighed alongside the goals and possibilities available to a language program. For example, having a nice looking website may lead to youth improving their attitudes towards an endangered language and an increase in the overall presence of the language. However, is it technology for technology’s sake, or can such an effort have lasting effects on language attitudes and encourage learner effort? The question at hand is: Why use technology intended to support language *learning* for this purpose?

In other words, there are at least three different factors of interest here:

*Novelty*: a type of attitudinal effect that may be due to an individual’s initial exposure to a technology or due to a technology’s own unique or cutting-edge features in a specific context.

*Prestige*: how lower prestige languages may have their prestige raised when associated with a technology that has certain cultural appeal or evaluation (e.g., cool).

*Motivation*: the “...willingness to engage in a task...and/or to invest effort in a task...” that has been selected (Clark & Sugrue, 2012: 83).<sup>40</sup>

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<sup>40</sup> Educators in the Sahaptin language community who worked with children viewed motivation as being a highly valuable side effect of technology-based language tools (§6.7.8 & §6.9.2.3).

These three factors may intersect with each other, such that positive prestige effects may decrease in influence with each additional exposure as novelty dissipates. Before continuing this discussion, it should be noted that design features, including aesthetics, user interface and instructional design as they relate to cognitive load (Sweller, 1999) may have a strong effect on attitudes (Hughes, Mcavina & King, 2004). Having a delivery system for language learning content with well-designed aesthetics is a separate issue for solutions that are primarily focused on affective benefits, the latter of which is the topic of this section.

Clark & Sugrue (2012) suggest that motivation and attitudes stemming from a technology can vary substantially in short periods of time. Therefore, single-instance synchronic study results may be additionally problematic. Noting that the efficacy of a solution is dependent on the context, instructor attitudes towards technology are also worth keeping in mind.

Attitudes related to technology also seem to be dependent on students' perceptions (Clark, 2012; Salomon, 1984). Thus, associations of 'cool' and 'easy to use' (e.g., tablets are easier to use for learning than laptops or books) are largely subjective. If the attitudinal benefits associated with a solution are subject to novelty, the efficacy of the solution for that purpose may have a more limited term than expected. If the program is perceived to be problematic by the students (i.e., efficacy, user interface, etc.), as with the case of Raby's (2007) study of attitudes regarding a computer-based language learning system, then the positive attitudes it initially promoted may dissipate quickly as well. In addition, students' individual attitudes towards a program can vary widely over a period of time.

Ward (2004) presents a case study of a situation where computer-based activities were integrated into an Irish language program at two different schools. The focus of the study was on

possible changes in attitude for the students who used the computer-based software. While it shows that the students in general reported an increased interest in learning Irish because of the computer-based materials, the long term benefits or actual affects are not as evident. Clear data was not provided about how long the students used the program, or how the classroom context shaped their perspective or whether their attitudes changed over time.

A major question is how to separate the benefits and downsides of a given technological approach based on functionality or pedagogical effectiveness and not as technology simply for the sake of novelty.<sup>41</sup> Still, questions arising over a solution's effectiveness are often trumped by affective issues, likely because they are easier to observe or assess. Therefore, many people may be citing the benefits of using technology for education because of novelty, commercial interests, and occasionally, genuine success. Even issues of accessibility and distraction (e.g., books vs. e-books, or flashcards vs. e-flashcards) are more difficult to tease apart than they might appear at first.

If a medium or technological platform is liked or valued by students it may have an effect on motivation (Clark & Sugrue, 2012). However, it should be asked if the *liking* is also subject to novelty effects. A poorly designed instructional solution, even one implemented on a well-liked platform (e.g., a modern tablet computer), will be devalued with each use, and motivation would likely reduce as well.

If gains are due to a novelty effect, there may be a tendency for the affective benefits to diminish as students become more familiar with the new medium. Kulik, Bangert & Williams

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<sup>41</sup> As will be seen in the needs analysis data for the Yakama community (§6.7.9.3), it can be difficult to determine whether the interest in novel technology is due to assumptions about effectiveness, a 'cool' factor, or simply a frustration with failed, repetitive past attempts.

(1983) found that positive learning effects attributed to computer-based instruction for the secondary school level (grades 6 to 12) decreased over time. The longer the study went on, a further reduction in effect was observed. After approximately eight weeks, the effects had weakened significantly. Such a decrease is not inherent to all computer-based integration. An earlier meta-analysis on studies of computer-based teaching at the college level did not show signs of a novelty-related decrease over time (Kulik, Kulik & Cohen, 1980), although the age of the subjects seemed to be an important variable.<sup>42</sup> Technological novelty effects may not be entirely positive either, as it appears they may impair learning via distraction in certain contexts (Kubota & Olstad, 1991).

The available qualitative and quantitative research seems to argue that language associations with technology perceived as ‘cool’ may have a positive effect on language attitudes. In some instances, however, it may simply be that the technology in question is perceived as ‘cool’, while the language itself becomes an afterthought. Changing attitudes related to an endangered language is a significant task, and jumping on the bandwagon of technological fashion is only one, complicated, apparently limited, and temporary method for doing so.

In the end, if a primary goal is to improve language attitudes, one must ask, what will be the actual effects on the vitality of a language? If the solution primarily targets affective benefits, yet lacks linguistically rich information presented in pedagogically sound ways, it is likely not going to have much effect on acquisition of the language and, in turn, the vitality of the language. The intent here is not to argue that affective factors do not play an important role in revitalization. Instead, it is to suggest that if the goal is language revitalization, then the learning or acquisition

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<sup>42</sup> As one reviewer pointed out, computers were also more novel in general at that time.

of language must be of primary concern (Newman, 2003). Because the situation surrounding endangered languages is urgent, if ‘cool’ transference is a byproduct of association with technology, then it may be better to prioritize goals that can support the teaching, learning, or documentation of the language. After all, a solution that has linguistically rich and pedagogically sound content is in no way exclusive from one that has affective benefits. In fact, they can be highly complementary.

4.1.5. *Is there support for cross-discipline and cross-field collaboration and sharing?*

Technological learning solutions which support productive collaboration between language specialists (e.g., linguists), educators and endangered language community members should be prioritized (Ward & Genabith, 2003; Ward, 2004). Similarly, applications that help educators, while providing specialists with data that can, in turn, be used to create more pedagogically-sound content, should be utilized. If an educator creates content that they are willing to share, it should be archived, organized and shared with fellow educators. Online collaborative spaces can also promote collaboration with the goal of integrating more culturally robust content into the language learning materials (Hermes, Bang & Marin, 2012).

That being said, there are often impediments to effective collaboration. With the situation in North America there are, unfortunately, some divides between the endangered language communities and academia (Adley-SantaMaria, 1997), due to terrible events in the distant and recent past including the exploitation of community knowledge (Bentz, 1997; Brown, 2003; Harawira, 1999) and forced removal of children to boarding schools (Adams, 1995; McCarty, 1998). Because of these events and also because the definition of what is culturally sensitive and deserving of protection can differ greatly among people in an Indigenous community, it is

especially important that there is local control and oversight (Agbo, 2002; Deyhle & Swisher, 1997; NIB, 1975) and that content that is determined to be sensitive is properly secured (Villa, 2002). These issues are discussed further with respect to the Sahaptin language learning archive (§5.5 & §5.6.4) as Sahaptin language community members expressed strong and varying opinions (§6.7.3).

The ease of access to technology may in fact hinder specialist collaboration because of an underestimation of the need for expertise. The notion that dictionaries and grammars can be crowdsourced<sup>43</sup> without specialist moderation or substantial training is problematic, as sections 4.2.2 and 4.2.3 highlight. In addition to issues of consistency and general accuracy, how might various people who do not have detailed linguistic training in the language describe or analyze complex morphological words and dialect variation in a crowdsourced lexicon? Being able to accurately analyze and describe a language is a separate skill from being able to speak it. Adding to this is the fact that many people who consider themselves speakers of an endangered language vary wildly in their proficiency and understanding. This is not to suggest that community member input and oversight is not important, but contrary to common practice in the Pacific Northwest, collaboration with education researchers, anthropologists and linguists is a vital component for documentation and content development.

#### 4.1.6. *Is the content transferable?*

The next question concerns the avoidance of content lock (Cushion, 2004). This idea can be summarized as follows: If a solution is designed and content is integrated – as much content and organization as possible should be able to be extracted and easily migrated to a future

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<sup>43</sup> This is a principle some endangered language tools seem to support (e.g., FirstVoices).

platform. Because of the urgency of the situation for endangered languages (§4.2), there is limited time to make content, and remaking content should be avoided. Thus, all platforms that accept content *must* be able to easily export their data to a standard format. Some new coding schemes are more likely to be compatible, transferable and simple enough to be translated into future standard formats (e.g., XML (Ward, 2002) or CSV). Additionally, all created media should be archived in a secure place with appropriate documentation in a format that is lossless (e.g., AVI, BWF, FLAC, TIFF, EPS), metadata compatible (e.g., AIFF, BWF, FLAC) and cross-platform friendly (e.g., AVI, BWF, FLAC, TIF, EPS).

Technology and coding methods have changed substantially in the past ten years, especially when compared to the rate of change for most endangered languages. Endangered language learning programs should consider all technologically-based content development as an ongoing process with a goal of minimized attrition.

#### 4.1.7. *What is the assessment capability?*

There needs to be a means for assessing how effective a solution is in reaching its goals. This information can also be of value to other groups investigating similar options. If a goal is to increase the proficiency and knowledge of language learners, there should be functionality to assess any gains made by learners in ways which require minimal resource investment on the behalf of instructors or other individuals. In other words, automated assessment is ideal when applicable (e.g., vocabulary, multiple choice questions). When direct instructor assessment is required, functionality that streamlines the grading and feedback operation (e.g., by managing and hosting assignment submissions, providing the instructor a way to give feedback in the modality of their choosing) is very important.

Other valuable types of assessment include methods for learning how many people are using the system, the ways it is used and for how long (i.e., what is the completion rate and what might be affecting attrition (Tyler-Smith, 2006)?), the effectiveness of the individual content units for both instruction and assessment (i.e., do the questions effectively test the learner's knowledge?). Finally, better assessment can lead to improved content and pedagogy, in particular with scaffolding (§4.2.3).

#### 4.1.8. *What are the costs?*

The primary categories of interest here are costs related to time, finances and expertise. There is, of course, some potential overlap between those categories, but they are useful. Time can be thought of in a few ways: 1) *Lead time* = how long it will take to complete a project; 2) *Maintenance time* = the amount of time estimated to keep a solution up and running; and 3) *Urgency* = how soon a solution must be launched to meet a particular need and the ability to finish a project before it becomes obsolete.

Another concern is that expertise is often required for the creation or maintenance of a solution and time is often limited in that regard. Thus, the time and expertise associated with a solution and related content must be capitalized on. Because of limited resources in many communities associated with endangered languages, redoing work to accommodate each new technological platform should be avoided. If operating systems or supporting software for the application changes, the original developer or the endangered language community that inherited the application will have to dedicate resources to maintain it. Resources required for the maintenance of a redundant application could be better utilized for language documentation or material and content development.

A question that should be asked early on is, has someone done this already? It is never a good idea to reinvent the wheel (Ward & Genabith, 2003). Even if the resources are available, what is to be gained from developing something from scratch? Many pre-existing open source options offer a variety of features, including wide platform compatibility, a large support base and various solutions for securing content. As an example, current open source online learning management systems (LMS) (e.g., Moodle, Sakai, Canvas) can be utilized to integrate multiple applications for various pedagogical goals (e.g., writing, vocabulary, listening) into a single space for learners (Stockwell, 2007). However, if a group invests resources to develop their own flash card application for a specific endangered language for the latest device when there are pre-existing open source options that have external support, those resources that could have been utilized to develop new content would be largely wasted on reinventing the wheel again.

Content-related costs (§4.2.6) are another concern. After the initial development is completed, the content may require maintenance, such as improvements as well as organization if excessive amounts of content accumulate. Migration work for pre-existing content may also be required.

While the above discussion focused on the costs for a language program, school or other official entity, additional end-user costs should be considered (Ward, 2004). It is important to determine what for-cost hardware/infrastructure (e.g., mobile device, desktop, internet access) and software (e.g., OS, app suites) will be required to access the solution and content, and whether members of a target community can afford them. This concern exists in the Sahaptin language community context as classrooms and individuals generally lack the necessary hardware and infrastructure (§6.7.2).

#### 4.1.9. *Summary*

By looking at the work done by educators, specialists and researchers, it becomes evident that the long-term strategic integration of technology is important if endangered language learning is to be effectively supported. Deciding on a solution for language learning must be well-informed by language acquisition and learning research, especially starting at the most basic concepts, such as providing comprehensible linguistic content. It is vital that the chosen technology solutions allow the exporting of content to a standard format.

Many mainstream language learning technology companies make claims that are not supported by research, so it is expected that communities have been and will be contacted by groups and companies looking to work on a technology-based solution. While such groups may have the best interests of the community in mind, false promises and exaggerations can be made. For example, the following problematic and largely unsupported (by research) claims regarding acquisition are taken from a Rosetta Stone press release for their Iñupiaq software: “Rosetta Stone is a natural choice for language revitalization programs because it helps users develop everyday proficiency naturally, the same way people learn their first language — by associating new words with real-life meaning.” (Rosettastone.com, 2007) This statement is a substantial oversimplification of language acquisition and learning (§4.2.3.2) as it disregards any aspect of language other than lexical semantics.

With that background, the final sections of this chapter will present a solution to some of these issues in the short and long term. The proposal centers on the use of an LMS for the ongoing development and deployment of educational materials with rich linguistic content. At the same time, the system can provide space for the collaboration of various parties while

minimizing the cost burden on communities with limited resources. It is passive, relatively secure and modular. While the focus of the following proposal is on a pedagogical technological tool (e.g., an LMS) and is directly related to the online course module developed for Yakama described in Chapter 7, many of the earlier arguments are relevant to non-interactive technological solutions as well, as Chapter 5 describes the creation of an online archive that was developed according to the proposals laid out in this chapter.

#### 4.2. CASE COMPARISON

Most, if not all, endangered languages are at a disadvantage resource-wise when compared to more commonly-taught languages (e.g., Chinese, Spanish, German) with respect to access to abundant technological and traditional media-based resources with linguistically rich and pedagogically sound content. In addition, these commonly-taught languages, unlike many endangered languages in North America, have enormous populations of native (L1) speakers, positive prestige and communities that can offer students a variety of domains to practice their language. They also have substantial teacher training programs and pedagogical systems in place. Even so, these more commonly-taught language programs with plentiful resources only occasionally, and with great difficulty, produce fluent L2 speakers. This does not discount in any way the work done by educators and specialists for endangered languages. Instead, the point here is to emphasize that endangered language programs *must* utilize linguistically rich and pedagogically sound content in technological solutions if the goal is to revitalize the language or at least to produce some degree of fluency in the learners.

To illustrate the concepts discussed above, learning content developed for Korean, a less commonly-taught<sup>44</sup> language in the U.S., will be contrasted with North American Indigenous language materials. The primary material example for a North American language (Dakelh) is from the FirstVoices project website (FirstVoices, 2011). This review also touches upon the limitations of the crowdsourced language content found on this website created with minimal training for content producers and little to no collaboration with various experts (e.g., education researchers, linguists, etc.).

#### 4.2.1. *Korean at the University of Washington*

The Korean language program at the UW was founded in 1944 and is believed to be one of the earliest in the United States (Kim, 2012). Until the late 1990s it primarily served heritage learners, but after the arrival of Dr. Soohee Kim to the department in 1999 the program was split into a dual track model, adding courses specifically designed for non-heritage students. The department has continued to grow and boasts many highly proficient graduates from both the heritage and non-heritage tracks. While the pedagogical focus of the program is classroom and textbook based, at the time of this analysis the program incorporated some online hybrid style speaking practice and practice quizzes using an LMS.

The Korean examples below are taken from the first two volumes of the textbooks used at the UW (Kim, Curtis & Cho, 2003). Kim and Cho both have Korean as their L1 and all of the authors have graduate degrees in linguistics and strong pedagogical backgrounds as well. The training in linguistics and education supported them in the development of a textbook with content that is both *linguistically rich* and *pedagogically sound*.

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<sup>44</sup> Korean is comparably higher-resourced than all Indigenous languages in Washington state, and arguably North America.

To provide context, nearly every topic covered in the Korean textbook is followed by examples, practice exercises, as well as additional exercises in an accompanying workbook, and associated media files that may be accessed online. The first volume of the textbook series begins with some basic classroom phrases which are glossed for pronunciation using English. This is followed by a tutorial on the orthographic system. Next, the authors guide the students through a few core phonological rules using lay language. These include syllable coda consonant cluster reduction, aspiration of consonants preceding glottal fricatives, and various assimilation processes. Some simplified songs and poems are used to demonstrate these principles and provide additional input. Following an associated vocabulary list, the first grammar lesson introduces the subject marker and the verbs for “there is x” and “there is no x” in the present tense. Figure 5 below provides a few excerpts from this section. In (a), the most basic translation of the structure is provided. Then the authors provide substantial metalinguistic explanations for the core grammar (b). A side note is provided in (c) to provide learners with some very basic metalinguistic information which they could use as scaffolding. The metalinguistic explanation is followed by complete sentence examples in both Korean and English (d). (e) is an explanation of the morphological and phonological process of the subject marker. The explanation and examples continue beyond what is included below and increase in both complexity and explicitness, ending with a short discussion of pragmatics and subject marker drop.


Figure 5 Excerpt from Korean grammar introduction lesson (Kim et al., 2003: 62)

Lesson 1 grammar

**1. Focus** **there is / there is no**




A 이/가 있어요	there is A
A 이/가 없어요	there is no A



In this first lesson, you should learn two important points about basic sentence structure in Korean. The first is that the **verb** always comes **last** in a Korean sentence. The second is that other parts of the sentence, like the *subject* and the *object* of the *verb*, as well as location words, have a special **suffix-like marker** whose function is to indicate the grammatical role (*Subject*, etc.) of the noun it attaches to.

Languages tend to have a special way of expressing the concept of simple existence, such as the English expression *there is/there are*. In Korean, the verb **있어요** expresses existence (it means *exists* or *there is*) and the verb **없어요** expresses a lack (*there is no*), or, the opposite of **있어요**. Both verbs can be used regardless of the number of items in existence (or lacking). Since they are verbs, they come at the end of the sentence.

 Since **있어요** and **없어요** are **verbs**, the items in existence or lacking are their (grammatical) **subjects**:

“시험이 있어요” is literally *A test exists*, which is parallel to *A boy cried.*, *My dog eats.* – all have a **subject** + **verb** structure (in English and Korean).

**Subjects** in Korean are marked with **-이**, when they end in a consonant, like 시험, and with **-가** when they end in a vowel, like 의자. So we say the subject marker is **-이/가**.

Talking about grammar and grammatical **Subject of the verb**, the **Subject** is the noun that *does* the action communicated by the verb.

Further on, the same introductory chapter presents a single wh-word (what) and a single adverb (tomorrow) which are used to practice subject markers (e.g., “What is tomorrow?” / “There is a test tomorrow?”). At the same time, these examples provide some basic input that is supported by metalinguistic explanations regarding basic word order restrictions for adverbs and wh-words. The final grammar point of the chapter is the location postposition for “in, at, on”.

Thus, in the first chapter the authors provide a solid grammatical foundation with an existential verb, a subject marker, an adverb, a wh-word, and a postposition, in addition to extensive vocabulary and phonology. The content is also presented using vocabulary and task types associated with the classroom, which is likely the dominant communicative context relevant to the learner at this point. All of the grammar points have multiple corresponding examples and exercises of increasing complexity. Worth noting is the integration of the vocabulary and phrases presented to the learner within the grammatical examples and explanations. As the book progresses, the authors control the amount of new vocabulary and grammar presented to the learner such that it builds on and reviews content that the learners were exposed to in prior chapters. In other words, the text is organized according to the expected proficiency of the learner at each point.

Earlier in section 4.2.3, metalinguistic explicitness was introduced as a tool that can be used to scaffold learners and more advanced language tasks. Below, some Korean learning content will be used to frame a discussion of the following: 1) the idea of metalinguistic explicitness; 2) problems with relying on phrases and discovery learning and; 3) the need to understand the learner’s abilities and the target task (§4.2.3.2). (1a) is an example of Korean presented with no explicit metalinguistic information to scaffold the input to the learner, while

(1b) includes additional explicit metalinguistic information on morphology, syntax and phonology. (1a), which consists of only two words, may at first appear to be a fairly simple string of language that would be comprehensible to most beginners. A common English translation would be, “You speak Korean!”, yet if the metalinguistic content is reviewed (b) some semantic and pragmatic information is lost in the translation. In particular, both the honorific morpheme (“si”) and the politeness marker (“yo”) are not transferred into written English. Next, there is no overt subject in the sentence. Subject and pronoun drop are not common in English, except for in imperatives. It is possible that the learner will mistakenly interpret the English translation of this sentence as being imperative, although admittedly, such a reading is not very felicitous without a comma following the second person singular pronoun. In Korean, subject and pronoun drop have a degree of complexity such that learning through discovery (i.e., no explicit training or rules provided to the learner) would require a fair amount of comprehensible input to develop and counter misconceptions. The honorific marker also has discourse constraints whereby it is only used when the subject is being honored. If someone were to memorize this phrase and speak it to someone much younger than them it would be culturally unnatural. It could be additionally strange because of the politeness marker depending on the relationship between the speaker and the audience. If a learner modified the phrase by adding an overt first person pronoun as the subject, the sentence would be both strange and boastful. In addition to the pragmatic and semantic complexities of these two morphemes they also interact with and complicate other morphological processes (e.g., the suffixation of the past tense morpheme) and orderings. The accusative marker (“eul”) provides an example of a phonological rule that is not explicit, even in (b). If the syllable to which the accusative marker suffixes ends

in a consonant the marker is realized with a syllable-initial alveolar liquid (“leul”), otherwise, as in (b) below, it is with an “empty” consonant (i.e., the Hangul character <ㅇ>).

(1) *Example of explicit metalinguistic content*

- a) 한국말을 하시네요
- b) 한국말을                    하시네요  
 Hanguk-mal-eul            ha-si-ne-yo  
 Korea-language-ACC do-HON-surprise-POL(1)  
 “You speak Korean!”

The description above is intended to illustrate the complexity of linguistic information even a short utterance can contain, and to show how metalinguistic explicitness can be used to either simply present information or to scaffold a learner with relevant information.

A language, any language, is a complex system. It is not the case that learning a translation for a lexical item in another language will always provide the information necessary to use that lexical item fluently. At its simplest, lexical entries may have multiple direct lexical translations (e.g., the English verb *to ball*), but the rules governing interaction between lexical items, including the syntax, are integral and cannot be ignored if a learner wishes to be fluent. To provide one example of the complexity surrounding a single lexical item an excerpt from the second volume of the same Korean textbook series (Kim, Curtis, & Cho, 2004: 89) has been included in Figure 6, below. The excerpt discusses the Korean verb  $\text{ㄷ}\text{웨}\text{다}$  [dweda], which might be translated in English as, ‘to become’. It should be noted that this excerpt is truncated and only represents about 30% of the content provided on the verb  $\text{ㄷ}\text{웨}\text{다}$  [dweda] provided in the textbook in question. The amount of syntactic, semantic, phonological and pragmatic information

contained in Figure 6's single "grammatical" topic, which could be thought of as a single and simple lexical item, highlights the hazards of ignoring the natural complexity of language.

Figure 6 Sample Korean grammar explanation

### 1. 되다 *become, be suitable, be satisfactory, be sufficient, 'will do,' be allowed*

If you asked native Korean speakers what the word “되다” means in Korean, they would say, without hesitation, that it means “to become”. The written conjugation form of 되다 is 되어요, but you will see the contracted form 돼요 (just like the first syllable of the word *pig* 돼지), and no one says 되어요 in spoken Korean.

The verb 되다, when it means *become* (in the sense of *turn into*), is typically used in the “formula” X (has) become Y. How you say this in Korean is very interesting:

X 이/가	Y 이/가	돼요/됐어요.
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물이 얼음이 되었어요.                      Water has turned into ice.

Since the first noun is usually a topic one discusses, what you will see more often is the first noun with topic marker 은/는:

(X 은/는)	Y 이/가	돼요/됐어요.
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이번 학기에 저는 3 학년이 됐어요.      I have become a junior this quarter.

너는 커서 뭐가 될래?                      What do you want to be when you grow up?

그 아이는 어른이 되었어요.              The child has turned into an adult.

Or, when the first noun would be an “empty” *it* in English, the whole noun is omitted:

점심 시간이 되었어요.                      It's become lunchtime.

You will see *idiomatic* uses of 되다 far more frequently during your Korean learning career:

안돼요!    No way! No can do! You shouldn't!

이거 안 돼요!                                  This isn't working. I can't get it to work.

다 됐어요.                                        It's all done/finished.

거의 다 돼 가요.                              It's getting there. Almost finished.

한국 사람 다 됐네요.                        You are so Koreanized! (very Korean!)

마침 잘 됐어요.                                It hits the spot. Just in time.

아직 때가 안 됐어요.                        It's not time yet.

The Korean textbook series provides an exceptional amount of information to the learner and provides abundant resources for practice, as well as input and output via various modalities.

#### 4.2.2. *Dakelh on FirstVoices*

The FirstVoices Project, based in British Columbia, Canada, is an interesting example of how technology can support endangered languages on a larger regional scale. Project development was started in 2001 (Hodgson, 2012) and the initial site was launched in 2003 (B.C. Ministry of Community, 2005). The project was a true pioneer for crowdsourcing, making considerable progress on the collection of video, audio, imagery and text for archival and education purposes (Hansen, 2008). The time and resources dedicated to the project also serves as an example of some of the risks of crowdsourcing as well. It has been suggested that this project also has an affective benefit (§4.2.4), since it establishes local control of language documentation and archiving by having community leaders guide the process (Moore & Hennessy, 2006). The system currently offers content for over seventy languages Indigenous to Canada and one Indigenous to Australia.

FirstVoices consists of a main website, a FirstVoices Language Tutor and a youth oriented site called, FirstVoices Kids. The archive consists of fonts and keyboards, lexical items, songs, stories, phrases (text and audio), and images supplied mostly by community members, much of which can be accessed by the public from the main site. The same database is used to populate a suite of games (e.g., word search) with content.<sup>45</sup>

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<sup>45</sup> This functionality is not limited to Dakelh. All languages in the system can use these features.

The following content is taken from a few language lessons for Dakelh, also known as Carrier. There are lessons preceding the content that will be discussed below. These preceding lessons cover topics such as the orthographical system, basic numbers, colors, combining phrases and cultural topics. Some lessons have accompanying audio and/or video of a speaker saying the phrase. There is a general absence of explicit grammar instruction for the series of lessons.<sup>46</sup> The assessment capability is limited to confirmation of whether the learner loaded each slide or page, multimedia multiple choice questions, and self-assessed audio recordings. Figure 7 is a panel from a lesson that uses some phrases which might be comprehensible to some novice learners. While the language in this panel is relatively simple, other panels in the lesson do not provide an imperfective verb as in Figure 7 and instead utilize some of the following: future or progressive verb, indirect and direct objects, locatives, adverbials, etc.

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<sup>46</sup> This is an example of how phrases and complex lexical items are commonly presented in North American Indigenous language materials with no explicitness beyond English translations at the phrasal or lexical level. In addition, the morphology, semantics, syntax and phonology of the phrases that will be reviewed vary in ways that make isolating information via the discovery method even less feasible than usual.

Figure 7 Nak'azdli-Dakelh Language lesson example – “School date”



Figure 8 is taken from part one of a three part lesson dealing with tanning a moose hide. The Dakelh language content examples in Figure 8 include accompanying audio files of each phrase so the learner has access to some lexical and some phonological information. Clearly, the media and cultural content is well done, but the language content is complicated in a few ways. First of all, the online lesson as it stands is lacking any explicit grammatical information and there is only very limited phonological information. Secondly, while there is some scaffolding in the form of the English translation, it is only at the sentential and not the lexical or morphemic level. Beginning learners working through the course would likely not find much of this content to be comprehensible.

Figure 8 Nak'azdli-Dakelh Language lesson example – Moose hide first panels.<sup>47</sup>



a)



b)

<sup>47</sup> [http://publish.myudutu.com/published/courses/1360/Course2787/v2010\\_6\\_14\\_10\\_9\\_27/course/course2787.html](http://publish.myudutu.com/published/courses/1360/Course2787/v2010_6_14_10_9_27/course/course2787.html)

These two figures were selected simply because they are the first two panels a learner would be presented with.

Incomplete or incorrect metalinguistic information, even at the level of an individual lexeme, can provide substantial challenges to learners with little general linguistic training. For example, *'Udechoo* is translated as 'first' and *Ilhoh* is translated 'for the first time' in Antoine et al. (1974), but in Figure 8a both are translated as the number '1' in Figure 8a. In Figure 8b, the English translation uses the second person pronoun 'you', but the '-s-' morpheme in the verb indicates a first person singular subject. Thus the translation should be: 'Materials that I will need.'<sup>48</sup> Such errors may lead learners using the discovery method to make incorrect assumptions about the language that will take additional effort and input to correct.

Figure 9 is an example of a panel that is presented to the learner part way through the same lesson. The level of grammatical complexity of the English translation is considerable compared to that of Figure 8a. At this point in the series of lessons, the learners would not have been exposed to any substantial explicit information on the basic word order for the Nak'azdli dialect of Dakelh, not to mention complicated constructions like relative clauses. Without the aid of an adequate lexicon, a beginning learner would likely not be able to even identify which word in the sentence corresponds to the English word 'ax'.<sup>49</sup>

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<sup>48</sup> Sharon Hargus, personal communication.

<sup>49</sup> Antoine et al (1974) provides the following translations for lexical items in the Figure 9 below: *ndet* 'when, where'; *ndet lah* 'whenever'; *tsetselh* 'ax'; *be* 'with it'. However, *lhuniduntiht'o-un* and *hanuwulhtselh* do not appear in Antoine et al. Hargus (p.c.) suggests that *lhuniduntiht'o-un* might be glossed 'person who nails' and *hanuwulhtselh* might be glossed 'he/she is chopping up', respectively. A closer translation of the sentence might thus be 'there the one who is nailing together is chopping with an axe'. *la* is not listed in Antoine et al (1974) but Hargus (p.c.) notes that in neighboring languages it is an evidential morpheme.

Figure 9 Nak'azdli-Dakelh Language lesson example – Moose hide middle panel



Based on the survey of materials done for this project<sup>50</sup>, including the Dakelh examples above, content that is intended to instruct linguistic functions such as syntax, morphology, semantics, etc., appears to be often absent from technologically-based learning materials for many endangered languages in the Northwest of North America. The examples above have shown that even in cases where the content may be grammatically rich, the absence of scaffolding and explicitness may seriously hinder the effectiveness of the learning materials. It is debatable to what degree this absence is due to limited documentation (especially grammars

<sup>50</sup> As preparation for this project I reviewed many technology-based solutions for learning Indigenous languages. Many were online, but others included CD based software, smart phone applications, and other formats. It was not possible to do a complete audit due to limited access and time, but more than 30 solutions were reviewed.

written for non-linguists), an overemphasis on communicative functions, an overemphasis on cultural education in language classes (§3.2), a belief that grammar and other linguistic areas of a language are not important, or that learners will acquire those rules and skills through a discovery method. The latter of these possibilities was problematized in section 4.2.3.2. Regardless, it is clear that many endangered language learning systems deliver content that almost solely utilizes unanalyzable phrasal chunks and word lists, with no instruction on how to creatively form or parse new utterances.

The amount and accuracy of phrasal and lexical content is another issue in these kinds of materials. In the next few paragraphs, I will attempt to reconstruct the complexity a learner may face when utilizing resources with content that lacks or has inconsistent and even incorrect metalinguistic information. The following example is taken from the crowdsourced learning resources for the same language on the FirstVoices Project website. Figure 10, below, is an example of a lexical entry that only learners who already have a fairly strong grasp of the language will be able to glean key information from without considerable effort.

Figure 10 Nak'azdli-Dakelh dictionary entry for *buba hanghan* 'killed'.<sup>51</sup>

The screenshot shows the 'FirstVoices' website interface. At the top, there are navigation links for 'HOME', 'Choose A Language', and 'GAMES'. The main header is 'FirstVoices' in a stylized font, with a sub-header 'Nak'azdli Dakelh words'. On the left side, there are navigation menus for 'Words', 'Phrases', 'Songs', and 'Stories', each with sub-links like 'List Alphabetically', 'List by Category', 'Search', 'List by Phrase book', and 'Search'. Below these menus is a small illustration of a wolf and a tree. At the bottom left, there are links for 'Return to Portal Page' and 'Return to Welcome Page'. The main content area on the right displays the dictionary entry for 'buba hanghan'. It includes the word in Nak'azdli Dakelh, its English translation 'killed', and its part of speech 'Verb'. There are also sample sentences in both languages and a cultural note.

**Words**  
[List Alphabetically](#)  
[List by Category](#)  
[Search](#)

**Phrases**  
[List by Phrase book](#)  
[Search](#)

**Songs**  
**Stories**



[Return to Portal Page](#)  
[Return to Welcome Page](#)

**Nak'azdli Dakelh**  
 buba hanghan bu•ba han•ghan

Category	PART OF SPEECH
Events - states	Verb

**English**  
 killed

**LITERAL TRANSLATION**

**Nak'azdli Dakelh SAMPLE SENTENCE**  
 Yus lhai sulí, 'ank'wus ts'iyawh buba hanghan.

**English SAMPLE SENTENCE**  
 There were lots of wolves, they almost killed them all.

**CULTURAL NOTE**  
 verb root -ghan

**Multimedia File Information**  
 Elder Catherine Coldwell  
 Nak'azdli Dakelh Database Export  
 Audio  
 Voice: Elder Catherine Coldwell

Now let us consider how a beginning learner with some linguistic knowledge might parse the information provided in Figure 10.<sup>52</sup> *Buba hanghan* is translated as 'killed'. The cultural note

<sup>51</sup> There are accompanying audio files in the right column for each of these entries. However, in order to make the fonts more readable in this dissertation the screen capture images have been cropped on the right hand side.

<sup>52</sup> No metalinguistic content related to semantics, syntax, phonology or morphology is provided on the website.

correctly lists *-ghan* as the verb root (verbs are bound morphemes in Dakelh). But instead of providing the verbal morpheme for ‘kill’ (i.e., *-ghan*)<sup>53</sup> the lexicon provides a phrase that is marked for tense and omits the English translation for *buba*.

Turning to other content in the same lexicon, Figure 11 shows the entry for the word ‘buba’, which is listed in the category of prepositions<sup>54</sup>, but in the same entry its part of speech is listed as being ‘Particle – Postposition’.<sup>55</sup> *buba* is translated ‘for them’, but it is not clear if the third person plural is actually part of the postposition, a separate but unmarked morpheme, or if it is intended to imply an epicene interpretation (e.g., for someone/some thing/some group).<sup>56</sup>

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<sup>53</sup> *-ghan* should be translated as ‘kill (pl.)’ (Hargus, p.c.), but this information could not be found in the online dictionary.

<sup>54</sup> The systemwide category of prepositions is limiting. The term adpositions would be a more suitable label.

<sup>55</sup> <http://www.firstvoices.com/en/Nakazdli-Dakelh/word/4340fac364f74eb2/for+them>

<sup>56</sup> *bu-* marks the 3sg object of postposition. *hubu-* marks the 3pl object of postposition, but the plural marking is generally reserved for human plural. (Hargus, p.c.)

Figure 11 Nak'azdli-Dakelh dictionary entry for *buba* 'for them'

The screenshot shows a web page titled "FirstVoices" with a red header. Below the header is a yellow bar with the text "Nak'azdli Dakelh words". The page is divided into a left sidebar and a main content area. The sidebar contains navigation links for "Words", "Phrases", "Songs", and "Stories", each with sub-links for "List Alphabetically", "List by Category", "Search", "List by Phrase book", and "Search". There is also a yellow square icon with a red design and two links: "Return to Portal Page" and "Return to Welcome Page". The main content area displays the dictionary entry for "buba bu'ba". It includes sections for "Nak'azdli Dakelh", "Category" (PREPOSITIONS), "PART OF SPEECH" (Particle - Postposition), "English" (for them), "LITERAL TRANSLATION", "Nak'azdli Dakelh SAMPLE SENTENCE" ('Uhi'en hukw'el haz buba 'uk'elha whutaleh.), "English SAMPLE SENTENCE" (After they have worked payment will be made for them.), "CULTURAL NOTE", and "Multimedia File Information" (Elder Catherine Coldwell, Nak'azdli Dakelh Database Export, Audio, Voice: Elder Catherine Coldwell).

Similarly, in Figure 12 the word *buka* is listed in the same category and part-of-speech as *buba* and is also given the same English translation, namely 'for them'. However, when the example translation sentences for *buba* (e.g., 'After they have worked payment will be made for them.') and *buka* (e.g., 'The woman came for her children.') are compared, it appears there are small semantic differences.

Figure 12 Nak'azdli-Dakelh dictionary entry for *buka* 'for them'

The screenshot shows the 'FirstVoices' website interface. At the top, there is a red banner with the 'FirstVoices' logo in white. Below the banner is a yellow bar with the text 'Nak'azdli Dakelh words'. The main content area is divided into two columns. The left column contains navigation links: 'Words' (List Alphabetically, List by Category, Search), 'Phrases' (List by Phrase book, Search), 'Songs', and 'Stories'. Below these links is a small yellow square icon with a red horse and a tree. At the bottom of the left column are two links: 'Return to Portal Page' and 'Return to Welcome Page'. The right column displays the dictionary entry for 'buka'. It starts with the word 'buka bu•ka' under the heading 'Nak'azdli Dakelh'. Below this is a table with two columns: 'Category' and 'PART OF SPEECH'. The 'Category' is 'PREPOSITIONS' and the 'PART OF SPEECH' is 'Particle - Postposition'. Under the 'English' heading, the translation is 'for them'. Below this is a section for 'LITERAL TRANSLATION', which is currently empty. Next is a section for 'Nak'azdli Dakelh SAMPLE SENTENCE' with the example 'Ts'eke duzkeh buka whusainya.'. This is followed by an 'English SAMPLE SENTENCE' section with the example 'The woman came for her children.'. Below that is a 'CULTURAL NOTE' section, which is also empty. At the bottom of the right column is a 'Multimedia File Information' section, which lists 'Elder Catherine Coldwell' as the creator, 'Nak'azdli Dakelh Database Export' as the source, and 'Audio' as the format. The voice is identified as 'Elder Catherine Coldwell'.

Figure 13 shows one of the entries<sup>57</sup> for *ba*, which translates it as 'for', but its category is not 'Prepositions' —it is 'Events – states'.<sup>58</sup> After reviewing more of the provided lexical items it seems likely that *bu-* is a prefix marking the third person singular (as it is in (Antoine et al.,

<sup>57</sup> The other entry translates *ba* as 'edge', with its category being 'Nature / Environment - place/location' and its part of speech 'Particle – Postposition'. (<http://www.firstvoices.com/en/Nakazdli-Dakelh/word/032c2b767f37ac17/edge>)

<sup>58</sup> <http://www.firstvoices.com/en/Nakazdli-Dakelh/word/6c699b03133abd5a/for>

1974)), although in another lexicon entry, *buba k'elháwhulhtsi* is translated as ‘he is paying them’ and is listed as part of the category ‘Events – states’, further complicating the matter.

Figure 13 Nak'azdli-Dakelh dictionary entry for *ba* ‘for’

FirstVoices

Nak'azdli Dakelh words

<p>Words</p> <ul style="list-style-type: none"> <li><a href="#">List Alphabetically</a></li> <li><a href="#">List by Category</a></li> <li><a href="#">Search</a></li> </ul> <p>Phrases</p> <ul style="list-style-type: none"> <li><a href="#">List by Phrase book</a></li> <li><a href="#">Search</a></li> </ul> <p><a href="#">Songs</a></p> <p><a href="#">Stories</a></p> <div style="text-align: center;">  </div> <p><a href="#">Return to Portal Page</a></p> <p><a href="#">Return to Welcome Page</a></p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">Nak'azdli Dakelh</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">ba ba</td> </tr> <tr> <td style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">Category</td> <td style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">PART OF SPEECH</td> </tr> <tr> <td style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">Events - states</td> <td style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">Particle - Postposition</td> </tr> <tr> <td colspan="2" style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">English</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">for</td> </tr> <tr> <td colspan="2" style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">LITERAL TRANSLATION</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;"> </td> </tr> <tr> <td colspan="2" style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">Nak'azdli Dakelh SAMPLE SENTENCE</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">Sooniya 'en ba 'unt'oh.</td> </tr> <tr> <td colspan="2" style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">English SAMPLE SENTENCE</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">The money is for him.</td> </tr> <tr> <td colspan="2" style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">CULTURAL NOTE</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;"> </td> </tr> <tr> <td colspan="2" style="background-color: #e6f2e6; border: 1px solid #ccc; padding: 2px;">Multimedia File Information</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">Elder Mildred Martin</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">Nak'azdli Dakelh Database Export</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">Audio</td> </tr> <tr> <td colspan="2" style="background-color: #fff9c4; border: 1px solid #ccc; padding: 2px;">Voice: Elder Mildred Martin</td> </tr> </table>	Nak'azdli Dakelh		ba ba		Category	PART OF SPEECH	Events - states	Particle - Postposition	English		for		LITERAL TRANSLATION				Nak'azdli Dakelh SAMPLE SENTENCE		Sooniya 'en ba 'unt'oh.		English SAMPLE SENTENCE		The money is for him.		CULTURAL NOTE				Multimedia File Information		Elder Mildred Martin		Nak'azdli Dakelh Database Export		Audio		Voice: Elder Mildred Martin	
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Audio																																							
Voice: Elder Mildred Martin																																							

This harkens to the obvious problem that phrases are listed as lexemes in this resource. The ‘cultural note’ for the entry *buba k'elháwhulhtsi*, seen in Figure 14 above, lists the verb root

as *-lhtsi*. The verb appears to be marked for the imperfective.<sup>59</sup> Similarly, if *ba* is also being used here as ‘for’, and *bu-* as ‘them’ it further complicates the English translation.

Figure 14 Nak'azdli-Dakelh dictionary entry for *buba k'elháwhulhtsi*, ‘he is paying them’

The screenshot shows a web interface for the FirstVoices Nak'azdli-Dakelh dictionary. The page has a red header with the 'FirstVoices' logo and a yellow sub-header 'Nak'azdli Dakelh words'. On the left side, there are navigation links for 'Words', 'Phrases', 'Songs', and 'Stories', each with sub-links for 'List Alphabetically', 'List by Category', 'Search', 'List by Phrase book', and 'Search'. Below these links is a yellow square icon with a red figure and musical notes. At the bottom left, there are links to 'Return to Portal Page' and 'Return to Welcome Page'. The main content area on the right is divided into several sections: 'Nak'azdli Dakelh' (showing the word 'buba k'elháwhulhtsi' and its phonetic transcription 'bu•bá k'e•lhá•whulh•tsi'), 'Category' (Events - states) and 'PART OF SPEECH' (Verb), 'English' (he is paying them), 'LITERAL TRANSLATION', 'Nak'azdli Dakelh SAMPLE SENTENCE' (Moodih bubá k'elháwhulhtsi.), 'English SAMPLE SENTENCE' (The boss is paying them.), 'CULTURAL NOTE' (verb root -lhtsi), and 'Multimedia File Information' (Elder Mildred Martin, Nak'azdli Dakelh Database Export, Audio, Voice: Elder Mildred Martin).

This illustrates how difficult it is for learners to receive any effective language input from limited metalinguistic content using the discovery method. Even learners who approach the content with

<sup>59</sup> Hargus (p.c.)

some degree of fluency may find considerable inconsistencies and contradictions. If we contrast the Korean example in Figure 6 with the examples from FirstVoices, above, it becomes even more evident that the limited and incorrect lexical entries in the Nak'azdli-Dakelh FirstVoices dictionary would be problematic for a learner.

Finally, the project illustrates some complications that can arise when integrating documentation and pedagogical functionality into the same system. There is no inherent problem with combining functionality for documentation with pedagogy into a single system, but most systems that are designed for documentation lack the functionality for pedagogical presentation, and vice versa. While text related to 'language learning' is present on the various FirstVoices sites, there seems to be a complete absence of grammar in the archive. In fact, apparently the only item labeled 'grammar' on the main FirstVoices site, not simply the Dakelh materials, was a PDF formatted article on an introduction to the Witsuwit'en (a language closely related to Dakelh) alphabet and phonology. The PDF is a summary of a lesson from Hargus (2002). Except for the age division between the youth-oriented site and the main site, there also appears to be little to no scaffolding of the materials. The material consists mainly of raw phrases (i.e., lacking any metalinguistic description), lexical items and cultural information. While all of these have some value as a tool to support language learning, for individuals who do not have access to a classroom or other pedagogy such materials must be opaque to the learner, compared to other systems.

#### 4.2.3. *Summary*

The language learning materials just presented by Korean and Dakelh are compared in Table 1 with respect to the questions raised in §4.2. The goals for both resources differ slightly in

that the Korean resources are focused on producing learners with a certain degree of fluency, while FirstVoices takes the broader approach of supporting other efforts. The linguistic content for Korean is much more extensive and represents a broader range of linguistic forms. For FirstVoices, there are a few texts and lexical items for most languages, but there is a nearly complete lack of grammar and continuity such that scaffolding and lesson transitions with the content will be hindered. Both resources utilized audio, images and text. As for the question of pedagogy, the Korean textbooks provide comparatively smooth scaffolding for learners. There are extensive metalinguistic details provided to support self-study learners or supplement class-based instruction. There are also online exercises and audio resources that tie into the lessons. For FirstVoices, the lessons are largely disconnected and there is minimal if any scaffolding. Other resources, such as the lexicons, are not tied into the online lessons, and many lexical items are missing or incorrect. However, standalone lessons on FirstVoices could be integrated into a classroom to supplement the learning content. Affective benefits were apparently not a primary goal for the Korean textbooks, but they are utilized for heritage learners, which may have a lower prestige value for the language. Affective benefits seem to be one of the more dominant traits of the FirstVoices system, with an emphasis on community involvement. For many of the languages represented on the system, at the time of the launch of FirstVoices, the Dakelh page on FirstVoices may have been one of the few, if not the only, online representation of the language, which can be a very positive asset. As for collaboration, the authors of the Korean textbook brought to the project a variety of valuable specializations (e.g., linguistics, general education). Some collaboration has continued since publication with the University of Washington Language Learning Center to develop new online and media resources to supplement the text. FirstVoices provides the means for crowd-sourced content, with minimal functionality for system-based

moderation. While the core collaborative model is valuable, there appears to be very little collaboration between people on the system and with specialists outside of the community. The content longevity of the Korean textbooks is problematic as they were created using desktop publishing software that is now outdated, so some effort is required to transfer them to a more modern software (e.g., Adobe InDesign). As a positive, the majority of the media has been archived in an uncompressed format. FirstVoices, as mentioned earlier, uses MySQL for its database back-end. This will be highly beneficial for transitioning the majority of the data to a future system. Some of the audio materials are encoded using the outdated QuickTime format, so the ease of lossless transition to future formats is dependent upon the availability of the individual resources in an uncompressed format. The majority of the lessons utilized Adobe Flash, which is also becoming out of date and may pose a substantial challenge for migration. Of all of the resources in the system, these are at the greatest risk of content lock. The assessment potential for the Korean textbook is limited to instructor moderation or self-checked workbook exercises for exercises that can have answer keys (e.g., not essays). The FirstVoices assessment options are essentially limited to the short quizzes and do not relate to any scaffolding functionality. The general costs for the creation and maintenance of the Korean learning resources and FirstVoices system seem to be relatively comparable, but the exact details are unknown. While the FirstVoices project has limited content for each language, it does support many languages with its budget. For students, the costs for the Korean textbooks are slightly higher than the free FirstVoices system.

Table 1 Comparison of the Korean and Dakelh learning materials

	Korean at UW	Dakelh on FV
Goals	Produce fluent L2 learners	"...support Aboriginal people engaged in language archiving, language teaching & culture revitalization..." (FirstVoices, 2011)
Content	Four textbooks and workbooks suitable for at least two years of University level study with either heritage or non-heritage students, audio materials	Texts, vocabulary, sentences, audio, images
Pedagogy	+Can be integrated into a classroom or used for self-study, online hybrid content (e.g., vocabulary and speaking practice)	+/-Web-based lexicon, tutor materials may be integrated with classroom instruction
Affective benefits	+Representation and education for heritage learners at the university level	+Online representation and local involvement in content creation
Collaboration	+Linguists, program coordinator, classroom teachers, Language Learning Center	+Crowd-sourced, but minimal specialist involvement
Content longevity	-Textbook and workbook were constructed using desktop publishing software. +Online materials are archived in an uncompressed format	+Database driven, -Some outdated formats (e.g., Flash, QuickTime)
Assessment	+There is assessment of the instructor, of the students and of the content	-Minimal assessment (for the FirstVoices Tutor quizzes)
Costs for the program	UW salaries	First People's Cultural Council salaries and technical support
Costs for the students	Computer for accessing online materials (optional), textbook (\$40) and workbook (\$21) costs, tuition	Computer for accessing materials (optional)

Relying on poorly documented phrases and lexical items for educational materials is a pressing concern. Though providing limited, incomplete and incorrect grammatical information to learners and/or asking learners to translate phrases and sentences far beyond their level may provide some useful input (e.g., phonological, orthographical), it will likely elicit boredom, frustration and other negative effects (§4.2.3 & 4.2.4) and will stifle language learning. If there is a recording, the input to the learner will be largely sound, not meaning. On the other hand, as mentioned above, learners may receive incorrect input or parse input incorrectly, which may be detrimental to their learning process if it is not buffered by either a clear metalinguistic explanation or plentiful linguistically robust and accurate input. Such a situation defeats the often cited purpose for integrating technology with language learning content (§4.2.4), which is to support the learning of a language.

Not that all pedagogical content must be in the form of explicit metalinguistic information. In some cases, an explicit explanation may be suitable (e.g., (Adjective Noun Postposition) = Simplified Korean Noun phrase structure) while in others it may exceed the needs or expertise of the learner (e.g., In passive constructions the object DP undergoes A-bar movement to the specifier position in TP...). Neither am I suggesting that the communicative function of language should not be prioritized. Instead, following the research reviewed in sections 4.2.2 & 4.2.3 above, what is crucial is that all content having an underlying element of linguistic richness be organized in a way that reflects a thorough linguistic understanding of the content, and be presented along a spectrum ranging from implicit to explicit, depending on the perceived needs of the learners.

### 4.3. PROPOSED MODEL

In this section I propose a model which utilizes an LMS to promote the ongoing development and deployment of educational materials with linguistically rich content by providing a space for collaboration of various parties while minimizing the cost burden on communities with limited resources. This system can reduce content attrition while simultaneously supporting both long and short-term development, incremental and modular development, collaboration, and the distribution of materials in a variety of ways. The model is also intended for distance use and has a centralized structure that requires no more than a computer and an internet connection for collaborators and learners.

A variety of LMSs are completely open source and have no direct costs associated with the software, but because it was the option selected for the case study described by this dissertation in chapter 7, Moodle, a widely used (Moodle.org, 2013) and available platform will serve as the example. However, most major open-source LMSs share the majority of the following functionality. In Moodle, nearly all content is migration-friendly. Once put into the system, data can be exported at any time. It has media support for both playback and recording. Hypothetically, with the Learning Tools Interoperability (LTI) specifications and plug-ins, nearly any standard web-based format could be utilized. Even previous applications developed according to LTI standards should be able to be integrated into the larger system and shared with other users (IMS Global Learning Consortium, Inc., 2012). There are various options for communication (e.g., commenting, forums, chat) between collaborators, educators and students. File management options are flexible, as are backing up and duplicating processes. Also, there are robust course management options, including self-paced conditional paths, possible auto-graded assignments, varying levels of pre-programmed feedback (Heift, 2004), and other

features for general classroom support. The assessment capabilities include instructor monitoring of student usage and progress, and general gradebook integration for all graded activities. This way information is available related to student completion rates, what learning gains were made over the time they were enrolled in the course, and whether certain aspects of the course may discourage learner persistence. Also, statistics on individual questions are collected and analyzed by the system so they may be reviewed and improved. The interface and menu options can be encoded in the languages being studied, making the learning environment more immersive. Customizable user roles and permissions, in addition to course and resource nesting, provide secure areas for various parties to collaborate on culturally sensitive materials without opening the content up to community outsiders. Admittedly, Moodle is plagued by many issues LMSs in general face. Moodle has a learning curve and the default user interface can be a bit overwhelming at first. Again, the purpose of using an LMS for this argument is not to recommend a specific platform, but to provide a current and available option to act as an example for the arguments outlined above.

LMS-based courses can be constructed either in a hybrid, group distance learning (with or without an instructor), or a self-paced (Blin, 2004) /self-instruction (Umino, 2005) format. Many endangered languages have limited numbers of trained instructors and a dispersed demand. If there aren't enough students or resources to support a program at a remote school, students interested in learning a certain language could access programs online through an LMS. Instructor training courses could be created and deployed in a similar way. As discussed earlier (§4.2.2 & 4.2.2), computers may not be an ideal delivery method, depending on the language program's goals, but they are much better than no access at all (AbuSeileek, 2009).

#### 4.3.1. *Centralization*

It is now possible to have a single, centralized system for endangered languages that can handle content archiving, material development, collaboration, distribution and some basic documentation. To be clear, all of those functions do not necessarily have to be contained within the same platform (e.g., the same LMS), but instead utilize many if not all of the same technical resources (e.g., servers, IT admins). For example, the online archive (§5) and sample online course module (§7) developed for this project utilize two completely different software platforms (i.e., Moodle and WordPress), but both are hosted on UW servers and are maintained by the UW LLC. As will be discussed further later on in this dissertation, a key idea behind the centralized model is a reduction in the investment required for various remote educators and specialists (Yu, Sun & Chang, 2010). The hardware can be centralized by using a single physical server, a cloud-based option or using available space on a web server cluster managed by a university.<sup>60</sup> Plus, centralization allows remote access by any number of educators, specialists and learners via a major internet browser. IT support and training can either be handled on location or remotely by an individual, so each group utilizing the system does not need their own IT specialist.

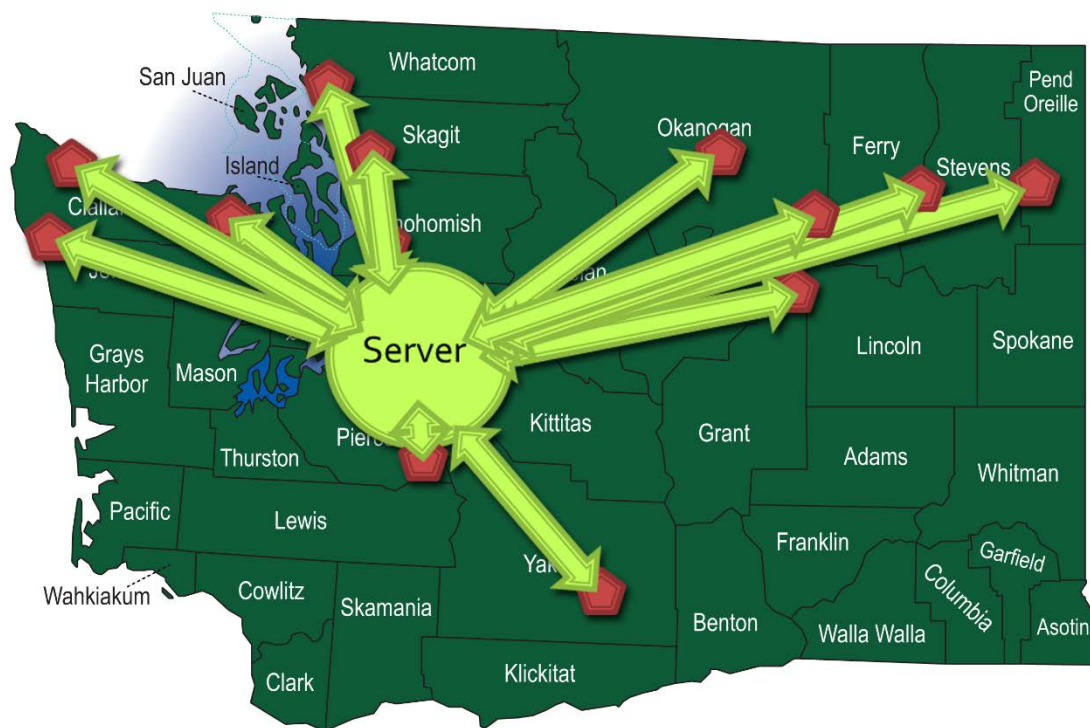
While LMS models may not fit all endangered language situations equally, as some locations do not have access to the internet, the language specialists that do have ready internet access could still use the system to collaborate and develop materials easily. From there, materials could be distributed on physical computer media (e.g., CD-ROMs) or paper-based media.

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<sup>60</sup> Even if communities were not comfortable using the UW servers and could not afford to host their own server, there are now some free educational LMS services like *freemoodle.org*.

Below is a map of Washington State provided to illustrate the idea of centralization that was discussed above. The circle labeled “server” represents the University of Washington, which currently hosts an LMS installation that can be remotely accessed from anywhere in the world through the internet. The university maintains the server and there are no associated costs for the end project user. Also, at this location there is staff to coordinate and manage the system. The smaller pentagons indicate example schools that teach an Indigenous language. Many are in remote and rural areas with limited resources, but all have internet access. Educators from any of these schools could hypothetically use the system to share resources and build online courses or activities for students.

Figure 15 Map of Washington State as a distribution model example



#### 4.3.2. Support coordinator

If a university, program or center has funding or volunteers, it is ideal to have a coordinator or editor (Nathan, 2012) to facilitate the training, collaboration, organization of the data and user access.<sup>61</sup> The coordinator does not need to be located at the server location. In fact, a community member may be more likely to stay with the project over time than an IT person at a university, who is subject to budget cuts and turnover. A community member would also have the advantage of increasing local control. As opposed to static HTML and file server based

<sup>61</sup> For the case study projects described in this dissertation, I served as the coordinator.

management, an LMS is a simpler option for providing various permissions and dividing responsibility among many people.

Therefore, even though the proposal is for a centralized system, local control can still be employed. Although the system is likely to be centralized in a non-local domain for some of the participants, the general direction of each individual project in the system should be guided by the goals, opinions and regulations of the associated community elders, leaders and educators. Endangered language community members and leaders are needed to oversee the security and distribution of sensitive materials, as well as to collaborate with students, educators and specialists. Although LMSs do seem to be a good fit in this case, they are not the only option available and future solutions may supplant them. This model is presented as a practical illustration of the discussion above, has been seen to show promise in its initial projects (§4.4.4), and addresses the questions provided in section 4.2 as well as adheres to most, if not all, recommendations put forth by Ward & Genabith (2003).

#### 4.3.3. *Using an LMS for the development of language learning materials*

Content and material creation is a complicated problem for a variety of reasons, including a lack of documentation for many languages, insufficient resources and lack of expertise. Here, the concept of *long-term* is emphasized.<sup>62</sup> New technology solutions allow for various collaborators to easily contribute pieces to a larger project which can then grow over time. It is possible to start small in the short term with simple assignments, lesson plans or other reusable e-learning objects (ELOs) (Muzio, Heins & Mundell, 2002) while working toward a long term goal (such as the development of a textbook, or complete online course). Courses can also be easily

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<sup>62</sup> Note that this usage of the term is different from the term related to archiving (§5) that is more synonymous with “permanent”.

duplicated and modified to fit various age groups and proficiencies as well as individual instructor's preferences. In other words, master courses can be developed, distributed and reused by a number of different instructors who can easily customize their courses while contributing new material back into ever-developing master courses.

An LMS or CMS (Content Management System) are also suitable to act as a centralized repository for materials and most media, whether the materials are intended for offline use or online deployment. In addition to basic resource sharing, there is also support for meta-tagging the resources, thus promoting better archiving practices. Content can be secured in various ways.

There are many in academia that can assist in the development process. Linguistics, which is a field that has gleaned much from endangered languages, can continue to give back according to the principle of linguistic gratuity (Wolfram, 1998). General and computational linguists can assist with documentation, provide raw content, and construct detailed grammatical analyses while providing information on acquisition and learning theories.<sup>63</sup> Applied linguists can provide pedagogical consultation and help with material development while conducting research on pedagogical efficacy. Other types of academics could contribute vital expertise, including those from fields such as anthropology and Indigenous studies, education, computer science, design (e.g., graphic, UI, etc.), library science, and history, to name just a few.

Unfortunately, many endangered languages have little linguistically rich and pedagogically sound learning content. This may be the result of severely limited documentation and, therefore, further stresses the importance of collaboration between specialists (§5.6.6). Even

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<sup>63</sup> One particularly valuable role computational linguistics can play in the development of pedagogical materials is in grammatical analysis and simplification for language which are morphologically complex, compared to English. In the context of Sahaptin, this issue is explored further in section 7.1.1.

in situations where there is an abundance of materials the accuracy and pedagogical effectiveness of the materials may vary considerably, as was the case with the archiving project that is described in chapter 5 and later addressed further in section 7.1.1. If educators don't have access to linguistically rich content and pedagogically sound materials and training, all available effort and expertise should be leveraged. The effort required to produce even simple solutions using limited meta-linguistic content is worth viewing through a long term perspective. While a single educator may not be able to develop a robust first-year online course for their respective language, an educator could contribute one or two pieces to the overall project. With further participation, coordination and some organizational effort, there may be substantial development within a few years.

#### 4.3.4. *Examples of similar projects*

Using a similar central collaborative and distributive model, an LMS-based (Moodle) online introductory course for the Xinkan language family was recently completed by the Center for American Indian Languages (CAIL) at the University of Utah. A primary goal for the project was to create 'awareness' of the language family native to Guatemala, which has very few fluent speakers (Dr. Chris Rogers, Director of the Center for American Indian Languages, personal email, 5<sup>th</sup> November, 2012). Also, as Guatemala has very limited internet access, it needed to have an offline component as well.

The project highlighted the importance of data mobility and redundancy as the CAIL was recently closed (Maffly, 2012). If for some reason the university decided to stop hosting the site, a duplicate of the LMS and course are available on a non-university based server maintained by

one of the developers of the course.<sup>64</sup> If an institution in Guatemala wished, it could host an installation of an LMS and the Xinkan course as well.

Learners who used the course responded favorably to the self-paced lesson format. Unfortunately, due to a lack of funding, finding community members to help expand the course has been difficult, but a Honduras official expressed interest in developing a similar course for Indigenous languages in their country (Rogers, personal communication).

The FirstVoices Language Tutor system was initially developed in Flash but was later migrated to Udutu—an LMS developed by a company residing in Victoria, B.C., the same city as the main project managers. The LMS functionality allows for activities such as listening, speaking, reading, multiple choice questions and flashcards, though at the time of review the publicly accessible course content is limited to flashcards and multiple choice fill-in-the-blank type questions. The tutor system also has an iOS compatible application for the LMS and a CD-ROM based version for people with no internet access (FirstVoices Project, 2010). There is a recently developed application, which functions on iOS mobile devices, that allows for chatting in endangered languages. There are also dictionary applications for at least eleven languages, for iOS systems only as well.

Language programs interested in developing a similar set of systems can learn much from the FirstVoices project. The project has been met with strong support and funding (B.C. FirstVoices Language Project, 2012), making the issues of complexity and maintenance less of a concern. For smaller communities, though, a project of this scope could be unsustainable. As the initial deployment of FirstVoices began in 2001, much of the technology used at that time is no

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<sup>64</sup> <http://www.languageconservation.org/courses/>

longer standard and there are plans for a substantial rebuilding of the existing system.

Considering the year the project was started it was well designed and used an Oracle database with Apple WebObjects framework, with some later additions using Macromedia/Adobe Flash (Peter Brand, FirstVoices Manager, personal email, 21<sup>st</sup> January, 2013) that could make content migration difficult in the near future. However, its database structure should allow the bulk of the content to be migrated to a future platform with far less effort than many other projects from that time.

Still, the current pedagogical potential of the three main FirstVoices sites is limited in comparison to many other standard LMSs. Hypothetically, all three sites could be integrated into a modern LMS that can be accessed via standard mobile devices, eliminating the need for iOS specific support. The impressive applications and games, if not already pre-existing, could be designed according to the LTI plug-in specification so that other communities could easily integrate them into their LMS or similar system.

Between the initial writing of the proposals in this chapter and the creation of the online Yakama sample course module (Ch. 7) I had the opportunity to work on two other projects modeled on these proposals. The first was a series of Lushootseed courses, which were developed in collaboration with the Tulalip Language Program. The efforts have been very successful and resulted in the creation of online hybrid materials for a full 101-203 sequence of courses, with the nearly every class day for the 101-103 series having accompanying daily activities available online. A standalone, culture-heavy course targeting community members with no prior language learning has recently been completed. The second case study was a

similar effort for Inuktitut through collaboration with linguists and speakers where the first draft of an intro course has recently been completed.

Building on the knowledge gleaned from these side projects, the two projects were undertaken for this dissertation to further assess the feasibility and potential effectiveness of the proposals outlined in this chapter. The first case study examines a large scale digital archiving project of learning materials for Yakama made available through the use of a CMS (Ch. 5). The second case study describes the development on a sample online course module based on the materials in the online archive. It assesses the challenges and possibilities of transforming non-interactive content into more pedagogically sound formats. It also examines methods for developing templates and training for educators to develop additional content for it (Ch. 7) and eventually integrate content into their own courses.

#### 4.4. CHAPTER SUMMARY

While this chapter has been concerned with technology and language *learning*, it is clear that the documentation of languages (in the form of grammars, lexicons, and texts) and the archiving of materials often intersect with discussion of a larger scaled solution. Documentation is arguably the most important issue facing endangered languages as they cannot be fully taught unless they are well understood (§4.2.2). Learning all we can from native speakers is a priority. While an LMS model similar to the one described above in section 4.4 has some utility for documentation and is suitable for archiving, there are much more powerful documentation tools available (e.g., Miromaa<sup>65</sup>, SIL's Fieldworks Language Explorer<sup>66</sup>), and other systems better

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<sup>65</sup> <http://www.miromaa.org.au/miromaa/miromaa-features.html>

<sup>66</sup> <http://fieldworks.sil.org/flex/>

suited for more extensive archives (Ch. 5). Systems such as the FirstVoices archive, which in many ways is superior to most LMS systems for basic documentation, also limit the documentation possibilities to primarily lexical items, songs and phrases with little to no annotation for syntactic, morphological, phonological, phonetic, prosodic, semantic or sociolinguistic information. Because of this lack of linguistic detail and the limited collaborative functionality with specialists, the crowdsourcing of data in the FirstVoices system for documentation can be a less effective use of language activists' time. If the goal is to revitalize the language to a degree that there will be new intermediate and advanced speakers then the *language* must first be documented.

When compared with LMSs and other educational systems, documentation tools (e.g., FieldWorks, Miromaa, TshwaneLex<sup>67</sup>, etc.) in general do not currently have the pedagogical organization and presentation flexibility to optimally facilitate learning. Documentation tools do, however, support many export functions that provide data in a format for easier integration with most LMSs. Future computational linguistic research may develop more robust methods or applications for converting well-annotated data into something pedagogically sound that can then be more-smoothly integrated into an LMS or similar system.

Although this proposed model is complicated and requires effort to build and maintain momentum for participation, it is feasible. As discussed above, a project of a similar nature using a centralized LMS-based model was carried out at the Center of Indian Studies at the University of Utah for the language family Xinkan. So far, an introductory set of educational materials (as online courseware) has been developed and the response has been favorable. Also, FirstVoices,

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<sup>67</sup> <http://tshwanedje.com/tshwanelex/>

with its application development, wide community participation and support, serves as an inspiration to communities around the world looking to collaborate. Other less-commonly taught languages at the University of Washington (e.g., Korean, Japanese), which previously had multiple instructors developing their own resources in isolation, have moved to a centralized, archivable, collaborative system based on an LMS that is similar to the one described above with great success. Again, currently no LMS is a perfect piece of software, and open source software has its associated benefits and complications. The key is not the current software but the long term potential of development and transference to future platforms.

Before moving on to the next chapter of this dissertation it is necessary to reiterate that the arguments presented in section 4.2 of this chapter also highlight some potential misuse of technology. Solutions sometimes require substantial resource investment. This investment can be financial in nature or simply an investment of time and energy. Regardless, it is crucial that the developed resources and all core content belong to and be accessible by the associated communities (§2.3.1, §5.5 & §6.7.3.5).<sup>68</sup>

The most valuable resource endangered languages have are the native speakers. For those languages which are highly endangered and moribund, the time of native speakers who are working on their language should be respected and maximized to further the vitality of the language. If their time and energy is focused towards crowdsourced documentation or material development without the necessary technical knowledge or support, it may be wasted effort.

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<sup>68</sup> As an example, Rosetta Stone's Endangered Language Program grants the following rights to the program sponsors, who may be an organization associated with the community. "Sponsors retain ownership of the language materials developed during the project, and they gain exclusive sales and distribution rights over their finished edition." (Rosettastone.com, 2013)

At this point, complicated software development is arguably another less than ideal use of resources. Many developers with sufficient resources and expertise have already created and are supporting applications that can aid the documentation, development and distribution of learning materials, so for endangered language efforts that is where the main effort should be directed: *toward documenting, developing (Ch. 5) and distributing content (Ch. 7).*

## PART TWO: YAKAMA (YAKIMA) SAHAPTIN

### 5. THE BEAVERT-JAMES HERITAGE COURSE ARCHIVE OF YAKAMA (YAKIMA) SAHAPTIN

This chapter describes the development of a digital archive of Yakama (Yakima) Sahaptin language learning materials created by Dr. Virginia Beavert and Edward James.<sup>69</sup> This archive is the primary case study undertaken for the dissertation and draws heavily on the proposals made in chapter 4, especially as the content was later used to develop the sample online course module discussed in chapter 7.

As the materials are for the Yakama (a.k.a. Yakima) dialect of Sahaptin, section 5.1 begins with a review of the language, focusing on its current estimated vitality and the linguistic elements closely related to the pedagogical topics emphasized by the needs analysis data (§6.7.9). Section 5.2 provides a geographical and demographical context for the Yakama language and the place where the materials were created and used. The background of the archive is given in section 5.3, which includes a history of the materials and a description of the initial curation and digitization processes. Relating to the topic of sensitive cultural content, section 5.4 examines security and ethical considerations for the archive and others like it. In section 5.5, the creation of the online platform for the archive is discussed as well as the preparation for transferring content to a permanent archive. Section 5.6 concludes with a brief summary of the key findings of this specific case study.

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<sup>69</sup> An earlier version of this chapter appeared as Hugo 2015b.

### 5.1. SAHAPTIN AND THE YAKAMA (YAKIMA) DIALECT

Yakama/Yakima/Ichishkíin Sínwit<sup>70</sup> is a dialect of the Northwest cluster of the Sahaptin language (Rigsby, 1965; Rigsby and Rude 1996; Rude, 2009). Ethnologue classifies the vitality of the language as being 8b, meaning it is nearly extinct (Lewis, 2009). In 1997 it was estimated to have had 3000 speakers (Lewis, 2009), but more recent estimates for the population of speakers are between 15<sup>71</sup> and 125 (Golla, Campbell, Goddard, Mithun & Mixco, 2008).

Sahaptin and Nez Perce are the two languages of the Sahaptian language family (e.g. Aoki, 1963), which is considered part of the Plateau Penutian phylum (Delancey & Golla, 1997; Silverstein, 1979). It was traditionally spoken in what is now the southern half of eastern Washington state and the northern half of eastern Oregon. Dialects of Sahaptin are argued to be mutually intelligible (Jansen, 2010; Rigsby, 1965).

Sahaptin is a language with robust morphology, varying syntactic alignment (nominative, accusative, & ergative, among other case-marking), inverse vs. direct marking, and flexible word order. Primary grammatical resources are Jacobs (1931), Rude (1989, 1992, 1994 & 1997), Rigsby and Rude (1996), Beavert & Hargus (2009) and Jansen (2010).

### 5.2. GEOGRAPHY AND DEMOGRAPHICS OF THE YAKAMA REGION

The Yakama Nation's current reservation boundaries largely fall within Yakima County, but a small portion of land also sits in Klickitat and Lewis County. The 2014 census data estimates a total of 247,687 residents for Yakima county, with only 6% identifying as "American Indian and Alaska Native alone" (United States Census Bureau, 2015). The majority of the

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<sup>70</sup> Again, see Rigsby (2009a,b) for an etymological review of these names.

<sup>71</sup> Joana Jansen (personal communication to Sharon Hargus, 2008)

county's population identifies as "Hispanic or Latino" (47.7%) and 45% identifies as "White alone, not Hispanic or Latino". The main city of residence for Yakama Nation citizens is Toppenish, where they make up 8.0% of the population. The demographics of Toppenish differ considerably from the county at large as the majority population in the city identifies as "Hispanic and Latino" (82.6%) and the next largest group is "White alone, not Hispanic or Latino" (8.8%). Heritage University, where the Yakama language has been taught for at least two decades, is located in Toppenish. While Toppenish is known primarily as a farming community, there are other sources of employment (including the Yakama Legends Casino). However, its median household income (\$29,692) is considerably lower than that of the neighboring city of Yakima (\$39,462). A key economic and cultural influence is the 327,000 acre U.S. military training center (Joint Base Lewis-McChord Yakima Training Center, 2015). The southern border of the training grounds is approximately 20 miles to the north of Toppenish. Clearly, the demographic status (§2.2 & Giles et al., 1977) of the language is very low as the group that is affiliated with the language (i.e., the Yakama Nation) is very much a minority in the area. Accounting for the very small number of fluent speakers (§5.2), the demographic status is even more bleak.

As it is one of the key avenues for the community to access language education locally, it is important to understand the needs and status of the Yakama/Sahaptin language classes at Heritage University. Associate Dean of Heritage, Mary James provided some background on the course series and its recent history to help inform the needs analysis described later in this dissertation (§6.2.8). The Sahaptin language course was first offered for the fall semester of 1990. From the founding of Heritage (College) University, until fall 2008, a world language was an individually required general undergraduate credit (GUCR) course. Students often took a second

semester as a requirement within the lower division core of their majors. During this period, the average enrollment was usually 10-15 students for the 101-102 Sahaptin language series and 5 students continuing on to the 200 level courses. From 2008 to 2015, the world language course enrollment was assigned to the Humanities GUCR category and was one of 15 different types of courses that students could choose (they needed to choose only two) in order to satisfy the humanities/social science electives. In addition, during this time most majors removed their lower division core. This seemed to have an effect on enrollment. On October 13th, 2015, the final step of approving a revision of the GUCRs restored 'world language' (§2.3.1) as an individually required GUCR course, to be effective beginning in Fall Semester 2016. Currently there are only two non-English languages taught at Heritage, Sahaptin and Spanish. American Sign Language will be offered starting spring 2016, but it is not expected to impact Sahaptin enrollment. Dean James estimates that with the requirement reinstated, 20-25 of an estimated 150 first year students may enroll in Sahaptin 101. This adds further support for the idea that the needs of the Heritage course program must be considered in the final deliverable products stemming from this dissertation.

### 5.3. BACKGROUND OF THE ARCHIVE

#### 5.3.1. *Origin of the materials*

Between approximately 1990-2003, Dr. Virginia Beavert, a Yakama elder and native speaker of Sahaptin, and one of her students, the late Edward James, taught Sahaptin language classes at what is now Heritage University in Toppenish, WA. For those classes Virginia, with the help of Prof. Mary James and Edward James, who eventually became an instructor of Sahaptin, developed numerous pedagogical materials. The majority of the content was developed

by Virginia, but Mary assisted by entering the materials into a computer for roughly the first five years. Soon after, Virginia purchased a computer and began creating some of the materials herself. Edward and Mary continued to help with the creation of the materials in varying degrees over time, including assisting Virginia with using word processors and other software for creating content. Over time, Edward began to co-teach the course with Virginia and eventually taught the course on his own for a while. During this solo teaching period, Edward created some materials.<sup>72</sup> For a period of between 2-4 years, when Virginia was teaching the class, Mary attended and she took handwritten notes for each of Virginia's lectures. These notes are also part of the archive. A student attending Heritage at the time also helped to create some of the exercises that required special software (e.g., crossword puzzles).<sup>73</sup> All of the materials in the archive were collected and stored by Edward and Mary James.

Edward died in 2011, and in 2013, Mary, his widow, gave the materials to University of Washington Professor Sharon Hargus for preservation and archiving. The materials consisted of roughly 21 banker boxes containing paper materials (Figure 17), over 300 audio cassette tapes and a handful of video cassettes. Sharon invited me to work with the materials and make them the core of my dissertation. Under her supervision, I began preparing the materials for archiving. After the paper materials had all been digitized, the UW archives at that time did not have the means to construct a community accessible archive. It was then necessary to develop a temporary archive that could provide access in the short term but allow a smooth transfer to a permanent archive. An online archive system was deployed which was constructed around the common and well-supported Content Management System (CMS) WordPress. The archive

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<sup>72</sup> These can usually be identified in the archive because they were typed in ALL CAPS.

<sup>73</sup> Mary James, personal communication, 02/2015.

became a large part of the overall dissertation project, acting as the primary data for the online course module. In this chapter, I will outline some of the processes used and challenges faced when constructing a short-term and accessible archive that is feasible for a less-resourced community to build and manage. The specific archive this chapter is concerned with is intended to be housed in a permanent archive in the near future and must be readily transferable when one is found.

Figure 16 *Materials as delivered to the UW*  
(Upper left: Prof. Sharon Hargus discussing the newly arrived materials.)



### 5.3.2. *Challenges*

From the outset, there were two challenges facing this project:

- 1) *How can the materials and the information they contain be preserved for as long as possible?*
- 2) *How can the materials be made as accessible as possible (respecting necessary restrictions)?*

The question of preservation is, in and of itself, a common focus of discussion, and Borghoff, Rodig, Scheffczyk, & Schmitz (2005), in particular, provide a good review of the issues there in. Many physical media formats have traditionally had a very limited lifespan, and using computer-based physical media (such as floppy disks and CD-ROMs) to archive material has become problematic in a remarkably short time. In 1995, it was considered perfectly reasonable to archive documents in the Word Perfect (proprietary software) format on 4.25” floppy disks, but in less than 20 years, the changes in computing have made accessing media in that format difficult (assuming the data is still in a viable format and the physical media, itself, has not been corrupted). Newer forms of digital storage seem to be more promising (e.g., cloud-based) but present new challenges as well.

A distinction needs to be made between the temporary archive, which will be the focus of this chapter, and an eventual permanent archive. The Consultative Committee for Space Data Systems (CCSDS) Open Archival Information System (OAIS) (CCSDS, 2012) uses ‘long term’ to describe any archive that is intended to be kept, hypothetically, forever. The archive system that was constructed for these materials does not meet the standards outlined by CCSDS and the infrastructure to support it for the long term was not currently available. Therefore, the constructed archive is a ‘temporary’ archive intended to improve the accessibility of the materials in the short term. Eventually, the materials will be transferred to a ‘permanent’ home, which is an archive that is equipped for ‘long term’ storage. ‘Short term’ can be defined as a period as long as a community can support it. As will be discussed later on, the infrastructure and resources required for ‘long term’ archiving are substantial and beyond the means of most, if not all communities. It is impossible to clarify or predict the length of the term for a ‘short term’ archive. Instead, the utility of the term is to emphasize the caution and maintenance that will be

necessary should a community forgo having content held in a ‘long term’ archive. This issue will be explored further throughout this chapter.

As such, the permanent archive where the Sahaptin materials will eventually be stored should be equipped to deal with technological changes, making it imperative for the temporary archive to store materials in a way that reduces the risk of loss or corruption of data as much as possible. “Preservation is not a discrete process, but rather a never-ending management task” (Edmondson, UNESCO & Information Society Division, 2004: 20). The paper materials, which I focus on in this chapter, have an arguably longer lifespan than most digital media when said paper materials are stored in a controlled environment, but they, too, are at risk for loss or damage (e.g., fire, water, mold, etc.). The issue of long term preservation and accessibility, therefore, becomes of paramount concern and will be discussed further in (§5.6).

### 5.3.3. *Sorting*

The first step in archiving the Sahaptin material involved assessing the materials present. I worked with Prof. Hargus to ensure a large portion of the boxes were opened and that an initial audit of types and quantities was done. Much of this work required Prof. Hargus’ language expertise, and from this audit, we developed an initial set of categories into which we sorted the materials. A makeshift sorting station was created in Prof. Hargus’ office with receptacles representing each of the initial categories (e.g., culture, grammar, lexicon) and a larger bin was added for materials that didn’t fit into one of the existing categories. Phase 1 of the sorting began with the removal of unnecessary coverings (e.g., plastic sheets and binders) and included a careful recycling of clear duplicates. Many of the documents contained only minor differences, which made this step of the process an arduous task. An assignment given five years in a row, for

example, might contain slight amendments each year or a different set of hand written annotations, so when any of the content differed, all versions were kept for archiving. In instances where content was wholly identical, only the copy with the highest quality and most legible text was retained.<sup>74</sup> For audio and video materials, all copies were kept so in case there were issues or artefacts in various copies and an ideal copy could be constructed using them.<sup>75</sup>

During this initial phase, Prof. Hargus reviewed the uncategorized materials and suggested new categories to be added as needed. Some of the materials didn't belong in the learning material archive at all (e.g., random notes about the language with no pedagogical application, news stories about the Yakama region), so these were set aside to be reviewed by Prof. Hargus at a later time.

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<sup>74</sup> Exact duplicate copies were not seen as valuable for this project as their existence in the original material set were not duplicated for archival purposes, but only due to limited organization. Since this was not intentional, information about how many copies of a certain version of a certain materials provided no value and would add unnecessary clutter to the archive listing.

<sup>75</sup> For example, in the archive there are over ten different copies of the same original audio recording of Virginia Beavert teaching the alphabet, but each have differing qualities.

*Figure 17 Photos of the Phase 1 Sorting Process  
(L=Duplication check and recycling, R=Phase 1 completed)*



After all of the boxes had been reviewed once, the second phase of sorting began. Because many of the materials fell into multiple categories (e.g., grammar AND culture) each category of materials was reviewed for duplicates, and some materials were re-categorized or given a second category when applicable.

*Figure 18 Photo of the Phase 2 Sorting Process*



Each of the larger categories were then sorted a third time. This phase of sorting had three goals: 1) to eliminate further redundancies (i.e., duplicates); 2) to sort the material into relevant sub-categories; and 3) to organize relevant content by date or proper sequence, as some of the associated materials were spread across multiple boxes.

Figure 20, below, shows the sorting spread of a single category, so it is little wonder the sorting process took approximately four months of part-time work. We knew the better organized the materials were prior to scanning, the less room for error there would be when the scanning, bundling and archiving of the digitized versions occurred.

*Figure 19 Photos of the Phase 3 Sorting Process*



#### 5.3.4. *Textual materials*

##### 5.3.4.1. *Selecting a format*

Johnson (2004) discusses the three primary formats used in an archive—*archival*, *working* and *presentation*—and provides the following example: if you have a grammar, the *archival* format might be Extensible Markup Language (XML), the *working* format Microsoft Word, and the *presentation* format PDF/HTML. Since the source of all text materials in the Sahaptin Archive were physical papers, though, this distinction did not apply as strictly.

Another recent digitization and archiving effort is the Dena'ina Language Archive, which utilizes metadata standards and is backed up in the Arctic Region Supercomputing Center and available via an online interface (Holton, Berez, & Williams, 2007). While approximately a third of the size of the Sahaptin Learning Materials archive in volume (Alaska Native Language

Archive, 2011), the contents of the Dena'ina Language Archive are considerably more diverse and complicated. The archive also utilizes a high quality, uncompressed file format (TIFF). Unfortunately, TIFF and similar formats, were not feasible for the Sahaptin Archive due to size considerations and lack of proper equipment. Because of the excessive page counts for some resources and the duplications with varying annotations, relying on a file format like TIFF that is best suited to a single page it would be too cumbersome for the resources available.

In conjunction, the materials were to be archived in the same form in which they were given to the UW, meaning many of the documents contained errors or had aesthetic issues. Simply reconstructing each document in an editable Unicode or vector format was not feasible. This created *archival* and *presentation* formats with identical but potentially inaccurate content. Thus, only the *working* format could be corrected and supplemented with notes on each material's dedicated page in the short term archive system.

According to Johnson, the “*general requirements for archival-quality (master copy) formats are that they be:*

- *non-proprietary; that is, their encoding is in the public domain;*
- *thereby amenable to forward migration to new formats over time;*
- *portable, re-useable, repurposeable;*
- *the best possible reproduction of the original (if not original themselves)”*

(Johnson, 2004: 7)

Borghoff et al. (2005) follow a criteria similar to that of Johnson, above, recommending standard formats for archived images (e.g., PDF, PostScript, TIFF, GIF and JPEG). While the

TIFF format offers much better data preservation than PDFs, the extreme storage costs, the inability to easily bundle them without complicated processing (i.e., for multiple pages) and the display limitations (e.g., cannot be easily rendered in a browser) make TIFFs less practical for the purposes of this particular archive. Similarly, the GIF and JPEG formats, while browser friendly, lack Optical Character Recognition (OCR) compatibility as well as the bundling and print functionality of PDFs. PostScript offers no real advantages to PDF, either, other than in its compression differences. As such, the PDF standard is one of the most commonly used formats for documents today, and although technology is unpredictable, it is likely to have substantial longevity and, more importantly, portability in the future. A major downside to this digitization process is that the end result is an image and not a digital document. While PDF has some OCR capabilities for English, it is still problematic, and even more so when used with other languages. It was essentially useless with the Sahaptin character set. As a result, PDFs may require the omission of digital layout and design elements (e.g., text formatting), but an accompanying archival format in XML and/or RTF greatly improves the portability and usability of the data (Cushion, 2004). Doing such with the Sahaptin Archive, though, would have been far beyond the current state of OCR and would have been unfeasible with the limited resources available for the project. A compromise, therefore, needed to be struck. The present utility of the limited English OCR, while beneficial if an effort were to be made to fully digitize the text in the future, is primarily limited to being indexable by a search engine for improved accessibility and did speed up the migration of the content to a text-editable *working* format by copying and pasting. Because of the scans' limited OCR support, they must be considered primarily images and not digital documents, or as Borghoff et al. (2005) term it, *hybrid* PDF documents.

An ideal format for the archive is one that is non-proprietary, primarily because of cost issues and open-source flexibility for future migration. Adobe still has ownership of some of the functionality of the PDF format, but the functionality that was required by the materials in the Sahaptin Archive falls under the open source International Organization for Standardization (ISO) PDF format. The format that was selected needed to meet the non-proprietary requirements. PDF did not have the same type of oversight and level of standardization as the American National Standards Institute (ANSI) or the World Wide Web Consortium (W3C), but “PDF...has become a de facto standard for the exchange of printable documents” (Borghoff et al., 2005: 36).

#### 5.3.4.2. *Scanning*

The PDFs of the Sahaptin materials were scanned on a XEROX ColorQube 9201.<sup>76</sup> set to *high quality* and 300 dots per inch (DPI) resolution. The minimum amount of compression the copier allowed was used. This resolution was considered sufficient for the archive as the majority of the source documents were third (or more) generation photocopies. Testing found no OCR advantages for increasing the resolution beyond 300dpi and little visual improvement considering the accompanying file size increase. Additionally, print comparisons of the scanned PDFs and the original documents showed no substantial differences in quality. Increasing the resolution, even to 450dpi, added a substantial load on the network when the printer processed and transferred the files, and it would also have increased the final size of the archive considerably. Therefore, the 300dpi standard was chosen to maximize the portability and longevity of the archive as well as to maintain a reasonable estimated time of completion.<sup>77</sup> For

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<sup>76</sup> The author would like to thank the University of Washington Language Learning Center for the use of their document scanner for this project.

<sup>77</sup> Thank you to Anna Moroz, a departmental RA in the Linguistics Department, who agreed to audit some of the paper materials after the scanning had been completed to check for scanning errors and missing content.

archives where text documents are digitized to a higher quality standard, an 8.5” x 11” greyscale 300dpi TIFF file totals about 8mb, while a color version would be about 24mb. PDF compression by the XEROX ColorQube 9201 reduces the greyscale file size to less than 100k per page.<sup>78</sup>

#### 5.3.4.3. *Deskewing*

A balance was sought between the quality of the scans and the efficiency of the process. Some bulk scans, for instance, resulted in a moderate skewing of the document, and other documents in their original form which were askew were left uncorrected. Adobe Acrobat does provide some deskewing functionality, but deskewing, in this case, would have resulted in the document being compressed again and losing further information.<sup>79</sup> According to available documentation, the only way to bypass the compression would have been to extract each page into an uncompressed format (e.g., TIFF), import it into a photo editing suite (e.g., Adobe Photoshop) manually deskew it, save the file again, and then reconstruct the PDF. Doing so would have greatly increased the workload and the file size of the PDF if further compression was not then completed. For this reason, we decided that unless there was a loss of information, minor skews were tolerated in the archived scans. Again, these skews were primarily a reflection of the original prints, although a few were the result of large multiple page imports and bindings.

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<sup>78</sup> These numbers reflect scans performed with the lowest setting of compression in the scanner’s settings. It should be emphasized that this level of compression is not recommended for any archive. This was a matter of practicality and limitation of the tools at hand. The only benefit to having highly compressed PDFs is for the download time and improved embedding in a webpage. The documents scanned for this archive were primarily computer print outs or multiple generation copies so additional compression was not as much of a concern as it should be for archives with other types of source material, such as photographs and illustrations.

<sup>79</sup> The information that would be lost here is digital, due to a transfer from a lossy file format to another lossy format. Hypothetically, no actual language information would be lost (e.g., the letters on the page), but the quality of the letters would be reduced.

#### 5.3.4.4. *Migration*

Borghoff et al. (2005) refer to the transfer of media type, for example from paper to digital scan as *migration or from an existing digital format to a future format*, stating that “to date, migration is probably the most common method used to preserve digital data” (IX). The authors cite the Task Force on Archiving of Digital Information’s definition of migration.

*“Migration is the periodic transfer of digital materials from one hardware/software configuration to another or from one generation of computer technology to a subsequent generation. The purpose of migration is to preserve the integrity of digital objects and to retain the ability for clients to retrieve, display, and otherwise use them in the face of constantly changing technology.” (TFADI, Commission on Preservation and Access, & Research Libraries Group, 1996)*

The ability to transfer the Sahaptin documents is, therefore, of paramount concern to the permanent archive, but was also crucial for the temporary archive seeing as the formats chosen for the temporary archive needed to provide as much flexibility as possible. The permanent archive might, in time, use a different format for storing data, so the content housed in the temporary archive needed to be easily transferrable as a migration will most likely occur at some later point.

Even so, further migration is still an issue facing PDFs. Though future formats cannot be predicted, there is always a risk taken when migrating from a compressed, or lossy format, to any other format. If additional compression is added to the file during migration, there will be data loss, and if no additional compression is added, but the same compression functionality does not exist in the new format, there will be a growth in the storage space required for each material.

Both of these situations constitute a *transformation* (Borghoff et al., 2005: 47). If, however, there is no loss of information and no excessive increase in storage space needed, a successful migration is termed a *refresh* (Borghoff et al., 2005: 38).

These issues above are examples of why an archive that is intended to remain in a community without an institution that can handle ‘long term’ archiving must expect substantial effort to be required down the road. In addition, while there may not be any intention to transfer the documents to a community-external ‘long term’ archive at the time of the ‘short term’ archives creation, it is vital that the means to migrate it exist as needs and opinions may change in the future, and the community may establish a ‘long term’ archiving institution that could host the content at a later time.

#### 5.3.5. *Audio materials*

While the majority of the focus in this chapter regarding the archive deals with the digitization of the paper materials, support for the audio files is required as well. The processes and standards for digitizing have been covered elsewhere thoroughly (e.g., Plichta & Kornbluh, 2002) so this section is instead concerned with the process of archiving and the accessibility of uncompressed digital audio files (commonly in either a .WAV or .AIFF format). All of the audio cassettes were digitized or audited, and the total of the cassettes that were related to Sahaptin was 395.<sup>80</sup>

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<sup>80</sup> The remaining tapes were either blank, had popular music on them, or were completely unrelated to the other archive materials. Two-thirds of the audio materials were digitized by the author using a Nakamichi MR-2 routed into an M-Audio Mobile Pre USB interface and recorded into Sony Vegas. The remaining audio materials were digitized by Prof. Sharon Hargus and UW Linguistics Department graduate research assistants under her supervision using a similar equipment setup. As opposed to the sorting process for the textual materials (§5.4.3), no duplicates of audio materials were discarded. All cassettes containing language or culture-related content, including multiple copies of the same resource, were digitized and archived.

### 5.3.5.1. *Lossless*

Working with audio comes with a different set of concerns than digital documents or images. First, in the case of this particular set of materials, the issue of size becomes especially relevant. The compression rate for the print materials when converted to PDF is fairly good compared to lossless audio files. An uncompressed mono 24-bit audio WAV file with a sample rate of 44100hz would be around 465mb per hour of recording time, which, with lossless compression can be reduced to a value around 225mb depending on the content. Recent developments in compression techniques for audio files have resulted in a few options that can substantially reduce the size of a raw audio file (i.e., by some estimations, an average of 40-50%) without any loss of information (i.e., lossless), as opposed to more widely used lossy compression formats (e.g., MP3, AAC). Of these options, it was found that the Free Lossless Audio Codec (FLAC) (Xiph.Org Foundation, 2014b) would be the best fit for the project. While FLAC is not widely supported by Apple OS products, it can be played and edited by many commonly supported open source software options (e.g., Audacity). Apple recently open-sourced their lossless codec and encoder, the Apple Lossless Audio Codec (ALAC) (Apple, 2011), and the compression rates and feature sets between the two formats are very similar. However, for this project, FLAC is preferred as the costs of non-OSX hardware and software are comparably lower and the format is arguably more widely supported.<sup>81</sup> Additionally, ALAC has no built-in error checking functionality, while FLAC does.

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<sup>81</sup> As an example, FLAC is the default audio format for the Internet Archive (Internet Archive, 2014). However, as of 2014, FLAC cannot be uploaded directly into the dashboard of the Content Management System selected for this project (Wordpress) without an additional plugin. Manual FTP uploading is required.

### 5.3.5.2. *Audio metadata*

One advantage many compressed digital audio formats (e.g., FLAC, MP3) have over uncompressed formats (e.g., .WAV, .AIFF) and print (with PDFs) formats is that the encapsulated metadata functionality is much more robust, as they support ID3 (O’Neill, 2013) tagging. With ID3 tags, information on each file, corresponding to the resource’ metadata (§5.4.5.2) in the archive, can be added. ID3 tags are widely supported for viewing in audio players and many open-source audio library management platforms (e.g., iTunes, Foobar 2000) provide options for quick editing at the bulk and individual level. The issue of file accessibility within the temporary archive system will be discussed later on in this chapter (§5.6.5).

### 5.3.6. *Video materials*

There were only a few video materials associated with the collection of materials destined for the Sahaptin Language Learning Materials Archive. The issue of archiving video faces many communities and will continue to become more common as time goes on. In this section, I will review some of the special concerns related to video, specifically metadata limitations and problems limiting distribution.

#### 5.3.6.1. *Video metadata*

Extensible Metadata Platform (XMP) (Adobe, 2014b) was originally developed by Adobe for use in Acrobat, but has become one of the more popular standards for video metadata. For the purposes of this and similar archives, the standard is ideal as its codes are based on the Dublin Core Metadata Initiative (W3C, 2008) and XMP was recently adopted as an ISO standard (Gasiorowski-Denis, 2012). Common video formats that support XMP metadata include QuickTime (MOV), Video for Windows (AVI), Windows Media Video (WMV), and MPEG-4

Part 14 (MP4) (Adobe, 2014a). OGG for video does not support XMP, and currently has only limited metadata support using *VorbisComments*. While the more open source nature of the format might be appealing for audio, the metadata and functionality limitations of OGG video make it less than ideal for archiving purposes.

#### 5.3.6.2. *Size and distribution of video resources*

It is argued in this chapter that there is a benefit for having a compressed (ideally, lossless) and uncompressed (especially for situations where lossless compression is unsuitable) format for a certain file format for instances where accessibility is as much of a concern as preservation. The difference in size between a compressed and uncompressed file for audio and images is substantial, but does not compare with video. In fact, providing uncompressed video of any substantial length over a web server is likely prohibitive for most similar archives. For example, thirty minutes of video that has limited lossless compression, 8-bit, 1280x720 with a framerate of 29.97 could be around 138 GB. The same specifications but with the MPEG-4 Part 10, Advanced Video Coding format (aka H.264) default settings would be 13 GB.<sup>82</sup> Even the compressed file would be expensive to deliver via a webserver. Assuming that the majority of materials for endangered language learning material archives are on lower resolution formats, a thirty minute NTSC uncompressed 640 x 480 file would be around 30 GB. Therefore, in order to provide any reasonable accessibility to the video file, a compressed, and inevitably lossy, file format must be used. Of the formats listed above (§5.4.6.1) that support XMP metadata, AVI and MP4 are arguably the most widely supported by both applications for production and those for consumption. AVI makes a suitable lossless format, and MP4, the compressed deployment copy.

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<sup>82</sup> All of these numbers are estimates and can vary widely depending on settings and the compressibility of the video (i.e., static shots with minimal changes vs. lots of detail and movement).

Without substantial available resources, setting up a streaming media server is not feasible. The financial costs alone are likely to be out of the question for most communities. Therefore a compromise must be struck and an external streaming service will likely have to be used. Some communities may have access to a university that would be willing to host the files which could provide some additional control or security. Most communities, however, may have to use an online service such as YouTube or Vimeo to host their files. The downside to this is that, even with password protected and unlisted files, some control of the files is lost. Regardless, this may be a necessary compromise.

MP4, using the H.264 codec, is a standard supported by most, if not all, major online video streaming services. Google Drive offers similar streaming functionality for video files using the YouTube system but keeps the files outside of the YouTube system proper, although at the time when this dissertation was written, there were significant issues with the Google Drive video streaming system that made it impossible to recommend.<sup>83</sup> Once files are hosted, and set as unindexed for searching, in a streaming service they can be embedded within the archive CMS on the proper resource page with the metadata. At a bare minimum, the video's page on the service (e.g., YouTube page) should contain a link to the URI/URL for the resource in the archive.

#### 5.3.6.3. *Backups of uncompressed video*

Finally, there is the issue of storing the uncompressed files. It is possible that some communities could have terabytes worth of files. If resources are available, a service offering

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<sup>83</sup> For a test, some video files were deployed using Google Drive and embedded them elsewhere. All video files were played the same amount of times, but seemingly at random, certain video files were blocked by the system for further streaming. This issue could only be resolved by deleting, re-uploading, and re-embedding the files.

low cost, infrequent access, online storage could be used (e.g., Amazon Glacier). A less ideal, but more cost effective solution for community archives that don't have the resources for long-term archiving is the following. First, multiple PC workstations at multiple locations will be needed, as it's vital to have offsite backups in any situation. Each of these workstations should be equipped with hard disks<sup>84</sup> dedicated for the archive. Each workstation would then install *BitTorrent Sync*, or a similar service, that will securely keep the data consistent on all of the workstations. The service transfers files in secure packets from one computer to any other peers (i.e., the other workstations) until all of the data on the transferring drive or folder matches the peers. With such a service, there is no reliance on the cloud, and so data security is improved and cost is limited to the purchase and upkeep of any physical hard drives and workstations.

#### 5.4. OVERSIGHT, OWNERSHIP AND CURATION

As opposed to many cases of the digital archiving of Indigenous materials (e.g., Christen, 2011<sup>85</sup>), the digitized versions of the Sahaptin learning materials are intended to replace the originals in most cases. The original documents were collected by Edward James for the sake of archiving and had previously been inaccessible to educators and learners, so this, new digital

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<sup>84</sup> An anonymous reviewer recommended enterprise class hard disks with a predicted high Mean Time Between Failures (MTBF) number. Organizations can also increase the life of the hard drives by limiting negative environmental factors, such as excessive heat or vibration. However, no assumptions about the life of the hard drives should affect the implementation of a redundant, live, offsite backup as described above. As long as there are multiple computers which are properly set up to handle the backups, multiple consumer grade hard drives are much better than one or two enterprise grade drives.

<sup>85</sup> Christen covers a variety of issues facing Indigenous/Aboriginal archiving, but particularly interesting is the need for community perspectives and voices in the presentation and cultural protocols related to the materials. While, there is a need for community perspectives on cultural protocols for this archive with respect to security and protecting materials, additional presentational notes beyond metadata, annotation and pure description is something that is beyond the scope of this archive and can be handled by external organizations or systems.

archive brings an enormous increase in accessibility. Documents that once occupied 20+ banker boxes are now filtered for redundancy and searchable using a variety of means.

#### 5.4.1. *Copyright*

The issue of copyright is connected to a few dilemmas facing the archive, particularly access with respect to ownership and National/Tribal/Community preferences.

*“The heart of the problem lays in the intent of copyright. Copyright is meant to protect individuals, creators, while ensuring the public has a level of access rights. This is a (sic) idea meant to promote propagation while individuals are compensated for the dispersal. In this situation, the net effect is that a communally owned creation is considered public domain, or free for all. Communal creations have no individual to protect; what is more, since there is no individual, everyone owns it”* (Wolf (Jr.), M. R., 2008: 138).

Francis & Liew (2009) echo this concern that copyright is oriented towards the individual and does not account for Indigenous concerns, but notes that efforts are underway to change this. Another issue they raise is that definitions of legality may differ between nations, with the dominant (i.e., usually non-Indigenous) population’s definition and needs overruling those of the minority nations. Christen (2008) also, deals with the complexities of balancing security and accessibility.

The majority of the content in the Sahaptin Archive was created by Dr. Virginia Beavert, with support from Edward James and (now Dean) Mary James, who donated the materials to be archived and made available in the first place. However, some items contain content that may not have been created by Beavert or James and, instead, belong to, as an example, the cultural heritage of the Yakama nation. Although most of these materials were used in a classroom and,

as such, are likely not as potentially culturally volatile as pure documentation or text collections (e.g., Innes, 2010), there may still be content that is considered inappropriate to share with an outside community. Although some form of security for sensitive content is necessary, the more difficult issue arises around how to determine what content should be secured. The protocols for Native American Archival materials state the following: “Consult with culturally affiliated community representatives to identify those materials that are culturally sensitive and develop procedures for access to and use of those materials” (First Archivists Circle, 2006), so the security used in the Sahaptin Archive requires the oversight and curation of community members. Various members of the Yakama Tribal and General councils notified about the projects by phone with multiple voicemails as well as emails when available. Multiple messages were sent monthly over a ten month period, but unfortunately, I was unable to receive a response from anyone involved with the councils or Yakama government by the time the beta archive was launched. Other local stakeholders (§6.2.5 & §6.6.1), including Sahaptin instructors and the original creators of the course were all interviewed regarding this and other issues. These stakeholders recommended additional people to contact who were related to the local government but all expressed skepticism that I would receive any response as they themselves found it difficult to get to a response, even though they were in-group members. By the end of the project, I still had been unable to get a response from anyone directly involved with the Yakama Nation government (§6.7.3.4). And so, I decided on the recommendation of Dr. Beavert that the primary oversight for the projects come from key community stakeholders she designated.

#### 5.4.2. *Data integrity*

Security issues for the archive and course are crucial topics of concern and were included in the needs analysis. Christen (2011) reminds us that the structure of community involvement and oversight for the course and the archive need to be resolved before an archive can be considered secure. The needs analysis data seemed to support the existing password security structure of the Sahaptin Archive (§6.6.3), but there is still the question of who should be in charge of distributing and maintaining the passwords. Also, should community members be able to annotate and curate the materials in the archive or should the archive remain static with the sole control being related to access?

The Open Archival Information System (CCSDS, 2012) standards prioritize authenticity and consistency or accuracy of the data. Therefore, removal or editing of the core documents goes against the standard. An OAIS archive must ensure that information “is never deleted unless allowed as part of an approved strategy. There should be no ad-hoc deletions.” (CCSDS, 2012: s3 p1) However, editing or management of security and the metadata, as well as annotations or corrections, are accepted provided producers (i.e., editors) follow the prescribed submission agreement (CCSDS, 2012: s2 p9). The submission agreement, in the case of the Sahaptin Archive, clearly outlines the types of edits and additions to the accompanying CMS-based (i.e., not the PDFs) content (e.g., metadata, annotations) and can be accessed by anyone given the proper permissions.<sup>86</sup>

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<sup>86</sup> While the system developed for this temporary archive attempts to adhere to the processes laid out by the OAIS, many of the processes have been combined and simplified where appropriate for efficiency and due to the practicalities of the tools available.

## 5.5. METHODOLOGY

### 5.5.1. *Labelling*

Bird & Simons (2003) describe the seven pillars of archiving as “content, format, discovery, access, citation, preservation, and rights” while Johnson (2004) argues for an eighth pillar, *labeling*, saying, “Nothing could possibly be more important than labelling every single item you produce—each track, tape, disc, notebook, digital file, photograph—with RUTHLESS CONSISTENCY” (8). As such, the labelling system for the Sahaptin Archive now exists at four primary levels:

**Level 1, Filename labeling**, which uses the following conventions:

EXAMPLE: S\_A-0058-Alphabet\_Workbook.pdf

GLOSS: 1\_2\_3-4.pdf

- 1: (S = Sahaptin).<sup>87</sup> While largely redundant, this name is intended to anchor each file within the larger collection.
- 2: This position contains a character or two relating to the primary category of the material. (e.g., A = Alphabet, C = Culture, S = Songs, P = Prayers, etc.)
- 3: This position is an arbitrary four digit code used to link the material to the online database.
- 4: This position is for a short name used to roughly describe the material.

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<sup>87</sup> The use of a three letter ISO language code was decided against to minimize the filename length, because the archive will only contain a single language, and because the Linguist List standard (qot) will likely not improve the clarity for the majority of users and future administrators. However, the ISO code for the dialect (ISO 639-3: yak) was used in the OLAC metadata tags where appropriate.

The entire **filename** serves as a unique identifier in the system and XML. The filename should be located within the following XML tag set:

```
<dcterms:identifier xsi:type="dcterms:URI">Example Identifier</dcterms:identifier>
```

**Level 2, Folders**, which serve as a redundant organization of the materials within their larger categories. In addition to files being stored in the online CMS, all files are stored on the development computer and backed up on various servers. Outside of the CMS, all files are stored in a file folder structure corresponding to the larger categories and noted in an online material overview database (Google Apps Spreadsheet).

**Level 3, Online labeling**, which provides ease of access. There was little consistency to the original organization of the materials, so the slightly arbitrary labeling of the filenames is the result of the variety and complexity of the materials delivered to the UW. The bulk of the labeling, therefore, resides in the online archive CMS in order to take advantage of a combination of single grouping labels (categories), overlapping labels (tags), and additional metadata related to the PDF (e.g., the hexadecimal code linked to the file name).<sup>88</sup> The metadata may overlap with the tags or categories assigned to each resource in the CMS, which will be discussed later on. During the initial sorting of the paper materials it was not always possible to situate a resource into a single category (§5.3.3). In the end, a primary category was assigned to every resource and used for the file name label, but in the online archive, related categories and more specific descriptors

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<sup>88</sup> The OAIS would define this as an identifier related to ‘Reference’ as part of the “Preservation Description Information.”

could be added. The *bundling* (Johnson, 2004: 9) of the various related materials was done using tags in the CMS to allow multiple and more targeted bundles for a single resource.

**Level 4, The Uniform Resource Identifier (URI)**, which identifies each archived resource. Steps were taken to follow URIs specifications (Borghoff et al., 2005) and Linked Data standards were adhered to as closely as possible. The Filenames described in (1), above, account for the Uniform Resource Names (URN), which is the primary URI, with Uniform Resource Locators (URL) acting as a backup identifier. The URN is then assigned to the file and added to the online material database (Google Drive Spreadsheet) and metadata and the CMS site. The CMS that the temporary archive is using is WordPress, which automatically generates a URL for each post associated with a resource, though the URL (i.e., also “permalink” in WordPress parlance) could also be manually specified.

Thus, instead of having an auto-generated URL using the title of a resource (e.g., <http://depts.washington.edu/sahteach/handout-and-homework-the-use-of-mish-and-kam/>) the URN could be substituted for the title or for any other default URL pattern, which would result in something like the following: [http://depts.washington.edu/sahteach/S\\_T-0056-Handout\\_Mish\\_-Kan/](http://depts.washington.edu/sahteach/S_T-0056-Handout_Mish_-Kan/)

A permanent archive could, should they deem it worthwhile, fairly easily reconstruct the structure of the temporary archive (minimally “disrupting” the URN/URL pattern) by swapping out the URL content prior to the URN (e.g.,

<http://depts.washington.edu/sahteach/>). On the other hand, if the default URL setup is used where the title of the resource is used to generate the full URL for the post, the title is included in the metadata and, barring any special character conflicts, a script could be written to keep the URL and URNs more consistent. In the end, the extensive metadata, file naming and the online material overview database (Google Apps Spreadsheet) info may be more than enough for a permanent archive to efficiently intake the content, and added redundancy will be no more than a few added clicks.<sup>89</sup>

### 5.5.2. *Content management system*

This section describes the reasoning behind selecting the Content Management System (CMS) as the primary platform for the temporary archive. The types of materials contained in the archive differ in format from the content usually found in major online language documentation archives. Crucially, the Sahaptin materials lack the naturally produced language (e.g., texts) or pure linguistic documentation (e.g., grammars and lexicons) often seen in major archives. The materials were designed, collected and organized with the single goal of pedagogy in mind, so a stand-alone temporary archive<sup>90</sup> was selected to better accommodate the format and genre of the content. Based on a brief anecdotal survey, similar community-based archival efforts have much in common with the Sahaptin archive such that using an isolated stand-alone archive that could be transferred to a permanent archive at a later time offers advantages for production, management and make the archived materials available to community members sooner.

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<sup>89</sup> Manually altering the permalink requires two additional clicks and one copy and paste of the URN during the post building process, which is discussed later.

<sup>90</sup> In other words, the majority of archives where the materials could be deposited were primarily housing non-pedagogical language materials. Because of the need for ease of access and flexibility it seemed like the best course of action was to create a separate, temporary, home for the materials.

The temporary archive strives to conform to the Open Archival Information System (OAIS) (CCSDS, 2012) whereby a primary goal is to preserve the materials for the ‘long-term’. The OAIS standards describe ‘long-term’ as potentially indefinite, but the Content Management System (CMS) deployed version of the archive is not a feasible long-term solution in the case of the Sahaptin material for a variety of reasons, including the lack of a dedicated, long-term archivist. Therefore, the permanent archive will need to be responsible for the indefinite storage of the materials in a way that is fitting considering the limited parameters, and the OAIS standard of long-term should apply to the CMS archive in the sense that it should be made as perpetual as possible.

To conform to the OAIS, a concerted effort was made to develop an archive and management system that was “Independently understandable” (CCSDS, 2012: s3 p1) in regards to access or being ‘designated’ to the community. It is vital the materials deemed appropriate for distribution (§5.5) are easily accessible to the community and that the stand-alone option allow for the navigation and presentation of more colloquial, less technical (e.g., linguistic) jargon. Ideally, the successful accessibility aspects of the short-term archive will be present in the permanent archive as well.

For this project, the WordPress Content Management System (CMS) was selected, though other CMSs offering expanded functionality might be worth investigating for other projects. For example, Drupal’s extensive user and permission system could be useful for more extensive archiving projects or for projects with more people working on system administration and content submission/curation. WordPress, though, met the less extensive requirements of the Sahaptin Learning Materials archive and, as such, would be a good fit for other similar archives.

As of 2014, WordPress was the most frequently used CMS in the world (Builtwith.com, 2014), and this widespread usage correlates into substantial support options, including documentation and forums, and arguably requires less technical expertise to install and manage than some other CMSs (e.g., Drupal, Joomla). WordPress is easily updated through the in-browser administrative interface and can be password protected at the site and page/post levels, though multiple users accessing pages for editing purposes will require some form of rollback (e.g., WordPress *revisions*).

When it comes to features related to archive distribution, WordPress supports the tagging and categorization of posts. Since each resource is associated with an individual post, the tags and categories are easily assigned to the resource, and they are then included in the search function, and may be explored and displayed in a variety of ways.

Future migration of the archive was also considered when WordPress was selected as the CMS for this archive. WordPress uses MySQL for its database, so when it is transferred to a permanent archive the full data (e.g., the PDFs, texts, tags, etc.) could then be extracted and, with a bit of scripting, relatively quickly transferred into the new archive. However, it is important to note that if automated backups are not performed on the server side, a backup plugin should be installed (e.g., UpdraftPlus<sup>91</sup>) to regularly create offsite backups of the system and archive content.

Some additional plugins were also be of use to this and may be valuable for other archives, including those that do the following: index PDFs for searching (e.g., SearchWP); truncate posts in the search results (e.g., Post Teaser); embed and display the PDFs inside each

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<sup>91</sup> UpdraftPlus on the temporary archive is configured to regularly back up the entire archive to Google Drive.

post (e.g., Spiderpowa Embed PDF); automatically format the XML metadata (e.g., SyntaxHighlighter Evolved); and embed audio for streaming or streaming-like<sup>92</sup> behavior (e.g., HTML5 jQuery Audio).

There are some alternatives to the WordPress system described in this chapter that may better suit certain archival efforts. One example of this is Omeka (2007), which is a CMS that is dedicated to the purpose of archiving and exhibiting digital collections online. By default it supports the basic set of Dublin Core metadata, but it can be extended to include the full set. It does not currently support OLAC metadata tags, however. In addition, it supports, with additional plugins, PDF embedding (i.e., Docs Viewer) and has some extensive security functionality. The more wide-spread support for WordPress, the flexibility the system offers, and the slightly more efficient work flow for this particular archive, led it to being selected. That being said, Omeka is a powerful tool that any other communities should investigate when considering a CMS for online archiving and distribution.

### 5.5.3. *User interface, design & accessibility*

Another topic that deserves consideration is accessibility as it relates to user interface (UI) and aesthetics. Archives can have an enormous set of complicated data, not all of which is very friendly to human readers. In order to make the short term archive as usable as possible it was important to make it relatively aesthetically pleasing to visitors so that they would not be overwhelmed, or simply bored, by the content. Also, the content should be packaged in a way that shows respect to the creators of the content and the community it represents. A fairly easy and inexpensive solution was to purchase a single high resolution image of some nature near the

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<sup>92</sup> “Streaming-like” as used here, refers to buffered playback of media through a browser without requiring a manual download and play by the user. To the user, the experience is similar to streaming.

Yakama community from a reputable stock photography company and use it as an entry header and site footer.

More modifications to the CMS were required as well in order to streamline the UI for the specific purpose of the archive. Once a base WordPress theme has been chosen, a child theme must be immediately created so that future updates will not destroy any modifications made up to that point. After the child theme was created, all of the basic functionality and auto-generated content (e.g., calendars) were removed excluding a limited core set (e.g., menu bar, search box). The content that was featured on the main page was limited to some brief information about the archive, a link to a page with all of the categories for the content, links to pages on 'How to use this archive' and 'The History of the archive', an auto-updated list of recent additions to the archive (to inform as well as highlight growth), and below the initial screen a set of links to related resources. The 'How to use this archive' page provides detailed explanations for people trying to find content (via labelling (§5.6.1)), as well as guides on adding or transferring content. Some redundancy was added to the interface, such that the header and footer on every page provided access to the tag and category links. Since the needs analysis resulted in no interest in having mobile support for the archive and because the archive will eventually find a permanent home, time was not invested in making the theme mobile-friendly. Finally, every theme tested for the archive required substantial modification of the CSS for the fonts. A special set of CSS styles needed to be constructed to display certain Sahaptin characters correctly. Again, because it is easy to overload the user with too much content, it is important to utilize font sizing, spacing and padding appropriately. A well-constructed child theme with robust CSS can provide additional longevity and portability of the archive.

#### 5.5.4. *Access controls & security*

Because some of the content in an archive may be information the community wishes to protect, a form of access control needs to be provided. Christen (2011) discussed this issue in her work on the Mukurtu Wumpurrarni-kari Archive, stating that the needs of the community as well as the sensitivity and complexity of the archive necessitated a tiered, or granular, permission structure. Some Mukurtu Wumpurrarni-kari materials, for instance, needed to be restricted such that they would only be accessible by women in the community. In the Sahaptin Archive, the limited content type and concerns over long term maintenance led us to choose WordPress as the archive's CMS because WordPress allowed two permission tiers. Should site-wide password protection be needed at some point, the entire installation could be protected with an .htaccess file with an additional public intro page describing the archive and access information. The password protection of individual posts and of the site as a whole could then require some degree of moderation or administration, especially in the provision of access to new users or in instances of password change if the site became compromised. For the sake of local control, engaged community members would be ideal for this role. Johnson provides another perspective on the issue of preservation versus accessibility, stating, "Archived materials are public goods, even when access is restricted to protect the rights or wishes of the speakers whose words are recorded therein" (Johnson, 2004: 3). Again, communities where multiple editing accounts are required should consider the functionality options of other CMSs (e.g., Drupal) as well.

While restricting access to certain content is important, nearly all digitized content, once made accessible, can find its way outside of the control of the archive as "true security would entail not allowing one's data on the Internet" or on any computer connected to the internet (Wolf, 2008: 140). Wolf argues that security for Indigenous resources hosted online is an

imperative, recommending precautions such as geographical (IP-based) restriction, SSL encryption, etc. However, security must be balanced with accessibility, something Wolf addresses as well. Another concern is that some communities may need to consider the costs, whether financial or required expertise, involved in options like SSL.

For this reason, it is often best to utilize techniques that could slow down or frustrate pirates. For example, each resource in the Sahaptin Archive was given its own page (or, 'post' in WordPress parlance) making it much less convenient for someone to program a script that could spider the page and automatically download each PDF.<sup>93</sup> The PDFs were then embedded for display in the browser, another function which should discourage unauthorized downloading.

It is possible to protect things at the file level outside of WordPress as well, so an added benefit of the PDF format is that proprietary software (e.g., Adobe Acrobat) can be used to restrict access with encryption. Currently, for the PDF format using Adobe Acrobat there are three options for encryption available: Password encryption, Public Key Infrastructure (PKI) encryption, and Rights Management. The last of these might be a useful option for Indigenous organizations wishing to restrict access to a particular physical environment, on say, an internal network.

Determining which Sahaptin resources contained sensitive information went beyond my expertise, as I am not a member of the Yakama community. And it is important to remember that even within a given community, there is always a chance of disagreement or gradual attitude

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<sup>93</sup> Again, this won't prevent spidering, but the URLs are generated by the Wordpress system and there is no default page with all of the data, PDFs, or links to the resource pages. Therefore some manipulation of the search engine would be required to spider the majority of the content, as there are limited results per page, and password restrictions at the search result level.

change over time. For this reason, the Sahaptin Archive was initially developed with an option for members of the community to request that content become protected with a password so any documents containing potentially sensitive cultural material in the pilot phase could be password protected as a default. Additional guidance on the archive and security was a key goal of the needs analysis (Ch. 6). Participants of the needs analysis were shown various examples from the archive and asked whether they should be protected or not.

In the end, it is important to carefully weigh the situation before placing strong restrictions on content. Even if content is restricted to a few people in a community, it is necessary that it be as accessible as possible to those people. Edmondson's report for UNESCO makes the following point:

*“Preservation and access are two sides of the same coin. For convenience they are considered separately in the following discussion, but they are so interdependent that access can be seen as an integral part of preservation. Indeed, the widest definition of preservation embraces almost the totality of an archive’s curatorial functions... Preservation is necessary to ensure permanent accessibility; yet preservation is not an end in itself. Without the objective of access it has no point. Both terms have a wide spectrum of meaning, however, and tend to mean different things to professionals in different situations.”* (Edmondson & UNESCO, 2004:19)

#### 5.5.5. *Embedding and streaming audio*

Returning to the issue of audio files in the temporary archive, it would be ideal to have the master archival file also be streamable or playable in a web browser, similar to the method of embedding the PDF discussed above. Thus, in a perfect world, the audio master that is encoded

as a FLAC and tagged would also be playable in a browser. One recommendation for this is to encapsulate a FLAC encoded file into an Ogg container (Xiph.Org, 2013; Xiph.Org Foundation, 2014a). At this time, however, this technique is not widely supported and WordPress does not offer any stable plugins for this purpose. For most communities, this option may not be feasible depending on the resources available. This leaves two primary remaining options. The first is to simply require the user to download the FLAC before listening to it. The second option is to encode a second file in the lossy MP3 or Ogg Vorbis file format and embed it into the WordPress site (using a plugin like *HTML5 jQuery Audio*) accompanying the downloadable FLAC file. Crucially, the lossy files must be kept separate from the actual archive data structure. Although this adds a few additional steps and clutters the temporary archive it has an additional advantage in that the reduced size of the lossy file will be more accessible to communities with poor or unreliable internet access. While it is dependent on the bit rate at which the lossy file is encoded, the reduction in file size from a FLAC to an MP3 could be more than 50%.

#### 5.5.6. *Collaborative editing for transcripts and error corrections*

While a transcript can be easily added so that it accompanies its associated audio resource in an online system like the one being described in this chapter, the issue of facilitating collaboration on such a system is not so straightforward. WordPress has multiple user roles but for the collaborative functionality that might be required for documents like transcripts there are only two relevant roles: *Administrator* and *Editor*.<sup>94</sup> Both roles have permission to edit any existing post, with administrators having access to additional system options. This means that an editing user cannot be granted permission to edit a single page/post, or a section of one, they

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<sup>94</sup> Users assigned any of the other editing roles can only edit posts the same user created.

must either have access to all of the content in the site or only have the option to create new pages. For smaller communities where there will only be a few trusted people editing the site this should not be a problem. However, if a more robust set of user permissions is required, another CMS, such as Drupal might be preferable. WordPress does, by default, retain the last 25 revisions to any page in the site, so unless a user takes the time to maliciously edit a page 25 times and no recent back up was made, there should be very little risk of data loss using this method.

Another way to address collaboration could be to utilize a wiki. For example, an installation of MediaWiki could be deployed solely for these purposes, while for smaller archives, Google Drive could be used, with attendant issues of control of the data. Each resource entry URL/URI in the WordPress archive could have a link to a page in the wiki where the transcript would reside. Or, after a transcript that has been edited in the wiki is deemed suitable for the archive, the text could be migrated to the WordPress site for visitors to access. The benefit of this method would be to limit access to editing the core WordPress data. On the other hand, this would add some unnecessary disconnect and spread of the data, which could add unwanted complication when data is migrated to a permanent archive as there would be two databases (one for the Wiki and one for the WordPress installation) that would need to be joined. There is also a risk of content being added in the wrong location or extra redundancy. In addition, locating transcripts in an external system limits the power of the CMS search engine.<sup>95</sup> If a transcript

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<sup>95</sup> It is not a simple task to setup a Wordpress search box which has indexed the content of a separate MediaWiki installation as well as the Wordpress content. Even if it was setup properly, either the user would be directed to the MediaWiki transcript page, thus leaving the system and having incomplete info on the resource, or it would direct them to the Wordpress resource page where the transcript text from the search that prompted them to click the link would be absent, as it is stored on the MediaWiki page, separate from the primary resource page in Wordpress.

accompanies the URL/URI for the resource in the CMS then each word will be indexed. Hypothetically, extremely extensive data could clutter the search database, but with tags and categories as alternative routes to resources, this is not as much of a concern for the type of archive in question. There are some plugins available for WordPress that provide wiki-like functionality within the system, but currently, none of them integrate the content into existing posts, and the only plugin with reasonable support and positive reviews would be cost-prohibitive for most communities.

One of the benefits of existing collaborative software options is the ability for users to comment on the content and edits. If this is crucial functionality for a community, external systems could be used or a plugin for this purpose may be developed at that time. In the end, the existing revision functionality in WordPress was judged to be preferable for this archive as it allows all of the content for a resource to be located under a single URL/URI and it reduces the amount of software, plugin or server support and maintenance that will be required.

Labelling relevant to the Indigenous community but potentially outside of a standard metadata schema also can be added to the resource's respective post (Toner, 2003). As discussed earlier, the original learning materials sometimes contained errors or required additional notes. If the notes and corrections are reasonably few they can be added to the metadata and description for the resource, but if extensive they should be listed in section for corrections above the metadata block on the post/page. Although the long-term feasibility is questionable, an additional step to improve the usability of the resource would be to add corrections to the PDF itself using the comment and text box functionality. This method, however, does severely hinder collaboration as the edited PDF must be re-uploaded to the WordPress system and the URL to

the file updated in the metadata if it is not replaced. Because there is no online logging for the edits or check-in/check-out functionality this method should probably be considered only as something to be done in addition to the corrections text accompanying the metadata on the WordPress post. It should be noted that if errors are plentiful for a particular resource, barring a substantial reduction of quality, the original resource should be corrected in the PDF and then added to the post and metadata with the same URI/filename with some additional text in the filename marking it as corrected (e.g., ‘\_updated\_date’).

At this point, there is still the issue of how to display corrections if they are disconnected from the actual image of the resource (i.e., in the PDF). For example, one option would be to list the page number and the line where the error is found, write the error, and then have the correction or corrected text immediately following it. If possible, it is ideal to have some distinguishable string of Unicode text that can be found via search, within the browser for the post and within the PDF viewer for the actual resource. This refers to situations where a string of Sahaptin that is not either not search friendly in the browser or OCR was not successfully ran on the PDF. If this string of text is located within a resource of 50 pages and 100 lines per page, finding the location of the error without the page and line number location could be incredibly cumbersome.<sup>96</sup> Thus, if the incorrect text could be located via a search it would be ideal. If the string immediately containing the error is not searchable, then a neighboring chunk of text that is searchable, and as unique as possible,<sup>97</sup> should be included in the ‘error string’ on the resource page.

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<sup>96</sup> The average page length for each of the resources in the Sahaptin archive is around five pages.

<sup>97</sup> E.g., the two word chunk ‘velvet cake’ is likely more unique than ‘it is’.

The final set up implemented for the online archive was the addition of three presentational boxes for audio transcriptions, “Retyped” (PDF to Unicode) transcriptions, and annotations. Each box type is color coded and located immediately below the display for the resource (e.g., the embedded PDF). The Unicode transcription box is a place where text on a PDF that isn’t machine readable can be posted in a machine readable (i.e., Unicode) form. If a document has had partially successful optical character recognition ran on it then that text could be corrected in a text editor and added to the resource page. If a document was hand written it requires a full manual transcription. While corrections and annotations should be noted in a correction/annotation box, ideally, the text in this box should incorporate the corrected and properly annotated text (i.e., be the most accurate version of the document possible).<sup>98</sup> While the majority of Sahaptin characters will render properly in a text-editor and HTML, X will not render properly in HTML when copied from a word processor. Instead it will generate the underline on the following space or character. However, if you have a standard Sahaptin keyboard and font installed you can copy and paste the text back into a word processor and the underline should display correctly again under the X.

In the end, these decisions related to annotations and curation are for each community to make depending on the types of resources and errors involved, although the above method seems to be a suitable solution to the problem for the Sahaptin archive.

#### 5.5.7. *Long term archiving*

The recent CCSDS recommendations document for OAIS (CCSDS, 2012) describes some of the current challenges for ‘long-term’ archives. The most crucial of these considerations

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<sup>98</sup> The corrected version and annotation sections for a resource in the temporary archive website can be edited at any point by an administrator.

are data corruption, hardware failure and hardware obsolescence. As all of these will likely be of concern to the permanent archive, regular backups of the MySQL data will be made on dedicated servers hosted by the UW to better compensate for these issues on the CMS hosted short term archive.<sup>99</sup> However, it should be emphasized again that these problems will arise eventually for any community that wishes to internally manage an archive without the support of a ‘permanent’ archival institution, whether external or internal to the community, underscoring the definition ‘short term’.

In order to better account for these risks and problems all documents in the Sahaptin archive were labeled and organized into folders, along with a dump of the launched archive, and packaged into a single compressed file to be: 1) kept by the online archive builder; 2) put into some form of cloud storage (e.g., Google Drive); and 3) shared with interested related institutions (e.g., The Yakama Nation, The Northwest Indian Language Institute (NILI), Heritage University). Regular XML exports of the metadata and annotations, if updates are made, will then be easy to provide to the permanent archive. Other community-based, or isolated, ‘short term’ archives should follow the steps above or something similar.

#### 5.5.8. *Metadata*

This section describes the metadata standards adopted for the Sahaptin archive and some of the key challenges I faced when investigating and implementing the options. The Metadata in the temporary online archive is primarily based on Dublin Core Metadata Initiative (DCMI)

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<sup>99</sup> The MySQL data contains all of the metadata, corrections and annotations associated with the archive. It is a relatively portable database format. Should issues arise (e.g., hardware failure) it can be restored or migrated with a little effort (§4.1.6).

(DCMI, 2014) standards, which are commonly used for similar archives (e.g., Christen, 2011).<sup>100</sup> In addition, any data points not covered by Dublin Core are covered by Open Language Archive Community (OLAC) standards (<http://www.language-archives.org/documents.html#Standards>).

Borghoff et al. (2005) argue “robustness must take priority over efficiency” (50) with respect to metadata projects destined for long-term archiving. However, in the case of this project where there were very limited time and resources, an extreme reduction in efficiency (e.g., adding many more steps to the process) would have slowed down or prevented the completion of the archive. In order to capture the materials’ core information without cluttering the database with tags marked unknown, a balanced core set of metadata tags were developed (Theodore Gerontakos, personal communication).

#### 5.5.8.1. *The XML and metadata management application*

Each resource or item in the archive needed to have accompanying information (metadata) in Extensible Markup Language (XML) in order to transmit information to current and future users and to distribution systems/archives as effectively as possible. To a human reader, XML is less felicitous. Editing XML manually is a time consuming process and the potential for errors is high.

After the initial metadata XML structure was developed, some metadata completion software options were recommended (Theodore Gerontakos, personal communication), which guide the user through the fields and limit errors, but the effective software was priced far beyond the means of this project and is likely also for many communities with limited resources.

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<sup>100</sup> Thank you to Theodore Gerontakos and Dan Mandeville for their generous help and suggestions regarding the metadata template.

Therefore, it became necessary to develop a PHP-based online application that provided the necessary functionality for a project of this more limited scope. The first version of the application provided fields for the user to complete on the left-hand side of the screen. When the necessary fields were completed, the user clicked submit and the system exported the metadata with the correct info. Unless there were major errors in the input fields, every export fully met the W3C XML standards. This code could then be copied and pasted into the appropriate WordPress post field. After completing the system, the entire process needed to be reviewed by a third party<sup>101</sup> who is familiar with archiving and metadata standards for potential errors. Soon after, it became clear that with a minimal expansion of the fields and scripts the system could handle the entire code set (e.g., title, PDF link, embedded PDF code, general formatting) for each WordPress post. I then reworked the XML application into the 'Post Builder', reusing some metadata input fields and adding in others. The final application outputs a single chunk of code such that no edits were required in the WordPress post's description box after the generated code was posted within, thereby reducing the risk of error and the number of steps required to add a single resource.<sup>102</sup>

Most of the code generated will never need to be altered (e.g., the Dublin Core and OLAC declarations), but the input fields in the generator represent the XML tags that are most likely to be altered for the purposes of this archive and are arranged in the predicted frequency

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<sup>101</sup> Again, Theodore Gerontakos, personal communication.

<sup>102</sup> PHP, unfortunately, does not have a quick way of sending echoed text, or text in a div, to the clipboard. HTML and Javascript options are not well supported cross-browser. Flash based clipboard scripts also have support and security issues. Thus, for the sake of limited maintenance and better security, the selecting and copying must be done manually. The text of the exported XML is generated with an especially small font size in order to make the process of selecting and copying easier and quicker. If it necessary to examine the generated code, it can be pasted into a text editor or Wordpress.

for which they will be edited (i.e., top=more, bottom=less). Any tags that are not represented with a field may also be edited manually after the generation process. The system is a mix of PHP, HTML and CSS and is intended for portability and ease of modification. The entire application, excluding the help page, is contained in a single PHP file and stored with the archive.<sup>103</sup>

Using text resources as an example, the final workflow for the archive is as follows:

1. Open an unarchived PDF.
2. In the Google Drive Spreadsheet (§5.5.1),<sup>104</sup> create a new name (URN) for the resource.
3. Change the name of the PDF (§5.5.1) and move it to the appropriate folder.
4. Upload the PDF to WordPress.
5. Copy the URL of the PDF stored in the WordPress installation.
6. Paste the URL and URN into the Post Builder system.
7. Complete all of the fields that are relevant to the resource. Most likely, the user of the Post Builder system will never need to edit the Linguistic field, Subject or Type. These are set to default values and may be left as is unless they need to be changed. Complete at least Title, Date and Description and then as many other fields that are relevant to the resource.

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<sup>103</sup> The modified theme and XML postbuilder web application code have been posted on the archive's website for those interested in starting a similar archive to take and modify as needed.  
<http://depts.washington.edu/sahteach/introduction/how-to-use-the-archive/#start>

<sup>104</sup> This spreadsheet is a redundant knowledge base to stream line the administrative process. It will not be required for the archive in the long term.

8. Click Submit.
9. After the code is generated,<sup>105</sup> select all of the text and copy it (right-click 'copy' or ctrl-c).
10. Paste it into the WordPress (the main archive site) Post field at the bottom of the entry.
11. Enter the title of the resource for the WordPress post.
12. Edit the permalink, paste the URN, and click *OK*. (This step creates the URI)
13. Add all appropriate tags and set the category.<sup>106</sup>
14. Click Update.

#### 5.5.8.2. *Post builder input field descriptions*

Below are simplified descriptions of the fields and how they relate to the metadata.<sup>107</sup>

**Title:** The name of the resource.

**Date:** The date the resource was created. If the resource was created in 1995 but incorporates another resource (say, a text from 1918), use the most recent creation date in this field and then enter the older date in the Additional Date field. Acceptable formats for the date can be found here: <http://www.w3.org/TR/NOTE-datetime>

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<sup>105</sup> This code could be considered as a Submission Information Package (SIP) following (OAIS) standards (Borghoff, Rodig, Scheffczyk, & Schmitz, 2005).

<sup>106</sup> Wordpress supplies a full list of tags and autosuggests existing tags when the user is adding them. Some of the initial set of tags came from the sorting process as they were the subcategories for items that did not have enough resources to justify an entire category. Others are simply redundant with the categories for resources that fit a primary and secondary category. Administrators are able to enter in new tags as well at this point that will be autosuggested to future users.

<sup>107</sup> Descriptions of these fields can be found on the post builder's help page: <http://depts.washington.edu/sahteach/postbuilderhelp.php>

**Description:** Any additional info about the resource. For example, a sub-title might go here.

**Resource URL:** This is the URL for the file once it has been added to the online (WordPress) system.

**Resource Filename:** This is the URN, or filename without the filename extension. For example:  
<dcterms:identifier xsi:type="dcterms:URI">S\_L-0059-Early\_Dictionary</dcterms:identifier>

**Type:** The type of physical resource. Is it a text (paper, book), sound (audio recording), etc.?

**Linguistic Type:** The type of resource linguistically, primarily related to language documentation. See here for explanations of each of the options: <http://www.language-archives.org/REC/type.html>

**Format:** The digital format of the resource. See for more info:  
<http://dublincore.org/documents/2012/06/14/dcmi-terms/?v=elements#format>

**Table of Contents:** If the resource has sub-units, such as chapters, they are listed here.

**Linguistic Field:** This is the sub-field that is associated with the resource. Most likely it will be applied\_linguistics. See here for more info: <http://www.language-archives.org/REC/field.html>

**Subject:** The subject of the resource, most likely 'Teaching the Sahaptin/Yakama Language'

**Publisher:** If no publisher exists, leave blank.

**Speaker name:** For audio recordings and transcribed speech, enter the speaker's name here.

**Extra Depositor Name:** If you are not one of the original workers on the project (Virginia Beavert, Edward James, etc.) enter your full name here.

**Additional Date:** see (Date) above.

**Restricted Access:** Check this box if the resource has sensitive content and should be restricted such that only members of the Yakama Nation can access it. Checking this box does not secure the content. It only informs future archives that it should be secured. Any current archive systems will have to restrict the content in their own way.

#### 5.5.8.3. *Additional metadata Info*

The system also needs to declare in the metadata the *subject* language of the resource and the language the resource is written *in*. If the resource is written *about* the language, the following tag is used:

```
<dc:subject xsi:type="olac:language" olac:code="yak" />
```

If the resource is written *in* the language (e.g., Yakama), the following tag is used:

```
<dc:language xsi:type="olac:language" olac:code="yak"/>
```

OLAC argues for the use of the *contributor* tag in place of a *creator* tag as well, claiming, the “Recommended best practice is to use the Contributor element instead of Creator, except in cases where there is significant creative involvement by the person or organization and there is no suitable refinement term from the *olac:role* scheme to use with Contributor.”

<http://www.language-archives.org/NOTE/usage.html#Contributor><sup>108</sup>

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<sup>108</sup> “Generally, copyright protection extends to two elements in a sound recording: (1) the contribution of the performer(s) whose performance is captured and (2) the contribution of the person or persons responsible for capturing and processing the sounds to make the final recording... Under the 1976 Copyright Act, which became effective January 1, 1978, a work is automatically protected by copyright when it is created” (United States Copyright Office, 2014, p. 1).

Because authorship of all of the materials is unknown, the rights holder tag was omitted, but Dr. Virginia Beavert is listed as the compiler of the materials. Another potentially gray area was the code for the *linguistic-field* tag, for which OLAC provides the following clarification:

“Language Acquisition may be used to describe materials relating to either adult or child language acquisition, and to either first or later language acquisition. However, if the materials deal specifically with language teaching, or with the process of language learning from a pedagogical point of view, they may be best classified as Applied Linguistics.”

<http://www.language-archives.org/REC/field.html>

The development process for the online temporary archive reinforced the value of flexibility. Being able to alter the majority of the layout and functionality was an enormous asset for making the completion of the project more feasible as well as for improving the presentation of the content and general user interface. While many of the goals (§4.1.1) were understood prior to the start of development (e.g., support for migration (§4.1.6) and collaboration (§4.1.5)), some new goals became apparent through experimenting with the system and the data. For example, there was a much greater degree of support for metadata entry and management than I initially assumed (§5.5.8). The system for the collaborative editing of the resources (§5.5.6) also went through multiple, considerably different, variations until it became clear what would be most suitable through actual trial and error with the options. While there is a place for more standardized CMS's for Indigenous knowledge collection, preservation and presentation, a more flexible option may better suit many communities and projects (§5.5.2). The finalized temporary archive system is far from perfect, especially with regards to tiered access (§5.5.4), but it should provide a fairly clean path for migration when a suitable replacement application arrives.

## 5.6. CHAPTER SUMMARY

This chapter began with a brief description of the Sahaptin language and the Yakama dialect. The Yakama Nation is situated in a relatively sparsely populated area with limited economic resources. In the town of Toppenish, which is the largest city within the borders of the Yakama reservation, the Indigenous population makes up only 8% of the population . Opportunities to learn the language are limited, but do exist in the K-12 system and at Heritage University. The materials described in this chapter were created for use in classes at Heritage University and were donated for preservation by Dean Mary James of the same institution. The archive and course projects described in this dissertation were designed to support the Sahaptin courses at Heritage as well as the local community. This background was intended to illustrate some of the factors affecting the community as well as to highlight the value of leveraging resources from other institutions (e.g., UW), in addition to the need for low-cost technology to increase access to educational opportunities.

The remainder of this chapter describes a single case of constructing a short-term archive as a staging platform for a long-term or permanent archive. Depending on the flexibility of the future archive, the short-term archive may exist after the materials have been transferred if the short-term archive continues to provide an advantage to the respective community (e.g., better accessibility). For communities interested in a similar archive for their materials, the system above is one possibility, though it is important to remember software and other options will change and that the community may need a more robust permission structure that other systems offer (i.e., similar to that of the CMS Drupal). However, the pilot of this system has been very promising and response by the community has been positive. If a community decides to pursue a similar archive and wishes to keep materials out of a permanent archive for control reasons, a

more extensive backup system will need to be implemented and much more careful migration planning undergone, as well.

While the metadata constructed by the Post Builder are not as complete as they could be, they do cover the key elements that the materials for this archive needed. There is also, undoubtedly, an advantage to keeping the database as clean and as well organized as possible in anticipation for the transfer to a permanent archive. After the post builder application was integrated, including the metadata into the process required few additional steps. Thus, it is completely feasible for any community to include metadata and follow the core Linked Data standard and OAIS protocols. With a basic understanding of HTML and PHP, the post builder application can be modified to suit the needs of any similarly scaled short-term archive.

## 6. YAKAMA SAHAPTIN NEEDS ANALYSIS

This chapter presents the background and data from a needs analysis (NA) that was conducted to guide the development of the archive (Ch. 5) and online course module (Ch. 7). The overarching motivation for the needs analysis came from an interest in making both products as useful as possible to the community as well as making sure there was appropriate community oversight. Community stakeholders, including educators, policy makers, and members of the Yakama Nation Tribal Council, were contacted regarding the study. The initial participating stakeholders also suggested other people to contact regarding participation in the study. The initial phases of the needs analysis involved a long-form qualitative (Kvale & Brinkmann, 2009) interview with 11 community stakeholders, who were primarily educators and language researchers. Based on the data from those interviews, an online questionnaire was constructed. A total of 36 participants completed the questionnaire. Three self-identified themselves as teachers, 26 as students, one as a researcher and the remainder as “other.” 23 respondents reported they were between 13-18 years of age.

In relation to language policy, curriculum renewal and development, as well as content access, this needs analysis investigates an Indigenous minority, which UW internal review board language describes as an *at-risk* population. While there is a broad range of literature to draw from for the first two of those topics, and a few projects on access, needs analysis literature discussing the intersection of these areas is very limited. Therefore, it was necessary to take a blended approach to the underlying theoretical and methodological frameworks for this needs analysis. This needs analysis primarily draws from the field of applied linguistics (e.g.,

Hutchinson and Waters, 1987), but because of the additional complexity of the community, models and concepts from other fields of study are utilized to support the project.

The aim of section 6.2 is to provide the reader with an overview of the various elements and models that guided the needs analysis. In addition to covering key terminology, the section also includes the literature that supports the broad structure and philosophical framework of the analysis. Section 6.3 contains the research questions and various sub-questions underpinning the needs analysis. The schedule and full design overview of the needs analysis is the focus of section 6.4, and section 6.5 touches on the interviewing methodology employed for much of the needs analysis data collection process. In section 6.6, the primary stakeholders will be introduced and background on the rest of the participants will be provided. The bulk of this chapter resides in section 6.7, which reviews the data from the needs analysis interviews and questionnaires. Conclusions are summarized in section 6.8. Based on the findings, a proposal born out of the needs analysis is presented in section 6.9 and section 6.10 contains a brief conclusion, bringing the chapter to a close.

## 6.1. BACKGROUND ON NEEDS ANALYSES

Below, 6.2.1 tries to answer the question “Why conduct a needs analysis?” and includes a brief history of NAs in related fields. The final needs analysis structure for this project was constructed using a hybrid of key models and definitions put forth by other researchers. In subsection 6.2.2, I review various definitions of *need* and how some particularly relevant researchers categorize and describe *need* in more detail. As some categorizations overlap to varying degrees, an exploration of how *need* is defined for the purposes of this needs analysis is included. Subsection 6.2.3 presents some examples of more broad and established needs analysis

and assessment models, including some important frameworks and philosophies that guided this needs analysis. The issues of politics and ethics are raised in subsection 6.2.4. While it is argued all NAs are political to some degree, it seems safe to declare that the context of this needs analysis brings additional political and ethical dimensions that need to be addressed.

Subsection 6.2.5 identifies the stakeholders and discusses how their data should be weighted while subsection 6.2.6 addresses the problem of the influence of the needs analysis conductor (i.e., here, the author) on the needs analysis and the stakeholder data. In subsection 6.2.7, there is a discussion of situational analyses (SA), specifically examining what is both feasible and vital when conducting a needs analysis similar to the one described in this chapter. Then, there is a short review of the concept of triangulation and how it relates to this needs analysis and SA in subsection 6.2.8. A brief summary of this section follows in subsection 6.2.9. The variety of perspectives presented in these introductory sections highlights the potential complexity of the interpretation and the potential for misanalysis of the data.

#### 6.1.1. *Why conduct a need(s) analysis/assessment?*

Conducting needs analyses or assessments for issues related to language has been given a fair amount of attention since the 1970s, and it was through the fields of English/Languages for Specific Purposes that initial efforts were undertaken. Later, work on discourse and register analysis (Richards, 2001; West, 1994) helped to expand the field, and soon after came the Munby model for profiling learner needs using macro and micro skill categories (Schutz & Derwing, 1981), a model which is now generally regarded as out of date.

More recently, Needs Analyses (NA) for language work has been defined with the purpose of curricula design and assessment. While both of these purposes are somewhat relevant

to the projects being undertaken for this dissertation, they do not account for the entire goal set of this needs analysis. However, this project is also concerned with curriculum renewal as it takes old materials and reworks them (Mickan, 2013; Richards, 2001).

Brown defines a needs analysis as “the systematic collection and analysis of all information necessary for defining a defensible curriculum. A *defensible curriculum* is one that satisfies the language learning and teaching requirements of the students and teachers within the context of particular institution(s) involved... Naturally, the *information necessary* to achieve this defensible curriculum includes all subjective and objective information, and any other types of information that turn out to be appropriate in the particular needs analysis” (2009:269–270). Brown’s reference to the value of both subjective and objective information was crucial for this needs analysis. Objective information, especially related to learner outcomes and assessment, is very difficult to come by, and a large portion of the topics of interest in this needs analysis are related to culture or attitudes, and are reliant upon subjective information. Overall, though, Brown’s definition is somewhat appropriate for the needs analysis described in this chapter in that one of the goals of the needs analysis was to develop a ‘defensible curriculum’ guide for the sample online course module (Ch. 7) and its future development, in addition to facilitating the content curation in the archive (§5.6.6). However, the creation of traditional curricula was not the NA’s main goal.

Rather, the main focus of this needs analysis was on the archiving of learning materials (Ch. 5) with special attention paid to related security and access issues (§5.6.4). Also, the institutional and instructional contexts of this needs analysis were much more difficult to define than many of the NAs reported in the literature cited in this chapter. The scope of the resource

development was much smaller in comparison, especially in relation to other NAs in the applied linguistics literature. For example, the existing Yakama language classes have very limited resources and utilize a wide variety of instructional styles and curricula. Because it's not feasible for the projects guided by the needs analysis to address each course, it's important to either make the resources as adaptable to all contexts as possible or to primarily address the contexts deemed to have the most need by the stakeholders (§6.2.5). While some detailed information on student abilities might be available in situations related to more commonly-taught languages, they were unavailable in this context. In the next section, the definition of need is constructed within the context of this needs analysis.

#### 6.1.2. *Defining 'need'*

While a broad view of NAs was provided above, the term *need* itself can have a variety of interpretations. In order to clarify how *need* is defined for this NA, it is important to also declare what *need* is not. In this section, I will review some of the common understandings of what is meant by *need* and synthesize them into a definition which is a better fit for the purposes of this study.

In the literature, proposed definitions of *need* often have subcategories. An early categorization system for *need* comes from Hutchinson and Waters (1987), who worked in the field of English for Specific Purposes. They proposed that *necessities* are objective needs and are required for a learner to successfully use a target language. *Lacks*, on the other hand, are the differences between target L2 proficiency and what learners currently know—a concept similar to the term *discrepancy* used by (Stufflebeam, MacCormick, Brinkerhoff, & Nelson, 1985)—while *wants* are subjective needs, or needs the learner is consciously aware of (similar to the

term *language needs* as used by Brown (2001:13)) and are, as such, prioritized. Because this needs analysis does not have access to learner proficiency or assessment data, any *lacks* are based on reports made by the learners themselves or their instructors. Thus, there is little point distinguishing *wants* from *lacks* for this project. This is just one example of how categorization systems developed for more commonly taught languages do not fit the requirements of a project focusing on a resource-impooverished, endangered language.

As time has progressed, researchers have proposed more complicated categorizations and some of the newer definitions of *need* have little in common with previous literature. For example, Brecht & Rivers (2005:82) approach the issue from the context of a hypothetical language market, which accounts for linguistic capital along the same lines as general resources in an economic system. In this context, they provide three additional terms on the same level with *need*, namely *demand*, *supply* and *capacity*. *Demand*, “refers to the specific tasks or interactions for which language competence is necessary or desirable.” Of the four definitions they suggest, *demand* is the closest to more established definitions of *need* (e.g., Brown, 2001). In fact, Brecht & Rivers provide a more abstract definition for *need*, as it “represents the perceived or latent harmful conditions or beneficial social marginal value that can be mitigated or improved by language competence.” Essentially, *need*, here, is the motivation for language learning projects. For Indigenous language learning contexts, Brecht & Rivers definition for *need* could include improved student self-esteem, identity and political sovereignty, an idea that will be explored further in subsection 6.2.4. *Supply* “refers to the available language competencies (human and technical), their sources, and modes of their storage” while *capacity* is “the ability of the nation (or other polity) to produce the supply of linguistic competence designed to meet demand.” All of these four concepts are partially of interest to most NAs related to Indigenous

languages, but for this specific NA, *need* is the least applicable. Instead, this needs analysis primarily focused in *demand* with *supply* based upon a presumed limited *capacity* being the next priority and *need* playing only a minor role.

Vandermeeren (2005) provides another example of how complex, yet similar and arbitrary, some distinctions in terminology related to *need* can be. For Vandermeeren, *need* is initially defined (in the singular) as something based on objective criteria. The criteria do not necessarily have to be wholly objective—just more objective than pure opinion—while *needs* (in the plural) are solely based on opinion. Additionally, Vandermeeren divides *need* into three more explicit categories (regardless of plurality): *unconscious need*, *objective unmet need* and *subjective need*. The subcategorization defining *subjective need* as distinct from *needs*, which is based on opinion, provides little utility for this project but, again, shows the value of clarifying how the term *need* is and is not used in a needs analysis.

Briefly moving away from applied linguistics towards a more general social science perspective, Reviere, Berkowitz, Carter, & Ferguson (1996:5) use the following definition: “Need is defined as a gap-between the real and ideal conditions—that is both acknowledged by community values and potentially amenable to change.” The key idea in this definition is that *need* stems from community values and is flexible. For Indigenous language communities, there may not be many shared values and ideas with respect to language education, as it is often a controversial topic. Therefore it is important to recognize that because the entire community cannot, and sometimes will not, make themselves heard, a compromise must be made such that stakeholders become the primary representatives of “community values,” though there may be circumstances when the stakeholders’ views are contrary to those of the larger community.

Because of this, *need* for Indigenous language communities must not be limited to something “potentially amenable to change” but must be seen as inherently temporary and requiring frequent reassessment.

While there are concepts and ideas in all of these definitions and categorizations that are of interest to this project, for the sake of efficiency, the term *need(s)* will be used as an encapsulating definition, primarily following Reviere et al (1996), Brown (2001) and the definition for *demand* provided by Brecht & Rivers (2005). Therefore, for the purposes of this chapter, *need(s)* is/are defined as *the subjective language goals and concerns of the community and its stakeholders*. The goal of this *needs analysis* was, therefore, to learn what the community wanted. It was a community-directed analysis in which the objective *need* (Vandermeeren, 2005) did not require inclusion in the proposed definition but the objective *need* was simply whatever must be done in order to account for the subjective *needs* that, while of interest to the dissertation project, as a whole, largely falls outside of the purview of this specific needs analysis (§6.2.6). In addition, the objective *need* is so substantial for this community, it’s more important for the community to subjectively guide the resources towards the most deserving objective needs. A side effect of the great objective *need* is a lack of human and other crucial resources for implementation (§2.2.2.3), so it is vital that solutions attempting to address objective needs are motivated by community and stakeholder opinions, since they are the people in the position to implement any solutions. Solutions and resources that engage the subjective *needs* of the community, again as defined for this needs analysis as interests or *wants*, are much more likely to be utilized.

### 6.1.3. *Analysis framework and philosophy*

Now that an interpretation of *need(s)* and a *needs analysis* has been made, the next step is to describe the philosophical framework that directed the needs analysis. Stufflebeam et al. (1985) provide four frameworks for guiding projects and analyses related to language learning that are relevant to the sample online course module (Ch. 7). The first, *discrepancy philosophy*, claims *needs* are any differences between future desired student language performances and what they can currently do. *Democratic philosophy*, on the other hand, claims *needs* are any learning goals that are preferred by a majority of the stakeholders involved while *analytic philosophy* claims *needs* are whatever the students would naturally learn next based on what is known about them and the learning processes involved. Finally, *diagnostic philosophy* claims *needs* are any language elements or skills that would be harmful if missing. The needs analysis for this project specifically emphasized a *democratic philosophy*, but the actual resource development plans incorporated the needs analysis results with *discrepancy* and *analytic philosophies* into the sample course design and *diagnostic philosophy* as a guide for the final content and as a structure check for the course.

In order of priority, three models taken from West (1994) and Jordan (1997) were found particularly appropriate for this needs analysis. A *learning-oriented analysis*, which takes the view that *needs* (e.g., syllabi, content, etc.) should be negotiated between students and other stakeholders, was utilized in the sense that student views were balanced in comparison with stakeholder views during the data analysis. A *means-analysis*, which focuses on the learning situation with as few preconceptions as possible in terms of practicality, logistics, cultural appropriateness, etc., was integrated as well because little was assumed to be known about the learning contexts in the community. Therefore, the flexibility and utility of the solutions were a

primary interest. Finally, a *set menu analysis*, which sets out to create a menu of “main courses” from which the sponsors or learner can select was used during the initial interview phase in order to prompt discussion and illustrate potentials for the participants. Again, because the situation in the Yakama language community differs substantially from the majority of needs analysis contexts described in the literature there are limits to how well previous models can apply. Regardless, each of these models offer some beneficial aspects that could be incorporated into the project but would not be particularly useful if implemented in isolation.

As argued in the previous three subsections, it was important to clarify what this project meant by the terms *needs analysis* and *needs* as well as to provide a more explicit philosophical framing. The issue of the complexity and limited fit of existing models for NA’s will return when the assessment schedule and specific designs are discussed in section 6.4. In the next subsection, I will briefly describe some of the special concerns that must be taken into account when conducting a needs analysis in a politically, economically and socially marginalized community.

#### 6.1.4. *Effects of attitudes, politics and activism on needs analyses*

“... *whoever determines needs largely determines which needs are determined.*”

(Chambers, 1980: 27)

The quote from Fred Chambers reprinted above illustrates the idea that bias, to some degree, is a part of any needs analysis. Another way of interpreting the quote is that the person who designs and analyzes the needs analysis may have a bigger influence on the outcomes than the voices of the participants and stakeholders, who in an ideal situation would be the ones who were determining the needs.

Jacob (2013) takes this idea further and argues politics, activism and attitudes cannot be divorced from work and studies being undertaken related to an Indigenous community, such as this needs analysis and its associated projects. Following this perspective, Auerback (1995) argues that NAs are inherently political, but this factor is accentuated in Indigenous communities.<sup>109</sup>

While it is still debatable whether attitudinal or political issues can be rightfully defined as objective needs (as opposed to wants), issues such as sovereignty and cultural pride do play a role in language education, particularly for North American Indigenous communities. Jackson (1993) proposed a set of terms to capture these needs, which are often on the periphery of the linguistic and sociocultural context, and named them “non-language outcomes.” These include *social, psychological support, confidence, cultural understanding and learning about learning* outcomes. As briefly discussed earlier (§6.2.2), these needs can have a strong influence on an Indigenous learning community, and it is necessary to recognize and account for them, but they are not the main focus of this needs analysis. It is important to remember that sociocultural or political values may be external to individual learners present in any given situation, and as such, Brecht and Rivers (2005: 80) define the term *social marginal value* as a “more rigorous and positive statement of societal need for language, rather than the sum of private marginal value.” Crookes (2009) builds on this by providing the following description of a “radical”<sup>110</sup> language

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<sup>109</sup> One example of this is that the people conducting the needs analysis are often associated with an organization outside of the Indigenous nation in question, as is the case of this needs analysis. Because of this, it is important that political oversight play a role to some degree, which in the most limited sense would be simply keeping local authorities informed of the project before and during the process. Even if a citizen of an Indigenous nation is conducting the NA, as this dissertation has discussed frequently, language and education are often controversial topics within many communities and related investigations require diligence.

<sup>110</sup> Here “radical” is used to describe teaching that recognizes its political relevance and potential for amplifying or restricting student engagement and understanding of issues affecting the students. For Indigenous citizens, issues of sovereignty, cultural pride and cultural assimilation can all play a role in language classrooms. While related topics

instruction—a description that may apply to the perspectives of some people present in the endangered/Indigenous language community:

*“Radical approaches in language teaching are clearly different from other language teaching approaches at some level, since they hold a particular perspective on society, espouse and advocate particular values and conceptions of society and of the individual, and above all have an activist perspective—that is, set themselves against the status quo and assume that students have a degree of agency in and on society which it is the role of curriculum and pedagogical practice to reflect and support.” (604)*

Therefore, as opposed to more instructor-focused NAs that might be appropriate for more-commonly taught and less-radical learning environments, this needs analysis is greatly interested in the needs and perspectives of the students.

Johnstone (2000) provides another good argument for why caution and care are needed in a needs analysis like the one undertaken for this project, in which local politics are inevitably linked.

*“...descriptions of less-powerful groups can easily be read as critiques, and deciding that someone else needs help can easily be seen as condescending, as a way of asserting power and control... And well-intentioned linguistic research sometimes disrupts and disturbs the people it is about.” (Johnstone, 2000:54)*

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may be broached in classrooms for more commonly-taught languages, the situation facing most Indigenous students, who are often marginalized, makes these issues more sensitive and potent.

While the term ‘less-powerful’ may be slightly problematic in many situations, for this project I did not have nearly as much at stake as the participants and I greatly appreciate their willingness to support the needs analysis and related projects.

An awareness of these issues and arguments can help a conductor of a needs analysis who is not an in-group member of the community avoid a rushed judgment. It is important to expect some degree of controversy to appear where it might normally not in the context of more-commonly taught and dominant language communities. One should also recognize the political import of the language and its relationship to culture (§8.2.1) and keep in mind there is much that is not knowable to an outsider. It is this latter point that brings us to the topic of stakeholders and why authority must be delegated, which is the focus of the next subsection (§6.2.5).

#### 6.1.5. *Stakeholders and data*

Connelly and Clandinin (1988:124) define a *stakeholder* as “a person or group of persons with a right to comment on, and have input into the curriculum process offered in school.” The influence each stakeholder should have on a needs analysis can be determined by necessary accountability, which involves determining how much right a stakeholder has to guide the project by examining the extent to which a decision would affect the stakeholder or cause that stakeholder risk if the decision was ignored. The authority of a stakeholder is largely determined by the participants in the needs analysis itself, so the stakeholders the community determines to be authoritative (e.g., Dr. Beavert in the needs analysis described in this chapter) should be given more weight. The target population (Richards, 2001) of the needs analysis discussed here includes Sahaptin language educators, students, policy makers, administrators, researchers as well as community members and leaders. Richards classifies the information given by these

stakeholders as *views* (e.g., *student views*, *public views*, *academic views*, etc.). In the case of this particular NA, in addition to students, non-students were targeted, and their views have been included, though it is important to note a needs analysis should be learner-oriented overall (Purpura & King, 2003; Reviere et al., 1996).

#### 6.1.6. *The role of the interviewer and the stakeholder*

The next question to address is how each stakeholder is best-suited to speak for and assess the community itself and in what areas should the interviewer be more involved. Individuals are socially conditioned to a certain standard or level of expectations, in this case, expectations for education and language vitality. “If standards of need are assumed to be relative, for the sake of comparison, there must be a base group to serve as a standard against which to evaluate levels of need. In needs assessment, the comparison group is most appropriately the relevant community of which the target population is a part” (Reviere et al, 1996:4)—a difficult notion when considering the Yakama English-speaking community. Currently, there are L2 education opportunities for more-commonly taught languages available within the community,<sup>111</sup> but actual exposure and applied linguistic understanding are predictably low.<sup>112</sup>

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<sup>111</sup> The only well-supported world language option in the immediate community is Spanish, but Central Washington University, which is located around thirty-six miles from the city of Yakima, offers at least six other languages. Also worth noting is an awareness of a large Spanish-speaking migrant population in the local community (§4), which some of the participants in this needs analysis commented on.

<sup>112</sup> Exposure to other non-language classes (e.g., math, science) which generally have greater access to resources and trained teachers can affect a perceived standard. Also, it is possible exposure to other Indigenous language programs may affect this perception. For example, many of the stakeholders in this needs analysis mentioned the examples of Hawaiian and Maori revitalization efforts in comparison to Yakama.

Long (2005) uses the following analogy: Patients of a doctor don't make the diagnosis, the doctor does, though the doctor still uses information gleaned from the patient.<sup>113</sup> "All these individuals can sometimes provide useful information on such matters as their learning styles and preferences, i.e., partial input for a *means analysis*. Understandably, however, they tend to make inadequate sources of information for a *needs analysis*..." (20) Long suggests researchers ask: *What is the learner's understanding of language/linguistics? What is the target area where the language will be used?* Long also suggests NAs focus more on *tasks* and less on *texts* or *abstract language needs* as more stakeholders will be better at contextualizing their needs for the former than the latter. This idea fits well into the definition of *need(s)* presented in subsection 6.2.2.

It is clear that NAs related to similar Indigenous language communities require particular attention to the politics and power involved. While I do not claim to be an authority on the many perspectives about language held by citizens of the Yakama Nation, it is crucial to be on the lookout for and take into account political and cultural issues as well as the language attitudes many NAs for non-Indigenous communities may be less concerned with. As an outsider to the language community and a non-Yakama citizen, utilizing the role of the stakeholders as a source of primary authority was crucial. Because having universal participation from all Yakama

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<sup>113</sup> The power imbalance in Long's example seems appropriate for this situation as the person conducting the needs analysis controls, to a very large degree (e.g., Chambers, 1980), the outcome of the needs analysis. In addition, additional perceptions of power may exist since the person conducting the needs analysis is also working at a large academic institution and referring to linguistics concepts, jargon, and models that non-academics may be unfamiliar with. The Yakama Nation has no traditional power over me, the researcher, as I am needs analysis. While as a researcher I have no actual power, I do have a responsibility to address the issues described in this sub-section. It is important to respect the sovereignty of the Yakama Nation and its citizens as they have kindly given their time to support this project, and it is important that the needs analysis be as accurate as possible, and their voices are required for that.

citizens in the needs analysis was not feasible, compromises needed to be made. Thankfully, for this NA, Dr. Beavert was universally recognized as the main authoritative stakeholder by the other participants and stakeholders. It was similarly important for my training in linguistics and language education to play a role in finding the most effective ways for implementing solutions to the *needs* uncovered by the NA, though the training I have was not meant to prevent stakeholders and participants from voicing their *needs*.

#### 6.1.7. *Situation analysis*

In order to properly interpret the results of a NA, it is important to contextualize the findings and improve the effectiveness of the proposed project. One way of doing this is to conduct a situation analysis (SA) (Richards, 2001), which looks at factors that may be affecting the needs, the perception of the needs and the implementation of the project. Because of this, a SA can be thought of as a necessary companion to a needs analysis. Richards provides key subfactors relevant to SAs for language work, which include *Societal, Project, Institutional, Teacher, Learner* and *Adoption* factors.

Some factors may not be as objectively salient as others but may still have a strong influence on the environment surrounding the project and on the needs analysis itself. An example specific to the context of the project discussed here in this dissertation is presented by Jacob (2013). She writes about efforts to decolonize the Yakama Nation and argues for the concept of a “soul wound” or lasting negative effect caused by the trauma of colonization. Tangible examples of a soul wound, Jacobs states, include lower student achievement rates and reduced economic power and are connected to imbalances in linguistic power between the dominant and minority communities as well as to a reduction in cultural sovereignty and self-

determination. This notion is particularly useful for highlighting the importance of the linguistic and cultural needs of a community with respect to the overall health of the people living there during and after the process of decolonization.

In light of this, it becomes clear a situational analysis may not only help to contextualize the findings of a needs analysis but may also uncover situational needs or needs that may not directly be related to the language but are still important to the community and the effectiveness of the project as a whole. Also, such needs include and are affected by physical, political and financial factors (Brown, 2001).

#### 6.1.8. *Triangulation*

In addition to present data collected through interviews and surveys of the subjective human *views*, it is recommended that other sources of data be sought in order to support triangulation (Chaudron, Doughty, & Kim, 2005; Gilabert, 2005; Long, 2005). Triangulation is the process of collecting information from multiple sources with the goal of finding novel data to confirm or support the findings in the needs analysis and other secondary sources. For this project, these alternative sources of data included anecdotal information from Heritage University concerning student performance, class enrollment and curricula outlines as well as logs and journals from students, which are also ideal data sources of qualitative data often associated with a specific time (Long, 2005: 44).<sup>114</sup> In addition, details from other language

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<sup>114</sup> As will be mentioned later on, mini journals or comments may be integrated into an online course to collect context-specific data as learners explore and progress. Of course, this data won't be available to the pre-design (§4.4.1) or co-current assessment (§4.4.2), but is appropriate for post-design assessments (§4.4.3) and future NAs that are not directly related to this one.

programs and a comparison of work happening at the University of Oregon, and its Northwest Indian Language Institute (NILI), were also considered relevant and informed the SA.

#### 6.1.9. *Summary*

Needs analyses are complicated, imprecise, and can be politically volatile. Yet, they are also invaluable tools for projects that are intended to assist a marginalized language community. Because of the power imbalance, the stakeholders and community members provide perspectives and guidance that are invaluable. They have an expert understanding of the needs, strengths and existing activism of the community. An outsider intending to implement a solution to a problem they perceive in isolation will, at best, be less effective and, at worst, be detrimental to the community. The researcher's role in the collection and interpretation of the data must be recognized and carefully accounted for. Deferring as much authority to stakeholders as possible is one good method for doing so, though it is important to note that while NAs are valuable tools for such projects, individuals' subjective (and occasionally objective) perspectives should not be the sole source of data. Situation analyses and triangulation are necessary to both improve the accuracy of the results and, if done correctly, reduce the subjective influence of the researcher.

## 6.2. RESEARCH QUESTIONS

Below are the three main research questions for this NA, together with their sub-questions. The inspiration for these questions primarily came from the literature reviewed earlier (§6.2) as well as the study of K-12 education (Ch. 3) and the Lushootseed language course project (§4.4.4). Additional literature not discussed in the background but specifically tied to a particular question will be cited following that question. All of the questions below pertain to Sahaptin language education:

### **What are the needs of the community?**

- What are the situational needs of the students?
- What are the language needs of the students?
- What are the situational needs of the teachers?
- What are the language needs of the community?
- What are the situational needs of the community?
- Post-test | To what degree were the needs met? (perception/opinion)

### **What are the attitudes of the community regarding these projects?**

- What attitudes exist regarding online education?
- What attitudes exist regarding cooperation with the UW?
- Would the community prefer modules that could be integrated easily into existing classes or a standalone online course?
- Should the course take a focus on meaning or a focus on forms (i.e., a grammar and metalinguistic info centered) approach (e.g., Mickan, 2013)?

### **How does the community think security issues should be handled?**

- How much of the course and archive should be open to the public?
- Is the password security for individual materials in the archive sufficient?
- What should the community's involvement in administration and curation of the site and archive look like? (Christen, 2011; First Archivists Circle, 2006)

The purpose of the following two subsections is to present the breakdown of the categorization of the situation and needs analysis with explicit reference to the literature that motivated them. These subsections are provided for readers interested in the structure and

background of these categories with respect to the needs analysis data analysis. Because many of the terms and concepts involved with NAs can be vague or vary in interpretation (e.g., §6.2.2), it seemed advisable to provide direct references should the reader require clarification.

#### 6.2.1. *Situation analysis categorizations*

Table 2 provides a simplified breakdown of the core categories and their sub-topics for the data in the situation analysis, based on (Richards, 2001). In the rightmost column are cross-references to the sections containing the data that best addresses the corresponding category listed in that row.

Table 2 *Situation analysis categories (Richards, 2001)*

<b>Category</b>	<b>Relevant Data by Section</b>	<b>Emphasized Sub-topics</b>
<b>Education</b>	6.7.1 6.7.2 6.7.9	Redundancy with existing courses
<b>Teacher</b>	6.6 6.7.1 6.7.2 6.7.3 6.7.5 6.7.6 6.7.7 6.7.8 6.7.9 6.7.10	Proficiency Training and experience Morale Beliefs Teaching styles
<b>Economics</b>	6.7.2 6.7.4	Student access to computers and the internet Future hosting of the course
<b>Institutional</b>	6.7.2 6.7.3.4 6.7.4	Competition with existing courses The relationship between the Yakama Nation, Heritage University, NILI and the UW
<b>Politics</b>	6.7.3 6.7.4	Issues with development and hosting at a particular institution Issues with making content available to non-Yakama citizens
<b>Adoption, implementation, or use of the course and archive</b>	6.7.1 6.7.2 6.7.3.5 6.7.4 6.7.5 6.7.7 6.7.10	Compatibility Practicality “Have the features and benefits of the innovation been clearly communicated to teachers and institutions?” (Richards, 2001:103)

### 6.2.2. *Needs analysis categorization*

Because this project deviates slightly from standard NAs for language education, the following categories were selected from key frameworks in order to best account for the issues at hand. In Table 3, the category is listed in the leftmost column with appropriate sources following.

Additional information and examples can be found in the center column with the key sections containing data relevant to that category found in the rightmost column.

Table 3 Needs analysis categories

<b>Category and Source</b>	<b>Relevant Data by Section</b>	<b>Additional Info</b>
<b>Public Sentiment</b> (Reviere et al., 1996:72)	6.7.1 6.7.2 6.7.3 6.7.4 6.7.10	e.g., How do community members perceive UW involvement? What attitudes exist regarding access to language resources?
<b>Problems</b> (Rossett, 1982)	6.7.1 6.7.2 6.7.3.5 6.7.5 6.7.7 6.7.8 6.7.9 6.7.10	(Q for Teachers) What kinds of problems are students encountering when trying to learn Sahaptin?
<b>Priorities</b> (Rossett, 1982)	6.7.2 6.7.3.2 6.7.5 6.7.8 6.7.9 6.7.10	(Qs for Students and Teachers) Which needs (situational or language) are the most important? (ranked) A needs assessment is a “process of ordering and prioritization of community needs” (Reviere et al., 1996: 6).
<b>Abilities</b> (Rossett, 1982)	6.6	(Qs for Students) What is your proficiency in the language? (self-judged)
<b>Attitudes</b> (Rossett, 1982)	6.7.3 6.7.4 6.7.6 6.7.7 6.7.8 6.7.9 6.7.10	(Qs for Students and Teachers) General attitudes regarding the language as well as what they would like to learn more.
<b>Solutions</b> (Rossett, 1982)	6.7.3 6.7.4 6.7.5 6.7.6 6.7.7 6.7.8 6.7.9 6.7.10	(Qs for Teachers) Do you have any ideas for how to solve the problems you raised earlier?
<b>Knowledge</b> (Patton 1987)	6.7.1 6.7.2	How many teachers work in this program? What is the schedule of classes for this program?
<b>Demographic</b> (Patton 1987)	6.6	How many years have you studied Sahaptin? How old are you? Are you a student?

### 6.3. ASSESSMENT SCHEDULE AND DESIGN

NAs can be conducted before the launch of a language program or project, as well as concurrently or afterwards (Richards, 2001:54). The needs analysis for this project was conducted at all three points, and hypothetically, the post-phase could occur perpetually (e.g., §6.2.8). It is important to note that according to the literature reviewed (e.g., Long, 2005), the ideal order for conducting a similar process begins with an unstructured interview which is followed by a more structured interview. Jasso-Aguilar (1999) ranks the following methods according to effectiveness:

- Participant Observation (Most useful)
- Unstructured Interviews (Better than questionnaires)
- Written Questionnaires (Not as effective)

Participant observation was not an option for this project because of limited access to students. Again, this needs analysis drew from a variety of resources as no single explicit model was ideal for the Yakama language situation, so the needs analysis combined the ordering in Long (2005) and the effectiveness rankings of Jasso-Aguilar (1999) as well as additional literature that is cited in the following sections. The resulting sequence was: *1) unstructured interviews, 2) structured interviews, 3) written questionnaires, 4) structured interviews.*

When considering post-design assessment, one must ask: *When is the right time to do the evaluation?* Chen (2005) suggests this should be determined by checking with stakeholders, though other possible times to conduct the assessment could include:

- once x many students have completed y much of the course; or
- once x many individuals have utilized y many resources in the archive; or

- x weeks after the course or archive has been launched

Because of the limited population in the Yakama language community and difficulty recruiting student participants (§6.6), this needs analysis utilized time and general uses of projects as a metric for the post-design assessment: two weeks after the launch of the archive/course and after each key stakeholder had explored both projects to the extent they felt comfortable assessing them, the post-design assessment was begun.

### 6.3.1. *Pre-design assessment (Phase 1)*

The workflow for this project began with a series of unstructured interviews followed by longer structured interviews with key community stakeholders. The content from these interviews guided the design of an online questionnaire that was distributed to the wider community.

The articles cited to the right of each part of each phase were examples particularly suited for use as models in the construction of the instruments of this study. Each part of the needs analysis is listed in chronological order and is minimally described here. Additional details (e.g., about the participants (§6.6)) are described later on in this chapter. The aim of this immediate section is to provide a broad overview of the needs analysis schedule with key literature connections highlighted.

*Unstructured and semi-structured interviews (e.g., Wilson, 2014; Chaudron et al., 2005; Gilbert, 2005)* - This portion of the needs analysis was completed through a series of *meetings* as defined by Richards (2001). The format, whether unstructured and semi-structured, was largely guided by the participants. As long as the discussion was relevant to one of the research questions, no attempt was made by the interviewer to steer the conversation in any particular

direction. Not all of the prepared questions had to be addressed by each participant, and the interviews where multiple interviewees were present were generally less structured than the single-participant interviews.

*Feasibility analysis (e.g., Ross, 2009:759–761)* - Rough models, in the form of an alpha archive and a course mock up were presented during some of the unstructured interviews and during all of the structured interviews.

*Structured Interviews (e.g., Gilabert, 2005:188)* - The data from the unstructured and semi-structured interviews provided a guide for these more-structured interviews with the key stakeholders. If some factors were not addressed by certain stakeholders during the initial less-structured interview, they were contacted again for a brief follow-up interview at this point.

*Self-Administered (Online) Questionnaire*<sup>115</sup> (e.g., Brown, 2001; Gilabert, 2005; Long, 2005; Vandermeeren, 2005).<sup>116</sup> - The online questionnaire was designed and based on the outcomes of the structured interviews using the Catalyst WebQ system.

After the data for the pre-design assessment had been collected, it was necessary to analyze it in order to define clear aims and objectives. *Aims* (Richards, 2001) are explicit definitions and goals for a program, and as such, aims for users of the Sahaptin sample course module and archive discussed in this project could include the ability to: participate in ceremonial use of the language; master the orthography; introduce phrases into everyday conversations and; understand the basic syntax and phonology of the language.

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<sup>115</sup> Brown refers only to mail-in questionnaires, but the definition is also appropriate here.

<sup>116</sup> While Vandermeeren's questionnaire has some well-designed elements, the scale is from +3 to -3 and has no zero option. This study used a more standard Likert-like five point scale with a neutral selection.

*Objectives*, on the other hand, are smaller units that make up an *aim*, and as such, objectives for users of the course module and archive might include more specific ways to introduce phrases into everyday conversations, such as: basic greetings and asking and answering the question: “How are you?”

### 6.3.2. *Co-current design assessment (Phase 2): structured interviews*

This portion of the needs analysis consisted of targeted interviews conducted in person or via Skype, and some supplemental interviews were conducted by email. As work progressed on the archive and course, the results of these interviews were periodically reviewed by key stakeholders.<sup>117</sup>

### 6.3.3. *Post-design assessment (Phase 3)*

#### 6.3.3.1. *Unstructured interviews (second round)*

During the pre-design assessment interviews, the issue of the post-design assessment was raised with key stakeholders. They were asked if any classes would be ready to integrate with the course, and if so, at what time. All evidence, however, suggested integration would not be feasible in the immediate future. At a follow up Sahaptin language conference held at Heritage University<sup>118</sup> a presentation of the finalized<sup>119</sup> archive was given demonstrating the core functionality, with a particular emphasis on collaboration and security. Ample time was provided for the attendees to ask questions or raise concerns. All of the attendees were provided a paper with information on the archive and its location and asked to contact me with any questions, concerns or ideas.

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<sup>117</sup> Any data that might identify a participant was not shared. These results were generalized comments and ideas that were abstracted from individuals, organizations or locations.

<sup>118</sup> Páwyak’ukt Ichishkíin Sapsikw’aláma (Gathering of Ichishkíin Teachers), Heritage University, August 19, 2015.

<sup>119</sup> ‘Finalized’ in regards to the system and requested functionality, but not in terms of the materials it contained.

### 6.3.3.2. *Implementation monitoring*<sup>120</sup>

Implementation monitoring (Ross, 2009) was dependent upon the amount of use the archive and course got and was the icing on the cake, so to speak, to the rest of the post-design assessment data. No direct interaction with stakeholders was involved with this aspect of the needs analysis. Instead, web logs and course reports provided usage information.

## 6.4. INTERVIEWING METHODOLOGY

The qualitative methodology used for the interviews conducted for all three phases (§6.4) closely followed the majority of the twelve aspects of qualitative research interviews provided by Kvale & Brinkman (2009: 28). Of these, the immediate and geographically-bound life world of the participants is strongly tied to all of the data (29). The study slightly extends beyond the aspect for “Qualitative,” as the methodology does have a minor quantitative focus as well. It also deviates from the aspect of “Specificity” because the subjects were asked about their beliefs regarding the prioritization of specific academic subjects in general.

While most of the participants expressed verbally no interest in remaining anonymous, some respondents were initially not very comfortable with being recorded. As the region the participants were from is sparsely populated and a somewhat extended community, certain personal identifiers (e.g., occupation, the exact location of the interviews, etc.) were omitted, pseudonyms were used and only portions of the transcript were reprinted below. The co-construction of the discourse is often highly apparent, especially when the friendly and non-

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<sup>120</sup> This was dependent on whether instructors would like to have a heavy hybridized, classroom integration component for the course. In the end, the data showed an strong interest in hybrid-compatible and standalone content (§4.7.7), which makes for more feasible, short-term implementation monitoring.

combative posture adopted for the interviews is taken into account—a fact that has implications for the data (Kvale & Brinkman, 2009: 75).

A list of questions was prepared to be used as a guide for the interview, but language and order varied depending on the flow of the conversation and the communication style of the participant.<sup>121</sup> Some participants avoided certain questions for a variety of reasons (e.g., a lack of interest, controversy, etc.), although they did not always clarify what the reasons were. Therefore, not all of the participants provided recorded spoken data for each of the questions. These questions were well received by the participants and, generally, there was no need to clarify. Most of the Yakama citizens guided the conversation and touched upon nearly all of the questions with little intervention.

## 6.5. PARTICIPANTS AND SETTINGS

### 6.5.1. *Interview participants and stakeholders*

The stakeholders involved in the interviews were primarily self-identified as Indigenous, but not all were Yakama citizens. Every person was involved in revitalization activism or education to some degree. The perspectives of these stakeholders were the cornerstone of the needs analysis.

Harry, Ronette, Josie, Andy, Laura<sup>122</sup> were interviewed at a conference related to Sahaptin language and culture and were involved with language education and research to varying degrees. Harry and Ronette are Yakama citizens and involved in language revitalization. Andy and Josie are members of neighboring Indigenous Nations and work on language issues.

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<sup>121</sup> See Appendix C at the end of this dissertation for the list of questions.

<sup>122</sup> All names used to attribute quotes in the following data are pseudonyms, except for Dr. Virginia Beavert.

Three additional participants—Nadine, Diane and Donna—were self-described as not being members<sup>123</sup> of any Indigenous nation but as being active in revitalization efforts through research and other means. They made it clear multiple times that because they were not members of the Yakama Nation, their opinions were those of outsiders and they wished to respect the perspectives and defer authority to community members. As Nadine put it, *“How can I support Yakama people with their language. because I know I’m not Yakama so I can’t really be. a person who has say in certain issues.”* Nadine and Donna were interviewed using Skype while Diane was interviewed in person on multiple occasions in different locations.

Mike and Bob, both Sahaptin teachers, were interviewed at the same time in a restaurant. Shelly, another active Sahaptin teacher, was also interviewed over dinner in a restaurant. Dr. Virginia Beavert, one of the most respected elders and language activists in the Yakama language community, is the creator of most of the materials in the archive (Ch. 5), co-author of the recently published Sahaptin Dictionary (Beavert & Hargus, 2009) and involved in many other educational projects.

Because participants often referred to Virginia’s<sup>124</sup> authority and position in regards to the data set, in order to better interpret the responses given, it should be noted that during our conversation, Virginia mentioned she was trying to pass on some of her authority to the other teachers in the community. *“I made a big announcement in that gathering here about language?”*

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<sup>123</sup> The term ‘member’ of a nation is used here because it was used universally by all of the respondents. In order to keep consistency and clarity in the transcriptions this term will be used, but it is recognized as being inaccurate and problematic. Readers are encouraged to interpret the word in the sense of ‘citizen’ (Rivers, 2013).

<sup>124</sup> Within the context of the data from the NA, Dr. Beavert’s first name will be used to maintain consistency with the other participants and their data.

*...there were elders there who understood me. and I told them it was time for me to step down. I was getting pretty old and... I just said that I have other things to do.”*

It is clear, therefore, that although Dr. Beavert does not wish to take on any further responsibility or manage additional projects (e.g., those described by this dissertation), she is the most knowledgeable person in regards to the materials present within the archive and is, technically speaking, the creator of most of the content. As such, following the methodology outlined in section 4.2.4, it is important to respect her decision to prioritize certain projects as she is the authority figure for these language projects and the majority of the respondents specifically recognized her words carried additional weight. She and I discussed some of the people she feels are the next generation to take up the charge on language revitalization issues within the community, and though the identities of these people will not be disclosed, I needed to respect her intentions and give additional weight to the stakeholders she identified as participants in the needs analysis.

The interviews took place in a variety of settings according to the convenience of the participants. Participants were informed the interview would take a minimum of twenty minutes, but the interview could be stopped at any time. The participants were very generous with their time, and the average length of each interview was 1 hour and 15 minutes.

#### 6.5.2. *Questionnaire methodology*

I developed the questionnaire by following the literature described above and by taking into account the responses the stakeholders made during the first round of interviews (§6.4.1).

After those first interviews were completed, I transcribed and conducted an initial analysis of each.<sup>125</sup>

The questionnaire was constructed using Catalyst WebQ and distributed over the internet. No personal identifiers were intentionally collected and any that were provided were omitted from the published data. There were a total of 35 questions, but the amount each participant received was less than that, as skip logic was employed to direct certain participants (e.g., teachers vs. students) to the questions that specifically targeted them. The survey was available for people to take for a period of more than two months.<sup>126</sup>

### 6.5.3. *Questionnaire participants*

A total of 36 participants completed the questionnaire. Three self-identified themselves as teachers of Sahaptin (or teachers interested in Sahaptin education), 26 as Sahaptin students, one as a researcher and the remainder as “other”. Because the questionnaires were created with the goal of gathering as many perspectives as possible, the subject pool included minors (ages 13-18). Additional consent and informational paperwork was created for instructors to forward to parents and guardians prior to the students completing the survey. 23 respondents reported they were between 13-18 years of age.

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<sup>125</sup> As with all of the interviews, the questionnaire and associated materials were reviewed by the UW IRB.

<sup>126</sup> Recruitment materials for the questionnaire were distributed to all of the stakeholders, interview participants, recent language conference attendees, and people associated with NILI and were also sent to available contacts at the Yakama Tribal Council (including voice messages when appropriate), various language programs (including Warm Springs and Wapato), local media outlets (e.g., radio stations and newspapers), local museums, and other contacts recommended to me. The key recruitment language for the study was, “Yakama Community Opinions Wanted. Are you interested in the Yakama Language or Education? Your opinions are sought for a University of Washington research study for a dissertation project on the creation of an online Yakama language course and learning material archive.” The recruitment text can be found in the Appendices for the needs analysis.

Table 4 provides a breakdown of responses regarding nationality, citizen/membership and area of residence. Of the participants who selected “Yes, Other”, three were from the Confederated Tribes of Warm Springs and one was from Grande Ronde.

*Table 4 Responses to the question: “Are you a member of a Nation that speaks a dialect of Sahaptin?”*

Yes, Yakama	23	63.89%
Yes, Other	4	11.11%
No, But I live near or on a Nation that speaks a dialect.	5	13.89%
No	4	11.11%

Respondents were also asked to report their self-assessed language proficiency. The results of their responses are reported, below, in Table 5. One of the participants who had earlier described him/herself as “Other” reclassified him/herself through the additional information provided, responding with “learned as a child, but not spoken for years” with a rating of “I know a few words and sentences”.

*Table 5 Responses to the question: “How proficient are you in Sahaptin?”*

1. I don’t know any Sahaptin.	0	0.00%
2. I know a few words and sentences.	12	33.33%
3. I can read or write or understand a little but can’t speak very well.	20	55.56%
4. I can have conversations with elders.	4	11.11%
5. I am a native speaker of Sahaptin.	0	0.00%

## 6.6. RESULTS FROM THE NEEDS ANALYSIS

All of the transcripts below are reprinted in a way that is intended to balance readability with accuracy. Natural human speech has many utterances and hedges that make reading cumbersome when transcribed. Some utterances did not have substantial semantic content (e.g., ‘uh’, ‘um’, ‘like’, repetitions, re-phrasings, etc.) relevant to the point the speaker was trying to make and were omitted from the transcript. These omissions, as well as omissions of speech

either unrelated to the current discourse or in the form of unnecessary interviewer utterances, are noted with ellipses (...). Some parenthetical notes are integrated into the transcripts to help clarify referents and to protect the privacy of the participants. Punctuation in the transcripts marks intonation. A period indicates falling tone and a question mark indicates rising tone.

Before I present and analyze the data, though, I would like to restate the ethical and methodical perspective under which this needs analysis was conducted (§6.2.4). Following the work of Jacob (2013) and similar researchers working on disadvantaged communities with threatened languages, I recognized myself as an outsider, so the *views* presented in this chapter needed to be given in as unfiltered a manner as possible. This means that unless the statements made by the interview participants can be paraphrased without a reasonable risk of misrepresenting their positions, the relevant quotes will be presented with only minor formatting and flow edits—a feasible task for the interview data, though the questionnaire data was messier and decontextualized from the larger discourse.<sup>127</sup> In addition, the questionnaire data is the only data with student *views*, and as this is a learner-oriented analysis (§6.2.5), the majority of the limited and brief comments made by these participants are provided unedited in their entirety. None of the comments made by the questionnaire respondents were edited for formatting, spelling or punctuation. This was done in order to preserve the participants' natural *netspeak* (i.e., internet slang) or writing style, which often contained semantic information that was helpful for the interpretation of the intended meaning. Each subsection below begins by presenting key data from the interviews, which is followed by the data from the questionnaire and then a brief summary.

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<sup>127</sup> In contexts where appropriate Negative Case Analysis methodology (Brown, 2001: 255; Denzin & Lincoln, 1994: 513) was used.

### 6.6.1. *Status of revitalization efforts*

Shelly, a Yakama member and language teacher, had some interesting anecdotes about the current state of education in the community.

*Shelly: “Our people are just now wanting to... allow our language to be recorded. to be written. that’s always been oral. We are trying to get it into the preschools more. I think (someone) told you about (their). immersion preschool... really that’s where it needs to begin. when the kids are really little. So for us to be trying to learn it now it’s more difficult. But as long as we have a few speakers and they’re willing to teach us. that’s good.... It’s good that they are using technology. to capture anything that they want to say... even if its memories that they’re talking (about)... We’ve got people that are just. sitting down and conversing in a language. you know without any thought. It’s kind of hard for them... Virginia will meet with one of the other. speakers. and then... just start talking... about stuff... and it’s not scripted or anything. They just say ok. just talk. and then we can look at it in the classes. and... try and translate as students... and we hear a natural speaker. so as long as we can keep our natural speakers offering... their help. that’s going to help us a lot.”*

Shelly estimated there were about 100 fluent speakers of the language within the community while Virginia provided an overview of the language vitality within the community as a whole.

*Virginia: “We have Granger. High school. where. the lower valley. has traditional people living down there. That’s why (I) go to the one house down there because they speak the language there...and then we have Toppenish. We have Harrah. doesn’t have a*

*teacher. Granger. doesn't have a teacher. We have Klickitat. down by the Columbia River. This side of the river. We had Indian students over there that. they'd like to have some materials. These are all Yakama. and then Goldendale. so. all these schools and Zillah. There's people moving into Zillah. Indian people. and a good school over there. So we need more teachers. and this (various projects) would be kind of a recruiting... way to do it. well some people are still speaking. but they don't want to get involved in this. There's too much politics. you know. They just keep quiet and stay back. but when we get together we all start talking. (laughs)"*

Donna, who was not self-described as belonging to an Indigenous nation but was involved with language revitalization efforts, had many positive things to say about work being done in relation to Sahaptin, stating she hoped to see an expansion of the domains in which the language is used.

*Donna: "...it's not moving beyond the classroom... I think there's some great classroom based efforts... and exciting things happening and things like this website... things like classes at Heritage. or U of O. People doing cool stuff on Facebook. Classes in high schools... both tribal schools and not tribal schools. That's fantastic. but... then. the question... Who's using the language every day."*

Diane, who, like Donna, is not a Yakama citizen, similarly had favorable things to say about the work being done by local teachers and discussed the website for the recently published Sahaptin Dictionary (Beavert & Hargus, 2009). The third non-Indigenous interview participant, Nadine, talked about recent efforts to reclaim domains and establish language nests, particularly in the home.

*Nadine: "I think more institutional support...and... trying to find a way to deal with the time issue. People are really busy and they don't have time to necessarily go to classes and leave their families and... I think it would be... really cool that there was a way...to... support people in their lives as is. instead of asking them to do this whole other thing that they may not have time for... and the reclaiming domains thing is kind of a way but we are still working on how to... make that easier for people."*

Nadine cited work the Lushootseed community had begun in the hopes of revitalizing Indigenous language within a kitchen setting, stating the work they'd done was very inspiring and that she and others had been developing similar materials of their own, including videos. Nadine stressed the importance of having work in the classroom support the external language nests<sup>128</sup> and domains, as doing so would provide a more all-encompassing means of language reclamation.

Each questionnaire participant was asked, "In your opinion, how important is Sahaptin language education?" Overall, participants over the age of 18 used stronger language supporting the importance of language education than those under 18 years of age. This difference could be due to the fact that the younger population enrolls in a language class for a variety of reasons, including the suggestion of parents, teachers or community members, while an over 18 age group

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<sup>128</sup> The term *language nest* originates from a Maori, and later Hawaiian, language revitalization strategy (Anonby, 1999) where L1 speakers would either provide a Maori language space or offer classes for preschool aged children who were not being raised in a Maori speaking home. The term has since been adopted by many in the Pacific Northwest and has undergone a semantic shift. The majority of the uses I've encountered, including Diane's above refer to spaces in the home or community where only the Indigenous language is used. The space is often decorated with flash cards and other visual cues. The language nest is a place where the language can first be nurtured before venturing into new domains.

will have self-elected to take the course or survey, likely signaling a stronger personal interest in the issue.

Quotes gathered from the over 18 age group regarding the importance of a language education included:

- “very important as we lose speakers every year”
- “Very important, crucial for certain aspects of culture and community wellness”
- “scale of 1 to 10 a 10”
- “It's important for language education to be available, and for youth to have the opportunity to learn their languages.”
- “vital to the survival of Yakama people”
- “Very important our way of life, spirituality, identity”

Quotes from the under 18 age group regarding the same issue included:

- “important”
- “somewhat important”
- “its okay”
- “important enough that its needs to be in more school”
- “Very important”
- “it is important to keep the language alive.”
- “not very.”
- “its important for when im collage student”
- “litle bit of important”
- “Very important, languages should not be lost.”

To summarize, the majority of the participants’ interest in content development and support is currently related to classroom external language such as support for home-based domains and the creation of language nests. These goals are also tied to everyday language use as opposed to technical abilities and deficits (e.g., advanced grammar, technical writing, poetry or specialized domain usage such as language related to fisheries or horse breeds), which will be

explored later in subsection 6.7.9. The second most common issue mentioned was the need for teachers and for greater teacher support in the form of professional training, materials and technological resources—issues which are the focus of the next subsection.

6.6.2. *Available resources and needs*

Mike, a teacher of Sahaptin and Yakama member, mentioned his school lacks fairly basic technological resources.

*Mike: “We don’t even have computers in my classroom. I have to... go to a computer lab. you know. in advance. Make... reservations and... maybe once a month. get in there... I would like to have... a set of laptops. and maybe even a cart. in my classroom that we could access. just to where we could get them typing in the language... right now. The most technology I get to use is by. I have one computer in my classroom I went and got my own set of speakers and. a little subwoofer. (to) try to get some sound out there.”*

Outside of his physical classroom, though, Mike had very positive things to say about the few available online resources for Sahaptin, in particular, the recently published dictionary.

*Mike: “...online I access. Virginia and Sharon’s dictionary. and... just this week. picked with the class... five high-frequency verbs... had them go get the dictionary. and Look them up. get the page number. and then there is usually... 1 to 3 sentences that use the verb in context. and so then it’s going to have some nouns and adjectives with it too. and. that’s... this week’s quiz. and. then they get to hear. Virginia... (a) first speaker say it because Sharon... recorded her and you can just click on the speaker icon...and. access it that way... The students seem to respond to it pretty well. and there’s some real learning going on. and hopefully in the future those sentences will stick with them and*

*they can just make little adjustments and they will plug in different verbs. And kind of know how the... word order... goes (). and just to learn from that. that's. using anything online that's about as much as I can do. and I'm just glad we have that. I know there's a lot of other. languages out there that don't even have that resource. but. that's fairly recent...Previously... we didn't have that option..."*

Mike did add that the dictionary's online interface may not be as user friendly as it could be, saying:

*"...and it makes it tough on beginning students that it's all in Ichishkūn<sup>129</sup>. but... you got to take... I can see that's. because they need to sell the dictionaries and if you want the English. it's in the dictionary. I can see that... but. It's a heck of the resource if you have the dictionary and. you know... a little bit about the language... I'm fine with it."*

Mike also raised the need for a central location for people to access materials, saying:

*"I don't want to see things all over the place too... It's kinda. what are they calling it. a clearinghouse. for everything Ichishkūn... Instead of having stuff all over the place. I don't think the Yakama Nation really has anything going right now."*

In response to this, I mentioned that while the current archive will hypothetically focus on materials from a particular collection it is possible it could be expanded to contain more current materials.<sup>130</sup> In addition, Mike and I discussed the prototype web-based materials/link list being developed by NILI and how that list could meet the need he described. This raised the question

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<sup>129</sup> As a reminder, *Ichishkūn* is the term for the Yakama (Yakima) language that is primarily used by in-group members.

<sup>130</sup> More current materials outside of the initial archive batch have been added to the archive since this interview took place.

of whether the NILI archive would be for multiple languages or simply dedicated to Sahaptin, and both Mike and Bob, another Ichishkíin instructor, expressed an interest in seeing a modern archive dedicated solely to Sahaptin content.

Bob had the following comments on the issue:

*“My whole stance on that... you know.. here in Yakama. we have to take. somewhat. baby steps... We are not ready to... jump... up on...the...national this or national this... there’s people who still... are getting after me for reading the language. or writing it or... anything like that. so we are trying. You got to work with that kind of stuff. but I think that if it was... just... (a) Yakama only type of a thing it would...be better than if it... were part of some big huge () thing.”*

Both Mike and Bob expressed concerns regarding the state of Input Method Editors (IME) (i.e., the typing interface integrated into a computer’s operating system) and fonts for the language—a discussion prompted by a question about how students would type into a Learning Manage System (LMS) (Ch. 7).<sup>131</sup> Their conversation and additional comments I made are recorded below:

*Bob: “the keyboard. the Ichishkíin keyboard that’s a short cut. that gives the barred L [l] ... or the underlined X. are they going to have. because I’m imagining you can’t use the keyboard. We have a keyboard which is just the shortcut. Instead of a semicolon it’s a barred L [l].”*

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<sup>131</sup> Issues with web-based character input for Yakama is also discussed in section 5.3.6.

*Mike: “is it language geeks... they made a(n)... Ichishkiin Yakama Sahaptin keyboard. and then. that’s what our students use... and... all the special characters are. very little used characters... on that keyboard. Is that. (what) they would. type. in... because... the. language keyboard doesn’t work... for like a handful of people.”*

*Bob: “...like that stuff you sent me and all of a sudden you get someone saying. What are all these squares... are you kidding me you’re seeing squares. great. After all of this. I thought. Everything was great. No there is a font issue. You are seeing squares... (Someone’s) always texting me in the language and (they) use (their) little shortcuts on (their) phone. Which is hang on (and) push the L. wait for a couple of seconds. A barred L pops up and you click on it. (They) send it to me and why are you sending me these B’s and K’s. B’s and um. You know these other letters that we don’t have now. in our language. It’s confusing. and (they’re) like what are you talking about I didn’t do no B. I go you need to quick drinking when you text me.”*

*Mike: (Laughs)*

*Bob: “Anyways we figured out that it’s not transferring. depending on who sees it. Everything is different. and that’s on Facebook. That’s on texts...”*

*Interviewer: “mmm. That’s really good to know. It’s most likely. It sounds like it may not be a Unicode font. because hypothetically Unicode shouldn’t have that problem. Lushootseed the font that they’re using... doesn’t have the problem. I mean everybody just types directly using the keyboard into Moodle. straight into Lushootseed and then. go. but I do know the barred I [İ] and the underlined x. Those are nasty characters...”*

I suggested the possibility of having a clickable keyboard for special characters embedded into the WYSIWYG editor (TinyMCE) or included below it in the HTML section in the LMS and received the following response:

*Bob: "...It makes it a little longer to type stuff. but then there's no mistakes..."*

*Mike: "and what is there. the T. You just go T. barred L."*

*Bob: "all of the accented vowels."*

None of the teachers and in-group stakeholders were familiar with LMSs, but many had at least heard of other language software, such as Rosetta Stone, though only one teacher (Bob) informed me of actually having used Rosetta Stone in the past.

Teachers who completed the questionnaire were asked, "What kinds of problems are students encountering when trying to learn Sahaptin?" and then given a follow-up question asking what some solutions might be for the problem(s) they raised. The first problem the teachers reported was a lack of "family participation" in the students' learning process, but no clear suggestion for a way to improve this was put forward. The second problem reported was a lack of computers in Wapato, which limited access to online materials and raised the issue of further funding being needed. Teachers also estimated that only 71.43% of the students in the area had access to a computer and the internet at home, though 89.29% of teachers did say computers with internet access were available at their school.

To summarize, the need for computers and internet access continues to be the most apparent physical resource need students in the Yakama area face. This need was expressed outside the context of the online archive and course and was one of the first topics raised in the

interviews and questionnaire. Another common theme throughout the NA's data set was the issue of promoting language use outside of the classroom within the home environment with parental participation. Remotely accessible (i.e., online) resources were seen as one method of increasing access for parents, which could improve participation, though, in general, the capacity (Brecht & Rivers, 2005:82) for parent-focused language education in and around the Yakama Nation seems low.

The most prominent existing online resource currently available is the online companion to the recently published dictionary (Beavert et al., 2009), which is a resource participants found to have had a very positive effect on language education. There were, however, minor criticisms of the limited functionality of the online system.

Comments regarding future technology needs came solely from teachers, who were strongly concerned with feasibility. They hoped to see resources that could be managed and used successfully and were skeptical of overly complicated or overly ambitious undertakings as many had failed in the past. One specific need that was expressed was an improved font and IME for the language (e.g., §5.6.6).

### 6.6.3. *Security*

Issues related to security were easily some of the most controversial and problematic that the needs analysis attempted to address. Not every respondent was interested in, or felt comfortable with commenting on each aspect of the security issue. Because this issue is particularly complex and politically sensitive, nearly all of the relevant comments and responses are presented below. In the first subsection (§6.7.3.1), the topic is the larger question of oversight and administration, namely who should be in charge of deciding who should have access to what

resources. The question “Who should be allowed access in general?” is discussed in subsection (§6.7.3.2) and is followed by a subsection (§6.7.3.3) in which participants shared opinions regarding what types of content should be restricted. Information and opinions related to the political context that would affect such proposals is presented next (§6.7.3.4), and then the question of how accessibility can be balanced with security is addressed (§6.7.3.5).

6.6.3.1. *Who should be responsible for deciding and administering access?*

Dale, a member of a local Indigenous nation who works on language revitalization issues, discussed the security of the content in this project by comparing it to an archiving project from a neighboring community, saying the determination of the accessibility of the content should first be guided by the wishes of “*the families of the people that are in the archives.*”<sup>132</sup> Dale added that there were special circumstances which could override this. For example, if content was created by someone who is recently deceased, he suggested at least one year should pass before that content be made accessible. Currently, it appears nearly all of the materials in the archive were developed by Dr. Beavert with some made by Edward James and Lena Owens. Except for the materials that may have been constructed by Lena Owens, Dale’s concern does not have a real effect on the archive and course security plans.

Many of the stakeholders initially presented possibilities for who could be responsible, including a specific committee, the Tribal Council, the Yakama Language Program, Virginia, and the hosting institution (§6.7.4). However, after further discussion about the feasibility of each organization having oversight, as well as talk of some the related access and political issues,

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<sup>132</sup> It is important to remember that the majority of the materials in the archive were created by Virginia and Edward and do not build on or have documentation noting that they were built on content created by other families.

most suggestions were retracted.<sup>133</sup> When no ideas were presented by the participants I asked for their opinion regarding forming an oversight committee. Some were skeptical, disbelieving it would be possible to find people with the time and willingness to participate while others were concerned it would only impede development and access. In the end, the only decision some stakeholders put forth with confidence was that Virginia should decide.

The comments listed below come from the questionnaire and are similarly concerned with who should be in control of providing access and restricting content (i.e., who should be the gatekeeper), though the responses are loosely organized by theme, sometimes ambiguous and open to a degree of interpretation. Two comments were considerably longer than the rest and did not fit well into the five categories, so they have been listed in their entirety below the bullet comment lists. The bold text heading for each bulleted list is the category assigned to each of the italicized comments nested below.

**Responses to the question: “Who should be responsible for deciding what should be restricted and who should have access?”**

**Hosting Institution or Instructors**

- Heritage University Archival Dept.
- The institution should decide
- the instructor, on a case by case basis
- TEACHERS
- Well i can't say I know , teachers an people who speak the language should make that situation
- the teacher

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<sup>133</sup> Transcripts related to this topic have been omitted because much of this discussion was highly political and transcripts could potentially identify participants. As the data was also vague and sometimes contradictory, it seemed more appropriate to provide a summary instead.

### **Virginia Beavert or Elder**

- Ask Virginia Beavert
- virginia beaver
- The head cofounder
- The elder well mature in the Ichishkin language, opened minded to think ,
- Virginia Beavert

### **Tribe**

- Developer in coordination with tribe
- the tribe
- who the language belongs to
- Tribal elder council
- the Tribe

### **Misc.**

- anyone
- the creator of website
- The person that made the website!
- i dont know
- not sure

### **No restrictions**

- open access
- none
- no one
- no restrictions, unlimited access

### **(Category: Misc.)**

*“There should be a board of directors or a committee. It should not be decided by only one person. and there should be openness with the selection of that committee. There*

*should be people hired to help with the structure of the archival procedures. Too much restriction is damaging to the communal use. It is very discouraging for the citizens of the tribe when one person or group of people is restarting access and unwilling to share the knowledge or wealth of information.”*

**(Category: Misc.)**

*“well make a level or advance be restricted. also make a log in. kinda set up for like assignments for people each day or like online learning of sounds and uses for reading a legend.”*

Summarizing, the question of who should be responsible for deciding upon the restriction of access is arguably one of the least resolved data points from the needs analysis. The following subsections do provide further background on the controversy and possible alternatives, but a firm plan was not been put forward by the key stakeholders, so additional caution needed to be taken when it came to issues of access and security.

#### 6.6.3.2. *Who should have access?*

Harry, a Yakama member involved in language revitalization, argued for different levels of security, stating that beyond the family, a governing body should oversee the project to prevent people from abusing the content. He did not provide specific examples of what would be classified as abuse but did express concern over keeping things local.

*Harry: “There needs to be more of a tribal committee because. I think overall the goal of the communities are not wanting to get their stuff in France... and Germany... or anything like that.”*

Josie, a member of a local Indigenous Nation working on language issues, addressed the same issue, describing another archiving project for a neighboring language program (i.e., non-Yakama) and how, *“The speakers were very specific. as to who they wanted to have access to the language. and that’s always been an issue... There first was family and then tribal members. and then beyond that nobody knows.”* Josie then countered this discourse, slightly, adding, *“but that’s only one language. All the other languages are very open.”*

Andy, also a member of a local Indigenous nation who talked with me at a Sahaptin language conference,<sup>134</sup> expressed a similar need to preserve things and suggested limiting access to a select group of stakeholders, saying:

*“What we all can do is share things to. building together to make one... for. our future... That’s the only way I can see it. as something like what you are doing. is archive it. tag it. and keep it safe. Keep the originals safe. but... make it accessible for a group like this. teachers.”*

Laura, another member of a local Indigenous nation who is active in support of language revitalization, had this to say about open access: *“Like some tribes. back east. they put everything out there. and even like around some tribes around here. like coastal tribes. They put all of their content. but then whereas you have other tribes. where...it’s very sensitive. but. we are kind in that middle part right now.”* She added she wanted kids in the community to be able to use anything they could to learn, saying, *“...but then we don’t want it just freely given out there to like anybody...”*

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<sup>134</sup> Páwyak’ukt Ichishkíin Sapsikw’áláma (Gathering of Ichishkíin Teachers), August 20, 2014, Heritage University.

Diane, who is not a member of an Indigenous nation but is a supporter of Sahaptin revitalization, had the following to say about security and access:

*“You don’t want it. a lockdown where warring factions could stop it. You want a. sort of a. formal... but. flexible credentialing. The person sends off the e-mail to whoever is supervising this at some point when you turn it over. and they. send the documentation they indeed are associated with the Yakama nation they’re associated with Heritage University. They are associated with the current level institution. and... this is how they want to use the materials... so it’s not exactly a vision of. anybody anywhere in the world. can logon and see that.”*

Shelly, on the other hand, was open to the idea of non-Yakama (the example she used was a hypothetical European learner) learning the language as long as the Tribal Council allowed it. At a more local level, she was also in favor of openness and shared this story:

*“... Couple years ago I had a [non-Yakama, non-white child] take my class... and one of the first things I do is... I have them write a statement. Why did you. choose to take. the Yakama language. and [the child] wrote back. (and) said well. I live on the Yakama reservation. so I thought I’d better learn what the people. how they talk and how they...”*

Virginia did not express a firm opinion on the topic during our conversation, but said:

*“I think that... I don’t know. It’s pretty hard to say... who should have access because it. I have a lot of young people asking me... How can we access that material so that we can start learning. you know. I told them well... they’re not finished... getting it in order yet. so... I have nothing to say about that right now.”*

In the end, Virginia made it clear she did not wish to be a gatekeeper for the content but would like to meet with a Tribal Council member to discuss things further.

On the questionnaire, participants were asked about their opinions regarding non-Yakama people accessing the course and archive. The summary of the results are shown in Table 6. After the participants answered the questions, they had the option of explaining their answers, and the explanatory comments are listed below the table itself. The additional comments option was particularly helpful in this case as the option showed a few people may not have selected the response they actually wanted. For example, the statements made by two of the participants who selected “No” in regards to open language access still seemed to clearly support offering the language to outsiders. Of the comments from participants who selected “It depends,” one said since they weren’t a member of a Sahaptin-speaking group, they wished to abstain from responding while two provided comments that seemingly aligned with “No” more than with “It depends”. Another two felt there should be some oversight while one person’s opinion clearly leaned more towards “Yes”. However, all of the data in the table reflects the raw responses to that particular question and remain unaltered to match any varying interpretations based on the long-form responses.

*Table 6 Responses to the question: "Should the course be available to people who are not members of a Sahaptin speaking nation (e.g., non-Yakama)?"*

Yes	24	66.67%
No	6	16.67%
It depends (I'll explain below)	6	16.67%

**Additional comments for those that selected “Yes”:**

*“I said ‘yes’ it should be available to people outside Yakima Nation. If I selected ‘no’ it was an accident. Some people might be enrolled elsewhere but have family in Yakima or be otherwise connected. I understand some people from Yakima Nation or other Indians might not want to share with ‘outsiders’ but I am not among those who share that opinion. Languages have always been free flowing and open. The more learners and teachers, speakers we have the better.”*

*“Restrictions from the sale and profit from the language”*

*“I believe that Virginia's wishes about openness should be followed.”*

**Additional comments for those that selected “No”:**

*“don't think non-members should have chance but with now times cant stop them learning it. and it would be hard to stop them so don't think there is a way to stop them”*

*“I believe that our cultural should stay in with our tribe!”*

*“anyone should have a chance to learn the language.”*

*“No, because it should be opened to anyone non-native because its a free country.”*

**Additional comments for those that selected “It depends”:**

*“Only original Sahaptin speaking tribal people: including, Yakama, Warm Springs, and others along the Columbia River who spoke/speak the language.”*

*“I don't think it 'should' be secure, but something should be in place to safe guard the materials from internet piracy. If that means having to have some gate keeper individual or group then I guess that's how it goes.”*

*“The higher learning institutions that are involved have Native American Language departments and I believe they would be best prepared to oversee implementation of any online course and ensure accessibility to appropriate language learners. As a member of the Yakama Nation I believe it would be good to work with all Tribal Governments also.”*

*“It depends on what Yakama-speaking people want; I don't feel qualified to answer.”*

*“its only a native thing”*

*“We have had non Ichishkin speaking shuyapus<sup>135</sup> that work with the language and speak it, We don't know what the future will be. We do not have many strong learners, so if none ichishkin speakers, linguists learn they may be a help to our people that might wake up from not been so interested, might mature and they may have these non indian Ichishkin speakers help them revive the loosing Ichishkin Snwit.”*

In general, participants and stakeholders were open to providing limited access to non-Yakama citizens for educational purposes, though the topic was and remains very controversial. There were concerns of theft and the commodification of the language, but few specific examples or compromises were provided. One possible example is listed in the following subsection on what types of content should be protected.

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<sup>135</sup> Shuyápu-s

white person-PL

*Shuyápu* is a word Sahaptin English speakers borrowed from Sahaptin and is made plural with the English plural suffix *-s*. (p.c. Prof. Sharon Hargus)

### 6.6.3.3. *What should be protected?*

Most of these comments reflect a general concept of content that is abstract from the materials in the archive. Although all of the participants were aware of the materials to varying degrees, it was not always clear whether their comments were influenced by an awareness of specific pieces in the archive, or were purely general.

Andy and I discussed what kinds of content needed protecting. In regards to material that might be viewed as sensitive, Andy said, *“It’s already been released. like. what was it. 20 years ago. 30 years ago? A book was written by a Jimmy Selam... and a lot of people were kind of upset with what he put in it. It was supposed to be confidential.”* The book he mentioned, Hunn & Selam 1990,<sup>136</sup> was published by the University of Washington Press, and because I am similarly associated with the UW, Andy may have had additional concerns about the projects we were discussing. Later on, he returned to the topic of the book, saying:

*“What he had in that book. was concerning... our foods. and a lot of people... one of the Elders they really disagreed with it. They didn’t like... what he had done. and it was already too late... He got paid for it... and... there’s nothing we could say. because he was already an elder and you can’t question the elders.”*

When asked whether it would be okay to make other kinds of materials that didn’t contain as potentially sensitive cultural information available, Andy said *“but that’s kind of hard to distinguish.”* I asked if it would be okay to provide access to people beyond teachers,

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<sup>136</sup> Thank you to Prof. Sharon Hargus for this information, as Andy only mentioned Selam’s name and the university affiliated with the publisher.

assuming those given access underwent some sort of screening process. Our conversation is recorded below:

(Interviewer): *“...but if there was a committee. at any point would it be? Where do you think it’s safer just to lock it all down. to password protect the entire archive.”*

(Andy): *“See it’s kind of hard to stay away from. sacred things. because everything’s... everything’s valid. not just certain things. everything... so. it’s hard to say. what’s good to say and... what’s not to be put out there.”*

When asked whether basic language content like greetings, numbers or colors should be secured, Andy argued that all language could be thought of as sacred and needing protection. However, Andy immediately reconsidered his position on absolute security, saying:

*“After I thought about it. it is really hard to... out things aside and not bring it out. and. to where all these different villages can learn. so. that’s.... after I thought about it you know... it’s kinda right and it’s kind of wrong. but... long as it happens... it’ll happen. and maybe that’s the best way for. our future to learn is to give access to the... you know. like Virginia was telling me as old as I am she’s telling me to go back to school... I didn’t know how to answer you... I think that if you put it in some kind of... teaching. tool. I think. if someone wants to learn something. They want access to that. something like this but...”*

After more deliberation, Andy stated there was a need to balance security and accessibility, but he was unsure of what that balance would look like. Laura summed up the issue by asking,

*“How are we going to move forward with technology but still... preserve...(the) sacredness of it all.”*

Donna, as a non-member of the Yakama community, did not feel justified in expressing an opinion on the topic but took the time to comment on Dr. Beavert’s work, saying, *“Virginia has been. such a fantastic proponent of openness. in the work she does. in terms of. teaching tribal members when the tribe was saying don’t do it in terms of teaching folks who are tribal members... The dictionary that is freely available. Her dissertation which will be freely available.”* Later Donna said Dr. Beavert should have the ultimate say for the materials she developed—a statement also supported by Diane and Shelly, the latter of which believed Dr. Beavert should have the primary vote but stated there should also be oversight from the Tribal Council.

Josie provided the following example of one type of content that should be secured:

*“Is there a way to limit access to certain things. and you know. I’m. not only us. but the cultural resources... We don’t want people knowing what our usual and the custom places are.”*

Andy, meanwhile, had this to say concerning the issue of local control of the content:

*“Anybody can access. and. anybody can... take it or do with it whatever they want. and that’s what has tribal council upset now... How can we teach. our own people without it going worldwide. having somebody else access it and use it in a different country.”*

Both Mike and Bob had more to say in regards to security than any of the other stakeholders. When asked how and to what degree access should be restricted for the archive, Mike stated, *“I’m an open access guy.”* Bob followed with:

*“I’m all for all open. I don’t like things being locked up. and. who has the key. and oh. I have the key so I’m going to choose who gets this. so.”* Mike continued *“Right. and. this isn’t the Yakama Nation’s. This isn’t... Tribal councils. This is from Virginia. and look how much time she has put into this and effort. and then... even working with Sharon. and... the people at the University of Oregon. It’s all to make sure that. this. continues to be learned. and locking it up just does the opposite of that. So all I’m just like () here. (I’m just saying) you know I don’t want to see it that way. The people that do want to lock it up. They are not wanting to learn it... That’s why our language... is like it is. It’s...endangered. It’s on its way to extinction. and because people are locking it up. and... you can’t learn it or speak it or practice it if it’s not there. so. I say Virginia should. have the final say. the only say even. and if she says. ‘open it up’. It should be open. Who else. That’s her language... those are her words. That comes out of her head. and out of her mouth. from her hand. and if she wants it to be out there for everybody so non-Yakama do-gooder linguists can help do what you’re doing, and what Sharon’s doing. and people at the University of Oregon. so be it. We’ve benefited from that. and I want to see it be like that.”*

Bob continued the conversation by saying:

*“Around here... it’s a tricky subject but only up to a point. just because. I was at (a language related conference) ...and... I don’t even remember what they were talking*

*about. but. (a person) was like. This needs to be. protected. It needs to be offered to Yakama tribal members only. We need to be monitoring the. Blah blah blah... It's like. Do you guys agree. and then. people were kind of looking at her and they just shook their head. She's like. ok. and then she laughed. and I was thinking about it. and...that's going ...overboard. and I said. You guys... really AGREE. I said. Are we saying Yakama tribal members only. and (we) oh. You have to show me your... enrollment card... if you want a look at the language stuff. I said that doesn't make any sense... how many of us have somebody in their family that's considered. that we consider. Yakama but they're not enrolled. Are we saying oh I'm sorry... This is for my kids over here. They are enrolled. Your kids' aren't. Can you please... go into the other room. and then everyone's like no. We don't agree with her. but nobody wanted to say anything because she was loud... so I don't think the majority of the people feel that way either. I think it's just a handful of. (people) ...and (they) are not afraid to jump up and say it. whenever they need to. and so... That was when I made the decision. From then on. I'm... going to be like... no no no. I disagree.”*

I followed up by asking about security for the online course module, and Mike immediately responded with:

*“...it should be open. (laughs) why are we afraid about. someone. Oh God! We are! Make sure that. Someone's going to learn Ichishkíin. Come on! We need all the help we can get. We don't have... a linguist. on staff. We have a language program. No linguists. and I don't... care if its Yakama or non-Yakama. We need somebody. When we started our. fisheries and wildlife programs. our first... wildlife biologists and fisheries*

*biologists. they weren't Yakama. and we need help. and if we need qualified people to help... (the) more people that... learn Ichishkín the better. What. Doesn't a language. give you... (a) better understanding of the people? () What our priorities are. How we view the world.... Why would we want to... try to... internalize that. Doesn't make any sense to me... and then we teach... language at... Wapato. Or... Heritage. Those classes are open to anybody. and. you can teach it to anybody."*

Shelly, meanwhile, argued for some degree of openness but provided a specific example for why certain things should be protected.

*Shelly: "...that makes sense because.. you know what's happening is... A lot of the new agers are...horning in on. traditional ceremonies. and look at that guy that killed all those people in his big giant tent sweat house... so... sweat ceremonies. They're sacred. and we... know how to do a sweat... (but) he loads people into a vinyl. thing. and steams them out and kills them..<sup>137</sup> and then that reflects on... the native people. so. Honestly I wouldn't share our ceremonies... I mean if they want to know how we set our table and talk about it and use the words that's fine. if you want us to talk to you about how to wash the dishes in the language that's fine but. not anything about our prayers. about our sacred ceremonies... None of that stuff should be... public... If people start talking about our medicines and stuff... that should be protected. Plus the other thing is. like our food. is sacred to us. and now you have people... up in our berry fields. picking huckleberries and making soap and candy."*

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<sup>137</sup> Although she was not able to confirm it, the story Shelly was most likely referring to was the case of James Arthur Ray in 2009 (Karas & Hayes, 2011).

Shelly continued with an anecdote about current conflicts between Yakama and non-Yakama people over local wild food gathering, returning to who certain topics of information should be protected by.

*Shelly: "...brings up another thing too that needs to be protected. We have a lot of our ceremonies that are... for healing the mind and emotions...and those... You can't be messing with that stuff. If you're not brought up in it. and you have no idea you should not be. You should not be messing around with any of our stuff.... start messing around with these things. they could get sick. When we are in ceremonies we have really strict rules."*

Other participants commented about how restricting access for various reasons could be detrimental to language revitalization efforts. Bob expressed concerns about past attempts in which central archives had failed because of a lack of updates and interest or access restrictions, saying:

*"...because if nobody's adding to it. then it's just hanging there... It probably still has... unique... web address. or something. You could still go there but nothing's changed.... but one of my concerns is. similar to what he [Mike] was saying about. the treatment of the. recordings at the... University [Heritage]."*

Bob's goal was to see a repository that was "...not in just one place and not really specifically controlled by any one person or entity"

Below are lists of the participants' responses regarding what should be password protected in the archive. Above each sub-list is a category name with the total number of comments listed in parentheses.

*Responses to the question: "What kinds of content should be password protected in the archive?"*

**All (4)**

- *all content*
- *All of it should be password protected, but with use similar to a library account.  
Copyright is important as well.*
- *Only tribes speaking Ichishkin should have pass words*
- *password? well whatever a teacher code would so the archive would have different districts to log in*

**Some (7)**

- *specific references to cultural restricted areas and topics*
- *personal*
- *the alphabet and words*
- *Cultural*
- *ceremonies*
- *Cultural*
- *Religious material*

**None (5)**

- *Nothing*
- *none*
- *none*
- *Nothing*
- *none*

**Don't know (6)**

- *Ask Virginia Beavert*
- *i don't know*
- *i dont know*
- *i dont know*
- *I don't know*
- *not sure*

**Not applicable (4)**

- *yakama1855*
- *Well there should be some type of agreement.*
- *SAHAPTIN*
- *work*

The three participants who commented that all content should be password protected include one “teacher” and two “others”. Students were generally more supportive of open access. Over all, though, there was strong support for protecting cultural information and ceremonies—a course of action generally supported by the stakeholders’ interviews as well.

#### 6.6.3.4. *Politics*

When I mentioned the idea of approaching the Yakama Tribal Council for oversight Harry said, “*I think sometimes you go... (to the) council. You are. I think I'd go directly to the language program. First.*” Harry cited local politics along with my position as an outsider as

potential impediments, saying, “...and especially... Somebody like you asking it... is a little bit harder for the council to be reluctant to say well. Why do you even have that sensitive knowledge... so any cooperating in those efforts because it is a political game even within tribal communities as well.”

When asked who should oversee the content and who should decide who has access, Josie answered, “we don’t want a committee. That’s a big fight. If we... do that. it’s better if we just like leave ours in the language program. and leave it up to the people who have actually been there the longest... Who know the agreements between ourselves and the Elders. Who wanted to do the work.”

Virginia, meanwhile, had this to say about the tribal council’s predicted position on access:

*“I know the tribe is. totally against. free access to everybody... so they would be. pretty upset. Well. a lot of this is on the internet anyway.”*

*“..See. in the past. they were so against teaching the language. that. uh.... it came to the point where um. anybody in the council was elected was. told not to. not to help anybody that’s doing it... even to the point where. I wrote a proposal to... I guess it was ANA [Administration for Native Americans]. and I got a big grant. and it came in. they didn’t even tell me... I did it through the tribe. [Someone] warned me... [he/she] says. I don’t know. (Virginia)... I don’t think you’ll get it through the tribe. You should do it on the outside... Oh I want to go through the tribe. Ok. They wanted to give it to an ex. councilman who needed a job. so... and they couldn’t give it to them because I had my name on it... so they sent it back... and next time. there were three council people who*

*supported (me). two on the tribal council. and one general council. and all three got put out of their. jobs... I don't think it's happening now though... we have younger people in there now who are concerned about the language..."*

While on one hand political oversight is seen as a necessity, most of the respondents also expressed concern about involvement. Some cited anecdotes off the record illustrating their belief that language education efforts had been impeded by political intervention in the past. A common suggestion the Indigenous respondents provided was that I, as an outsider, should know what I was getting into before approaching the government. As Josie said, "That's a big fight."

#### 6.6.3.5. *Accessibility*

After Harry expressed concerns about people in other countries getting access to materials, he emphasized that *"As far as for the community. it definitely needs to be accessible. but there's people out there that want things to go and use them for the wrong reasons."* He later provided an anecdote about previous materials only being accessible on a few *"computers on the rez"*. Unfortunately, he and I were interrupted, and Harry did not get a chance to explain how people might use the language for *"the wrong reasons"*.<sup>138</sup>

After raising concerns about the language not being used in the home as often as she would like, Donna said, *"online resources are great because it's something that a family can sit down and do together."*

Diane similarly supported the use of the language in the home, adding that domains outside of the home and school should be reclaimed as well. She was in favor of substantial

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<sup>138</sup> Other participants mentioned concerns about the distribution of things like food secrets, medicine, etc.

security for the materials, though she added, *“but it needs to be accessible. in a reasonable level. because that was what it’s really all about...”*

Both Mike and Bob expressed some frustration with the password protection on the beta archive. Bob said, *“I looked around. on that site and couldn’t get anything to work... We’ll I mean. everything was password protected... when I tried to listen to something or hear something or open something. I guess I can’t look at anything.”*

Mike, meanwhile, had this to say about a potential online course module:

*“This could be something they could do outside of the classroom. on their own time. It’s. I think it’s exciting... that uh. people here and in Warm Springs and Umatilla. could access. I like ambitious.”*

All responses to the question on the survey asking, “Would you study Sahaptin if you had access to a class or materials?” were “yes”. Students were asked, “How interested are you in having an option to study Sahaptin online?” and provided with three options: 1) Not interested at all; 2) Somewhat interested; and 3) Highly interested. No student selected option 1, “Not interested,” so the breakdown was 23 responses of “Somewhat interested” (88.46%) and three responses of “Highly interested” (11.54%).

#### 6.6.3.6. *Summary of the security-related data*

To summarize, a common view expressed in this section of the data was that Virginia should be the decision maker for access, though Virginia did not feel comfortable making a decision at the time of interviewing. There was almost an equal amount of support for and fear of Tribal government oversight. The primary reasons cited for the hesitancy around allowing

governmental control was a history of divisive politics and bureaucracy. On the other hand, while not as widely mentioned, the Yakama Language Program was seen as a favorable option for oversight, and further issues surrounding this matter will be explored in subsection 6.9.1.

Some of the most prominent stakeholders supported completely open access to all materials, but the majority perspective was that culturally sensitive information, such as ceremonial, food or medicine related knowledge, should be protected. Excessive security was seen as a cause of failure for previous projects as well as an ongoing problem plaguing enrolled Yakama members who taught the language as excessive security restricted access to certain resources. Some of the participants cited the precedence of the publication of the dictionary as an example of either a view that the language is already unsecured or that there is no risk in open access for general language materials. Participants were much more likely to feel comfortable opening access to local non-Yakama residents than to “foreign” non-Yakama people with Europeans being the most common example. Outside of food, ceremonial and medicine related information,<sup>139</sup> no specific examples were given as to how the language could be misused by non-Yakama people, though there were a few concerns over outsiders somehow profiting from the language itself. Several participants expressed a need for cultural protectionism while others saw the Yakama Nation as being only moderately protectionist when compared to the language policies of other U.S. Indigenous Nations. The dominant view for why open access is needed was because of a lack of teachers and speakers of the language, as well as a lack of linguists. 70-

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<sup>139</sup> Some basic ceremonial and food related information is contained in the archived materials.

75%<sup>140</sup> of respondents supported the content being available to non-Yakama or non-members of Sahaptin-speaking Nations, and only 14-17% were against opening up access.

The core issue inherent in restricting the content available to those on the outside was that restriction of outsiders could actually reduce access for Nation members as well. Some respondents saw passwords as negative in general and something that impeded legitimate students from accessing the materials whether due to confusion, frustration or bureaucracy. Outside of a soft institutional gatekeeping (e.g., similar to the approach provided by Heritage for existing language classes) there were no clear examples of how a password or other security system would function. One of the stakeholders raised the issue of how a gatekeeper would determine if someone had a legitimate right to access the materials, asking: Would people with access rights only be enrolled members of the Yakama Nation? What about other Indigenous heritage individuals that reside on Yakama land, such as family members of Yakama people? How could they prove they were members without sending a scan of their enrollment card to the gatekeeping organization? The general consensus, therefore, showed a near universal concern for accessibility, which was expressed as being vital for family participation as the accessibility of online content could be positively viewed and would seemingly increase the pool of learners. The emphasis on accessibility is supported by additional data sources for this needs analysis that will be presented later on (e.g., §6.7.11).

#### 6.6.4. *The hosting institution*

The discussion and comments in this subsection relate to which institution(s) should be in charge of the online course module and archive. The main institutions discussed during the

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<sup>140</sup> This range is because of varying interpretations of the responses based on contradicting follow up comments. This possible ambiguity is discussed in subsection 7.3.

interviews included the UW, the University of Oregon and its Northwest Indian Language Institute (NILI), and Heritage University. The primary connection between the UW and Yakama language revitalization efforts is Prof. Sharon Hargus and her work with Dr. Virginia Beavert, which includes the Sahaptin dictionary project (Beavert & Hargus, 2009). Dr. Beavert was awarded an honorary doctorate in 2009 by the UW. NILI at the University of Oregon, on the other hand, has a fairly strong relationship with Yakama language activists and educators. In addition to a faculty member recently publishing a grammar on Sahaptin (Jansen, 2010), some local language instructors studied at UO. This includes Dr. Beavert, who earned a Ph.D. in linguistics from UO in 2012. Heritage University, meanwhile, is located in Toppenish and has ties to the Yakama Nation geographically, historically, and through centers and conferences. However, only 6% of students are reported as being “Native American/Alaskan Native,” and Heritage is not officially affiliated with the Yakama Nation (Heritage University, 2015).

Diane noted that currently anyone can enroll and take courses at Heritage University, saying, “*They do not have to be Yakama. but they have to be a Heritage student... to be enrolled in the class.*” She said Heritage offers options for community members to take courses for free but believes the Yakama Language Program might be a more efficient host for an online course.

In regards to Heritage’s options, Bob agreed with Diane, saying, “*I don’t get how... going through Heritage it makes it more accessible to everybody.*” However, like Diane, Bob also mentioned how Heritage classes are free to community members when not taken for credit, implying that accessibility is more than just an issue of finances.

Mike also discussed Heritage, beginning with his personal history with the institution.

*Mike: "...But it's. it's not. they like to say that they're... like the. the Indian college on the reservation. you know. They're the Yakama Nation's college or university and all. A lot of people don't see it that way... for reasons like this. Virginia did a lot of work out there... Did a bunch of recordings. Members of the community did recordings. (Others) working for Heritage doing these recordings and... those recordings got locked up. and. people don't get to use them. They didn't do anything with them. and. there are members of the community that are involved with the language that know that and aren't very happy about that. and then if you. Until recently if you wanted to take a... class out there from. somebody like Virginia... you'd have to pay a hefty sum. and it... just. wasn't accessible. and it's. I guess it's a little better now. but. I don't. see... what advantage there is to have it locked up there with Heritage or. affiliated in any way... Why can't it be open? or. like how UW does... that dictionary. It's there for anybody. (laughs)... but why couldn't... you just click on a button. Just like you do the dictionary. and you know. get.... access to these... modules."*

The first comment Shelly made during our conversation was about a disconnect between academia and the community: *"you know... It's really good that... the universities are trying to save the language. but it's not getting out to the people."*

Virginia, similarly, was in favor of the University of Washington hosting the course and materials. She said, *"Everything is published there it seems like. and besides. they've been good to me. It isn't that. I wanted to (just) keep (it) in the state. you know."*

Questionnaire participants were asked to rate how comfortable they were with certain institutions hosting the archive and course. They were presented with three schools and a third

option of an “other” institution. The results of their responses are provided below in Table 7. One participant did not respond to any of the questions while three responded with the “other” option.

*Table 7 Opinions regarding a long term host for the course and archive*

Question text: “The course website might be located on a University of Washington computer/server, but there are other options as well. People will be able to access it online. Rate each of the following according to whether they would be a suitable long term host.”

#### **University of Washington**

(1) Not at all comfortable	1	2.86%
(2) Not very comfortable	1	2.86%
(3) Neutral/no opinion	10	28.57%
(4) Somewhat comfortable	11	31.43%
(5) Completely comfortable	12	34.29%

Mean score for the 1-5 scale: 3.91

#### **University of Oregon**

(1) Not at all comfortable	0	0.00%
(2) Not very comfortable	1	2.86%
(3) Neutral/no opinion	7	20.00%
(4) Somewhat comfortable	10	28.57%
(5) Completely comfortable	17	48.57%

Mean score for the 1-5 scale: 4.23

#### **Heritage University**

(1) Not at all comfortable	0	0.00%
(2) Not very comfortable	3	8.57%
(3) Neutral/no opinion	6	17.14%
(4) Somewhat comfortable	7	20.00%
(5) Completely comfortable	19	54.29%

Mean score for the 1-5 scale: 4.20

**Other:**<sup>141</sup>

University of Gonzaga	Somewhat comfortable
Tribal websites	“Not very comfortable (They are poorly managed. Lack efficient updates, sometimes not working at all.)”
Yakama Nation Tech centers and Library	Somewhat comfortable

In summary, some participants felt there was a disconnect between the tribe and universities. Others had very positive things to say, particularly about NILI. While it is important to respect the wishes of the stakeholders, not all of the organizations listed have the infrastructure to support the archive or online course—an issue that will be further explored in subsection 6.9.1. Now that we have a better understanding regarding attitudes about the eventual home of the archive and course, the next two subsections focus on the desired structure, user interface, and management of the archive.

#### 6.6.5. *Organization of the archive*

This data was collected during the co-current design phase (§6.4.2). Participants were given a demonstration of the archive system both from the visitor and administrator’s perspective. They were also able to interact with the system and ask questions for as long as they liked. This section is concerned with comments related to whether the organization of the archive was intuitive, the interface user friendly and the features representative of what the participants wanted to see available.

Ronette, a Yakama citizen and language activist, was particularly happy with the tagging system for searching materials while Mike and Bob thought the categorization page seemed like the best way to find materials.

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<sup>141</sup> Participants were able to supply and rate another institution if they wished.

Laura, meanwhile, talked about the need for good archiving practice and technology:

*“I don’t know but I’m excited to learn more about that because I have been trying to chase this for years and like how am I going to do this because I’ve just got files and files and files and. I’m just like man there has to be a way and I’m constantly asking, wherever, like programs I go. How do you guys archive? What do you guys do? and everyone’s just like. Well you know. There’s not like a good set way that everybody does it yet.”*

Donna had the following opinion about the archive layout:

*“I think actually. Given the...materials you have and the format they are in. These are beautifully accessible.... I think... in terms of looking at stuff and the categorization is great... I was playing a little with some of the categories and with some of the tags. That seems really straight forward.”*

Donna was in favor of retaining all of the detailed administrative documents even if they didn’t contain any language content, saying:

*“I love that you can go, and find the syllabuses, and then go. Oh! Well here’s how Virginia would structure her class.”*

She added that having some potential redundancy in the content was probably the safest route.

*“it’s hard to know and again, thinking of the... individual whose work you are archiving different versions contain different information sometimes and you don’t want to necessarily lose even if it’s just a couple lexical items. It’s hard to make the decision to say all were not going to put this up here.”*

Nadine also saw value in the myriad of administrative papers. She said she liked “*to see the progressions*” of how the course developed over time, though she did think it would be valuable to “*spice*” up the interface, and add some tutorial videos on how to use the archive and provide the creation date of the materials.

Donna suggested the archive be made more useable by making the content as copy/pasteable as possible (§5.6.6). She recognized the limitations of OCR for Sahaptin, especially in case of roughly printed or written materials, but had the great suggestion of integrating any original text documents (e.g., .DOC, .TXT files) that might be uncovered. Embedding the text into a page may still present some problems for font rendering but will allow for copy/pasting and could be a better option than typing everything in by hand as the material could be downloaded and opened on a visitor’s computer once the proper font is installed.

To summarize, there were very few specific comments about the archive’s organization, but the general response was positive.<sup>142</sup> Multiple administrative documents and duplicates with slight variations were seen as advantages due to the searching and tagging system. There was some frustration with the password system, though, and it was generally agreed that adding video tutorials on how to use the archive would be favorable.

#### 6.6.6. *Errors in the archived content*

This section collects responses related to how mistakes in the archived materials should be treated. The question was explored from a few angles: Is it okay if the archive contains errors? How should these errors be corrected? Who should be in charge of correcting the errors? How

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<sup>142</sup> The questionnaire participants were provided a link to explore the archive and comment about usability and what they would like to see. All of the comments were very general but positive (e.g., “I can learn more about the yakama traditions and culture in my local community”), and were not relevant to the topic of this subsection.

should information on the errors be presented (i.e., Should the original document with the errors be retained while corrections be added to the new resource? If so, how should the annotations be presented? (§5.6.6)? Basically, I was interested in learning what the participants believed was an ideal situation, what they thought was feasible and what kinds of compromises between accuracy, authenticity (of the original resource) and expense (e.g., labor) they would support.

Donna mentioned mistakes are a natural part of developing language materials and said, “*perfection is not always where we get.*” Because perspectives on what is correct may change over time and common errors may be overlooked for quite a while, Donna suggested students should remember:

*“They are not learning a language... with a long written history... and if they run across things that might be spelled differently than the dictionary or might have a little different translation... they might look at it and go... I really think that’s a barred ‘I’... That’s part of learning. Languages. accepting that there’s some variation. accepting that it’s in.. and early stage. oh. in written. and... at the same time. if there were things here that... Virginia in particular was looking at and going. ooh. I’m not comfortable with that. Then I’d imagine that those are things that could be noted.”*

In the end, Donna argued correcting errors was a matter of feasibility and it might be best to focus on the mistakes the elders and experts, like Dr. Beavert, deemed a priority.

Diane similarly was not too concerned about leaving errors in the archive, both as a means of preserving the original materials and not delaying the distribution of them, but she also suggested errors be annotated. While she didn’t have a specific suggestion for how annotation should be handled with the current technology involved, she stated:

*“I would definitely annotate. because. I remember taking the classes. and there was a point. in which. the opinion of how to spell something changed... and there was quite a lot of ( ) between students that have been studying for five years. and. Going forward... maybe a change in consensus of the speakers... and maybe new knowledge on the part of the particular elder involved in it. so... going back and finding something else and. revisiting...and mixing these two together... so yeah... If we didn’t annotate. the folks that don’t have the advantage of an elder. could carry forward the mistake.”*

Nadine recognized the challenges inherent in fixing all of the mistakes but agreed the annotation and identification of mistakes was important, considering the varying types of people who would be accessing the materials (i.e., beginning students vs. teachers).

Virginia, meanwhile, provided some background on the errors present in the materials, saying:

*“Well... There are mistakes in (there) somewhere... The linguists. decide they know... all about it. so they start out doing things without consulting me. (laughs)...and then. when I’m editing it. I find it... so... Some are pretty major mistakes. but...I’d rather have record... corrected. before it goes out. Then there’s small ones. you know. Everybody makes mistakes. but...in grammar I think it’s important... (that) the major ones are corrected.”*

To summarize, mistakes are seen as inevitable due to the process of developing materials for an endangered and previously unwritten language, and fixing the mistakes is not seen as necessary as long as there is adequate annotation. Instead, the universal view was that annotation of the errors is more practical than correction, though such a procedure would require substantial

effort and collaboration—a step which will be discussed later on in subsection 6.9.2.5 in the context of the needs analysis and which was explored further from a technical and archival standards perspective in subsection 5.6.6.

6.6.7. *Course format (e.g., hybrid, self-paced)*

This section looks at the opinions held by the stakeholders and the questionnaire participants regarding the ideal format for an online course. There are connections between this issue and accessibility, which was discussed in subsection 6.7.3.5. The debate at its most basic level is whether resources should target classroom learners either in the context of a classroom or as supplementary content or learners who are more isolated, do not have access to a classroom, may have affective concerns with existing class-based options or may simply prefer a different pedagogical style.

Donna saw the value of having a self-paced course but stated community and learner interaction was vital as well. *“I think having an asynchronous component is critical for learners... and at the same time. people I think appreciate...the opportunity to feel like they are in a community of learners.”* Donna added it would be ideal if additional modules were included in the archive and shared throughout the community, saying:

*“...it can build up additional resources. by people feeling comfortable to go to one another. without necessarily going through the course... especially with the learners who are. a little more advanced. and who may be our teachers themselves... to then be able to think. Oh you know. So and so said that he had a unit about that. how cool. I want to use that or I want to learn about that. so, it’s kind of a spinoff from what’s online...”*

Virginia, preferred to see a standalone course module that people could access from home. Additionally, she stated it would be nice to have something parents could use to teach their children, though she thought it would be good if the course module could support the classes at Heritage as well. *“It should really get into the class where it. (is taught at Heritage) and then gradually getting it out. to the public... because some of those students are... funded by the tribe... and they want the. students to. learn right away.”*

Table 8 contains the participants’ questionnaire responses on what format the course should take.

*Table 8 Responses to the question: “The course will be accessible from web browsers and will help students practice and learn Sahaptin. Do you think an online course module on Sahaptin should be...?”*

Hybrid - used as part of a course in a physical classroom (example: for homework).	12	33.33%
Stand-alone - something anyone could take on their own.	20	55.56%
Other (explain)	4	11.11%

The “Other (explain)” responses included:

*“Something that could 'stand-alone' but is also useful & useable for a physical classroom.”*

*“Both. Each learner is different. Some people are more self motivated while others need instruction, guidance. It could be a very useful tool for homework.”*

*“Either hybrid or stand-alone”*

One of the responses for “Other (explain)” was “class” and likely could be counted as a vote for “Hybrid.”

To summarize, the majority of participants preferred a stand-alone, self-paced course, but there was support for hybrid-style content, particularly for the courses at Heritage. The issue of community was raised in the context of a stand-alone course, and participants asked, “How can we promote a sense of community if people are studying in isolation?” A possible solution would be to provide tools such as forums, teacher and mentor moderation and student collaboration, which could eventually be integrated.

#### 6.6.8. *Target populations*

The topic of this subsection is related to the issue of the online course format that was discussed above but takes a particular focus on how the pedagogy should shape the content. While the course may have a hybrid format, the content in it could be developed to target different groups, including younger learners, intermediate college age learners, etc.

Donna believed the first priority of the archive should be to support families with young children, though she stated teachers should receive second priority as they are another valuable target population.

*“The teachers really need support...So in order to get to the preschool...the second place is really important to go... there needs to be enough folks who have the... language skills and the dedication and the teaching skills. and the... desire to be teachers... If you don’t have...that group of teachers...your student population. Nothing’s going to happen.... so the second then. Teachers. The first group I think...that’s so critically important. It’s young children... I think for language revitalization () it’s got to be the family. (If) you reach that family through a preschool or school program that’s great. And that’s the only way I know how to. I could possibly go about reaching the family but that at some*

*point if it's not... brought home. You really only have folks with the classroom knowledge. and that's not. that's enough for a lot of things. It's not language revitalization."*

*"For an online resource I think it's nice if you target different levels of learners. So then again if you have people who can't count and people can put together a sentence... well it's great to have both of those things in there.*

Nadine agreed with Donna's view that it would be good to have online support for different levels of learners, particularly those studying beginning skills easily learned in isolation, such as orthography. She believed there was a need to support teachers so they could more effectively educate children. This support Nadine said could come in the form of materials or training. However, she decided the group that might benefit the most from an online course were middle-aged adults who didn't have easy access to classes.

*"Kids... can get this in the schools. We can start teaching domains if everyone wanted to do that and then so having support for parents of those kids. which could also translate into support for. learner teachers.... Because I feel like there's some overlap in that age group and so there are also the heritage speakers... and heritage learners. There's all kind of research now about how they... have different skills... than just straight beginners... So I think supporting that age group. the heritage learners. the next Elders. is a really important population to target."*

Shelly, meanwhile, discussed whether kids were the most important group to target, saying:

*"...they are. But what you have to do though is keep going you can't stop. (once they) get out of Head Start. because they're going to lose it. Their parents don't speak it. and if*

*there is no one to reinforce it. They're just going to get pulled into the regular education system."*

Diane, furthered Shelly's comment about the need for continuity:

*"I think right now. there are... more programs focused at children. and then I think there's a big break for middle school. and then the next level is picking up at high school. I'm guessing, except for some major universities..."*

The gap in continuity from K-12 was touched upon by some of the other participants as well. Shelly believed it was important to teach older kids (i.e., middle school and high school aged kids), so they, in turn, could mentor and teach younger children—a system which would be good for all ages. Shelly's conversation then turned to whether there were any local efforts being made to teach parents the language so it could be used in the home.

*"We're trying to. We're trying to. We don't have a language nest right now but... Chinook Wawa they have a language nest. and Hawaii. That's how they started out. It was a group of families that started that. So all of those families were learning along with their children. So they graduated their first group a few years ago and now they have. Their languages talk all the way to college... parents have to be involved. The grandparents have to be involved..."*

When asked what level the online course module should specifically target, Diane said:

*"I would say. Intermediate. About the third semester. Third semester language classes. First and second almost anybody can do with what's out there. but... after the () of that basic vocabulary. The basic syntax. The basic speaking... third semester. So what do*

*people try to achieve in third semester. or... if it's in the quarter system. I'd say probably. the beginning of the second year.... building on what other folks within this community are doing... Right now. we can't teach third year. because. we don't have the resources and we don't have the students going forward."*

Bob furthered this discussion by suggesting Head Start students might be a good group to develop some interactive content for, saying:

*"...They don't got much money. They don't got much of anything. They got these super ancient computers. They got this one program... so you can also learn a little bit of French. Chinese. or. Spanish. and what they're doing is pretty simple. It's a cartoon guy. and it's like. Can you put it. Give him some blue boots? and. click on the blue boots and you drag them over. Good job You did it. or... I'm sorry. That's incorrect. or something like that. and... it seemed like it wouldn't be too hard to do some type of a. Ichishkūn. whether it's simple at first. or whatever and it's just that whole drag and drop thing and you'll get the correct answer because... They really need that. out there. and that would be real cool... because the kids. They would be using it. four days a week."*

However, the last time Bob checked, the Head Start program did not have available internet access.

Shelly's opinion was that there was an advantage to developing isolated, standalone modules for a variety of levels so people would be encouraged to develop new content to fill in the gaps. *"...Then they could. dig around and find something else and then maybe. later on somebody could put in... something more advanced?"*

Virginia, meanwhile, believed the current generation of adults in the Yakama community were focused on their grandchildren.

*Virginia: "I think everybody's looking for their grandchildren now. or their little ones... they don't really care about themselves anymore. but they (want) the grandchildren to learn. and this is where (someone)... is really involved in this Head Start. and I'm involved in Head Start in Umatilla... boy those kids can count to a thousand. in the language. and they're Head Start children... Their teacher made a book. with action pictures. All they have to do is look at the... picture and (they will) tell you in Indian what's happening."*

Table 9 and Table 10 report the results of two questionnaire questions asking about the ideal target audience for the proposed course module, though it should be noted the responses in Table 10 do not pattern with the age or status (e.g., student) of the respondent (i.e., some adults selected "K-12" and some youth selected "Adults").

*Table 9 Responses to the question: "What level of learner should the online course module be designed for?"*

Beginner	24	66.67%
Intermediate	10	27.78%
Advanced	2	5.56%

*Table 10 Responses to the question: "What age group should the online course module be designed for?"*

Pre-Kindergarten	0	0.00%
K-12	24	66.67%
Adults	12	33.33%

To summarize, this topic presented the most notable distinction between the stakeholder interview data and the participants' responses on the questionnaire. The majority of the questionnaire participants were K-12 students, and as such, favored focusing on K-12 education about twice as often as adults. None of the participants selected Pre-K as a priority though a few of the stakeholders did suggest Head Start as a deserving population. The advantage of focusing on Head Start would be that the materials would take fewer resources to develop (§4.2.8) as the complexity of the desired content is limited (§6.9.2.3).

Two other themes emerged through the data, the first being the issue of the parental support needed to foster language practice in the home and the second being the issue of educational continuity. The dominant gap in materials seems to be in those for intermediate learners as well as in those for middle school students. The questionnaire participants preferred beginner level materials, but many of them were also beginner level students and described themselves as such. From a learner-oriented needs analysis perspective, this view needs to be taken into account, though it should be balanced with the reality that the majority of existing materials do cater to either a beginning level population or more advanced learners (§7.1). A few stakeholders expressed a strong disinterest in reinventing the wheel with regards to the resources targeting beginners as doing such might duplicate existing work. One stakeholder's comments inspired the idea of mixed modules targeting different levels of learners, which would promote collaboration and the possible development of further modules until all key gaps are filled.

### 6.6.9. *Content types for the archive and course*

The discussion then turned to what kinds of things should be included in future online resources. Opinions expressed may have been built upon a knowledge of gaps in existing classrooms or simply upon beliefs about effective pedagogy.

Shelly said she thought the course should, *“Start with simple things. that they could memorize. and then that will spread their interest in going deeper.”*

Table 11 shows the responses to the questionnaire concerning which specific types of language content the course should contain. The responses for “Other” were: *“Ways to provoke everyday use, such as typical conversations, daily routine and even expressions in casual talk,” “all of the above” and “conversational terms.”*

*Table 11 Responses to the question: “What are the three most important aspects of the language that the course should cover? (select up to three)”*

Grammar	22	62.86%
Sounds/Writing System	25	71.43%
Vocabulary	24	68.57%
Culture	15	42.86%
Other:	3	8.57%

Table 12 looks at the participants’ opinions regarding tasks and domains. “Talking about kitchen activities” was included because it was a common theme raised by the interview participant stakeholders and was an example of a specific domain or task that might inspire the stakeholders to list something in “Other”. Additional responses to “Other” included: *“everyday activities”, “all of the above”, “numbers, animals, vocabulary,” and “kitchen and all other everyday activities”.*

Table 12 Responses to the question: "What kinds of tasks would you like the course to teach?"

Simple conversations with family and friends	29	80.56%
Using numbers proficiently	0	0.00%
Talking about kitchen activities	2	5.56%
Other (Please list)	5	13.89%

Even so, there appeared to be little additional interest in language for the kitchen and even less for materials on numbers, but because the responses for “everyday activities” was included in the analysis of the data, it became apparent some domain-specific content might be of value. In general, though, the participants still preferred conversation-related material.

Participants were asked, “Do you have any specific ideas about the types of language skills/tasks that should be covered? If so, please share them here.” Only two students responded to this question, providing answers of “*grammer*” and “*singing*”. The non-students’ ideas included:

- “*Help with pronunciation.*”
- “*daily interaction conversatios daily living instructions*”
- “*sounds, write, and read, conversation follow Ichishkin language bench markd as*”
- “*gutting and skinning a deer, cleaning and filleting a salmon, building a sweathouse, making a tule mat, and other culturally relevant activities*”

One participant had much more to share:

*“Work, different jobs, going into peoples' different interests. Ie: fishing, cutting wood, school, office, managerial, business, art. This will help people to see hw they can relate language to their life journey. Also, it would be great to cover ways in which an*

*individual can teach language to their peers, ways to pass it on like in the office or among relative. Simple peer teaching activities that can spark an interest and get a community environment going.”*

The dominant opinion in this data was that the focus should be on everyday language. If it had to extend beyond that, domain-specific (e.g., business, art, etc.) language was of interest as well. In other words, there was more interest in focus on meaning and task-based content, but participants also saw some value in a focus on forms approach and possibly on pure, explicit metalinguistic content—the issue of which is explored in the following subsection.

#### 6.6.9.1. *Grammar and metalinguistic content*

When asked about grammar and a focus on forms education, Donna stated she did believe a focus on forms had a place in language teaching, saying, “...*Virginia. She does do some focus on form.*”

Donna also raised the idea of focusing on the language and not the culture in the online system as doing so might alleviate concerns about security. She added that while culture and language are inseparable to some degree, sensitive cultural information can be omitted and the language (i.e., the grammar, the phonology) can be emphasized, stating that not only is an online course module inappropriate for storing sensitive cultural information, it isn't necessarily the proper place for people to receive that kind of education.

*“...people are going to get that elsewhere. from their families or from their Elders. so to a certain extent. I don't know if it's focusing more on language or. you know. being clear that this is the purpose...”*

Nadine's opinion was that there should be *“minimal grammar explanations but maybe some supporting documents if they wanted to go there.”* The one specific topic she thought might deserve a course module was “transitives”, but she believed even these might be best delivered in the context of a domain (i.e., task).

*“Transitive constructions our something that are really complicated and... really need to be kind of broken up into small manageable chunks... some of those constructions because it's complicated and... There's a lot that goes along with it... but. in the context of a DOMAIN. or in the context of just... practicing... and it could easily be... in the kitchen for instance... like give me the potato....or give this to your little brother... So making that less of a scary thing. Less of a linguisticky thing and more of a how do you...use these when you talk to people.”*

Mike and Bob both thought tense, aspect and morphology would be good starting points for the online module. Shelly, however, admitted the online module would:

*“...be good... to have Virginia's... sound files on the alphabet... but (those are) in the dictionary... on the UW. site... (but) yeah make it more user friendly. because... I haven't quite. (figured out) how to use the dictionary that's online yet... (maybe) Kind of lump of words together that might be used... Maybe in house cleaning. Maybe in... planning a dinner or. you know things like that... or playing outside.”*

As for grammar, Shelly thought morphology would be a good topic for more advanced learners, saying, *“Because you do have to get used to it. How everything goes together. Because we have prefixes and suffixes and in-fixes. and it's like WHAT! I'm still learning all that.”*

Virginia, meanwhile, mentioned curriculum development as something that is needed right now and quickly transitioned into talking about grammar education.

*“Curriculum development. has always. been. the foremost I guess... because. we don’t have any. [Dr. Joanna Jansen’s] grammar’s the only one... I wanted to develop one that would target those who. didn’t take classes. and wanted to learn... They could listen to me. and maybe I could explain some of the... meaning... and explain where the verbs are. and nouns. adjectives in the language... which is the way I started. in the beginning.”*

Virginia discussed how metalinguistic content can be a stumbling block for many learners and suggested more scaffolding could help retain learners to some extent.

*“Because. these adult classes. (at Heritage) They start out with... a full classroom... gradually they start dropping out because they don’t understand the linguistic part of it...so... I don’t like dictate (to them)... what to teach. and how to teach... but...maybe... start with the alphabet. They have to know the alphabet and there’s a lot to teaching the alphabet. You could use a whole year to teach that. because. you have to teach them writing too. and then. then your (structuring) would come in the second year.”*

Virginia also saw value in including content on the phonetics and phonology of Sahaptin while providing anecdotes about working with more advanced learners.

*“I know some of those words are hard... but I tell them... Don’t always try to look handsome. Twist your face around and. your mouth. Say those words...because sometimes (someone) doesn’t quite get the sound. and I just hear it once and I know what it is. So I’ll. I’ll say it for (them)... then write down the word and. Then (they’ll) say it. (They) can say it. you know (They’re) pretty good at that. but. (They don’t) quite*

*recognize some words when (they) first hear it. because (they're) not familiar. Well. once (they learn) it. then (they don't) have any more problems with it but. when... the elders start talking and using this old language. boy you better keep your ears open (laughs)... they talk fast. especially if they get excited about something. You know when they are talking about history for instance. you know. They get emotional. and their words start coming out fast."*

The stakeholders expressed an interest in explicit metalinguistic resources. In addition to being potentially less culturally sensitive than other content, there seemed to be a particular need for instructors and more intermediate learners to have access to this type of content.

#### 6.6.9.2. *Domains*

Domains were a common touchstone for the stakeholder interviews. They are often seen as a way to limit the required language fluency by limiting the semantic classes and by having a set amount of phrases. This is a way of localizing immersion, and many participants see great potential in it.

In regards to domains, Donna said:

*"...it's great for people to have some examples of language think they can. that they can pick up and use... things for mothers to say to their kids at bedtime or. how to tell someone how to make a sandwich. So you know. in terms of revitalization. I'm all about that kind of language..."*

Mike said he already teaches modules on classroom and kitchen/dinner-related language, and when asked for a different specific topic or domain that might be useful, he suggested "visiting."

Shelly gave the following example about a specific domain that could interest kids:

*“Basketball players want to learn how to say words in the language so they can... talk about what they want to do. without somebody understanding them. Well then they’re going to get interested in... how can I talk to. my friends without my little sister knowing what I’m talking about... just like our parents use to do to us.”*

I asked Shelly if there was already existing content on basketball and if there might be other similar domains or tasks that haven’t yet been explored. Shelly responded by saying, *“...well you know things like fishing. hunting. [another teacher] is working on hunting. So (they) started some of these things...”*

When asked about domains and tasks, Virginia also discussed kitchen and visiting language.

*“I think over at... NILI... we found out that. going back to the domestic. part would be the best. Where they had two of us and sit down and talk to each other. Just common dinner language. Or you know. two women talking. First it was the kitchen. I was sitting there... One child came in... and he said. Is breakfast ready yet? you know and I’ll... say... What are we having for breakfast? and then I would answer. whatever we are having for breakfast. and then I’d tell him. Well go get your own milk. in the fridge. you know. things like that. (Laughs)... you know. general conversation. Then the next... tape showed a visitor coming. An elder coming to visit me... and I’m surprised to see her and I.. tell her. Oh I’ve been wondering where you. Have you been travelling. and she goes oh yes. I’ve been travelling you know. and she comes in. we’re glad to see each other and*

*then we start talking about what we have been doing... you know. just common language.”*

Some stakeholders mentioned recent efforts to promote domains-based language content and language nests at NILI. It would be ideal to have future course content support priority domains. More consistency in language ability in a single domain (e.g., in teaching many people to order coffee in Toppenish) seems to be preferable to a more scattershot and individualized approach to domain education (e.g., one family speaking Yakama in the kitchen while another speaks it in the car) both for the sake of extending that domain into multiple geographical spaces but also for the purposes of resource sharing and community support.

#### 6.6.9.3. *Advanced technology and activities*

While the questions directed to the stakeholders about technology were initially given within the context of an online language course and the archive itself, most participants were unfamiliar with content and learning management systems and what may or may not be feasible for modern computer assisted language learning. Therefore, it often seemed productive to ask participants what the ideal form educational technology would take for Yakama learners. This meant that some ideas were far beyond the scope of these projects and my skills. However, the participants provided some interesting ideas, and the discussion provided better opportunities for explaining the technology that was available and feasible for the project at hand. Mike and Bob were the most interested in the subject and provided some ideas and questions that were fairly forward thinking.

Mike's perspective on advanced technology had several things in common with the conclusions reached in chapter 4, specifically the need to move beyond simple introductory materials.

*"I wanted...(something) ...adventurous. I don't know what the word is. or. With this online course module... I wouldn't want to see something real basic... There has been recordings out there of the alphabet. even cassette tapes... and its colors and numbers. I want it to be like a real. online course... learning opportunity. something more advanced... Where after you learn the alphabet. and. you kind of. get up to a certain level. this is how you can learn and this is how you can benefit... Anybody can make some flash cards or... just. go get a dictionary or even use Virginia's dictionary. and get. you know. single words. words () a sentence. It's tough learning. It's a tough road to hoe. doing it that way. but I have not seen... an online learning opportunity... We hear people talking about. learning Spanish and French. and in the airport with online. even. clicking on things and... all you hear and see is the language. and there's no... English... that's. what I would like to see."*

Bob built upon Mike's comments, expressing a strong interest in the potential of using speech recognition.

*"Speech recognition and... the whole Microsoft thing. I have seen... with an iPod... (someone have) a virtual conversation with... (their) iPod... It's just back in forth... Now maybe it can't be that advanced... but... even if there's a handful of... because basically it's. simulating conversation. which is a hard (thing) How can you do that?... That's what I would like to see. Some type. maybe there is something they can do. Maybe a*

*handful of answers. and then you answer a question. but then it gets into that whole. (Speaking Sahaptin)... All of those questions. (With the where's)? and then if you were asked () a certain answer. oh. You answered incorrectly or something and then you have to recognize that. recognize the question. () respond appropriately."*

While interactive speech exercises with automatic recognition is not a feasible undertaking for this project, it is possible to have activities that model conversation at a more simplified level. For example, speech could be played to the learner so the learner could select a pre-recorded spoken or written response. Specific feedback would then be delivered based on the learner's response and would guide the learner to the next utterance in the conversation. Alternatively, one half of a model conversation could be recorded with gaps, and the learner could speak into a recording module to fill in the gaps in the conversation. Again, though, there would be no automatic grading or recognition for speech in the LMS, so each response would have to be manually reviewed by a teacher or moderator at a later time, or it could be self-reviewed for practice.

Bob was aware of the software applications being used by other Indigenous language groups, but his interest in them was tempered with a healthy skepticism.

*"Some language teaching software that was as simple as... the word goes across and you have until it gets to the end of the screen to type it... That's your language practice. or. it has a book. Multiple choice. You hit A, B or C. and I've seen the Inupiaqs. Up in Alaska. They have this whole vivo thing... that's all they use. That's the only thing that they use for language instruction. and they swear by it and I was kind of interested in. well... I mean everybody LOVES it. but is. How effective is it. Like is it teaching some*

*language proficiency. Are they getting anywhere. or is it just creating language promotion.”*

Bob’s comments relate directly to the discussion and analysis of current software options in Chapter 4.

While not everything Mike and Bob would like to see is feasible at this point, they were still interested in the more realistic shorter-term options I present. While nearly all participants have a strong interest in utilizing technology, Mike and Bob both expressed a strong skepticism regarding the pedagogical value of certain technological tools. Their comments and observations were particularly interesting to me in light of the proposals made in chapter 4.

#### 6.6.9.4. *Teacher support*

Teacher training and lesson development was another topic of interest to many participants. As there is a substantial variation in training and language mastery among the teachers, which is consistent with the findings for the state of Washington (§2.2.2.3.2), it was necessary to gauge how important the stakeholders believed it was to have resources that supported the teachers’ understanding of the materials and ways to utilize them in the classroom.

Diane argued that having a broad range of materials online would help teachers and classrooms lacking certain types of content or training, saying, “...*a teacher who is say primarily oral in our language. would have access to other materials. so the person can teach a full range class.*”

Shelly was similarly excited about the archive because she believed it would be a good asset for teachers. In regards to both the archive and the course, she said, “*I think it’s gonna be*

*like a godsend for us... it's good when. you know. something is started. and we have a... place to grab it and then we can build from it."*

Mike mentioned he would like to see better organization of the existing materials so teachers could utilize them more effectively. In regards to the online dictionary and the sound samples it contains, he said:

*"...if those sound files were more accessible or you know maybe somebody a little more expert could have them prioritized. like you were talking about. This is how they should be used. and. I'll pretty much. I'll teach what they tell me to teach."*

Beyond the sound files, Mike believed greater collaboration on lesson development between teachers and academics would be valuable.

*"But I don't really... have a whole lot of direction. I remember how (an Elder)...taught us. and then... some linguists. telling us. we should do this as well. and maybe in this order... At least until something else comes around... that's what we're doing... I'd like to... see. an outline of the... curriculum..."*

Mike described how it would be helpful if he had a better grasp of the more complicated grammatical aspects of the language, such as those related to tense, aspect and morphology, citing how he sometimes is asked difficult questions by students and has trouble explaining the details.

*"Being able to explain that. I feel like one of those elders that I ask too many questions of. 'That's just the way it is'. Alright, that's the way I've heard it. (laughs)... Those are just some ideas. I don't know if that's advanced. or. but just. so we know what it means*

*because we have the translation and dictionary. We know how to say it but. I don't know why. I can't. I'm just a regular guy. I can't explain it to them."*

On the questionnaire, only one of the two teachers responded to the question, "How interested would you be in having a teacher's guide related to the proposed online course module?", and the answer was "very."

It is abundantly clear from this data set that content which supports teachers is in great need. On one hand, there is an interest in developing an understanding of the metalinguistic aspects of the language while on the other, there is a need to utilize existing materials and encourage collaboration to utilize the various strengths of community members and educators to improve available content overall. The archive and course sections were seen as potentially very useful for this purpose, although there was some reasonable skepticism regarding the need for people to use both systems and to communicate regularly for such an arrangement to work.

#### 6.6.9.5. *Culture*

Culture was the most commonly-taught subject in the study on Indigenous K-12 programs in Washington state (§3.2). However, earlier in this data set, cultural content was seen as being particularly sensitive and controversial when it came to the issue of access (§6.7.3.3). The data in this section looks at opinions regarding the importance of including or presenting information online, whether in the archive or in the course.

When Diane was asked if she saw the archive playing a prominent role in preserving cultural information, she said:

*“(I) would definitely. based on the materials available. follow the intuitive patterns that Virginia laid out which always folded culture into the language. and when you look from beginning to end. you do see. That... What she was doing became more complex and more complex otherwise she would get bored right?”*

For the most part, though, culture was not a priority for those who responded to the online questionnaire. When asked how the archive would be the most useful to them, only two respondents commented that it could be a vehicle for teaching culture: *“it can teach students culture”* and *“I can learn more about the Yakama traditions and culture in my local community”*

The rest of the answers to this question will be discussed in section 6.9.

#### 6.6.9.6. *Summary of opinions about content types*

To summarize, everyday language and conversations were the dominant theme for this section of the data. Phonetics, phonology and orthography were the most requested aspects of language with grammar (primarily morphology) being a close second and vocabulary a third. A few of the stakeholders expressed some concern with students having difficulty mastering the orthography. Grammar was seen as necessary but something that should be carefully integrated with appropriate scaffolding while another thought was to teach minimal grammar but provide optional details for teacher (i.e., a teacher’s guide) (§6.9.2.5) as an approach like this would prove less intimidating. Transitives, tense and aspect were given as possible topics to be included, but the most common suggestion was morphology. One respondent suggested teaching students how to peer teach, perhaps by using occupational language.

While there were many comments on domestic and kitchen language, it seemed resources for those domains most likely already exist. Some interest was expressed by adults for materials

teaching the language of more traditional activities, such as hunting. But because of the divided opinions regarding access and a fairly substantial concern with restricting access to culturally sensitive materials, these sorts of materials did not seem appropriate for the online course, though materials related to this may be kept and protected in the online archive. Students and kids, on the other hand, seemed to prefer more general conversation skills. And as such, less culturally sensitive but youth-oriented tasks/domains, such as basketball or horseback riding, may be feasible to include as well.

Again, though, there was little interest in simple, primitive technology like flash cards, which could easily be made in a physical medium. Instead, the participants were interested in incorporating technology, and some had some interesting ideas that showed potential but were not feasible at this point in time. In general, the participants were not very familiar with more common language learning applications and LMSs.

Most participants expressed the need for increased teacher support, and the archive was seen as a good means of achieving this goal. There was interest in making the dictionary more teacher-friendly, perhaps by integrating it into the course. Having a teacher's guide for the course module was also strongly desired. All participants who responded to the topic were very much in favor of collaborating with linguists, though, admittedly, I identified myself as a graduate student in linguistics and that may have had some bearing on the matter. Regardless, each linguist mentioned by participants (e.g., Regan Anderson, Prof. Sharon Hargus, Prof. Joanna Jansen) was spoken of favorably. NILI, in particular, seemed to have a universally positive reputation.

#### 6.6.10. *Broad priorities*

At the end of the questionnaire, participants were asked the more general question:

"How can this online archive be most useful for you and the community?"

Their responses varied but provided some insight into factors discussed earlier, especially factors participants had strong feelings about. For example, two comments were related to access: *"easy access (catch 22 huh?)"* and *"by making it free for people"*. Two other participants had specific ideas about the type of content they wished to see: *"Daily language use to be spoken in home and in community."* and *"reading and hearing the word said"*.

One person took the opportunity to note their class was lacking the equipment necessary to use the archive and class, saying, *"My classroom needs 25 laptops so that my students can access this online class/archive"*.

Others had more general and optimistic comments such as:

- *"understating"*
- *"Revitalizing our language"*
- *"by making sahaplin learning more available"*
- *"it can help the yakama tribe gain its language back we once had"*
- *"HELP LEARN A LANGUAGE"*
- *"Learning a language that soon can be lost if not taught to the next generation"*
- *"More people should/could know this language"*
- *"it can help others speak with elders and feel comfortable"*
- *"having more people fluently speak"*
- *"revitalizing our language"*
- *"Making goals to speak it general, learn it by good memories"*

Two participants had much more extensive comments:

*“This can be useful to help us learn either in social media or taken school credit. Online would be another opportunity for students to learn if and when using online. I suggest it would be a good motivation for community not just students but people as adults to search for about sahapin language.”*

*“Internet has been a wonder for the world because people can have access to information in an instant. Our Native communities are healing and the access to these vital pieces of cultural information would greatly benefit the people in learning more about who they are, where they come from and who their people, their ancestors are. It could be a renaissance for our culture if properly implemented.”*

In the end, there was quite a bit of support for self-paced and remotely accessible content.

- *“So people can learn at their pace and as their time allows.”*
- *“anybody can learn the language”*
- *“It would help very much with families as they have patiently waited for schools to offer this course to school age children”*
- *“As a way for community members to learn the language at their own pace.”*
- *“Assisting those tribal members that can't make community language classes, and those that have strong commitment to learn Ichishkin language. those people of ours are high tech and like using the way of communicating using all kind of technology.”*

Again, the most common theme in this data was access. The questionnaire participants simply saw value in having the content more available. There were a handful of comments regarding the type of content that should be made available (e.g., everyday language) and few

comments regarding how the content was presented (i.e., pedagogy), but the main value seemed to be simply having more content available. Contrary to some of the beliefs and research reviewed in section 4.2.4, there were very few comments in this needs analysis data that could be interpreted as valuing the technological novelty of either option, whether for cultural pride or for other reasons.

#### 6.6.11. *Transcription concordance analysis*

Brown (2001) recommends utilizing transcription concordance analyses (phrasal and lexical) as an additional check when conducting a needs analysis. All transcript data of the interviewers' speech and any utterances that were repetitions of prompts or questions by the respondents were removed. After each concordance was constructed (phrasal and lexical), all words that were used three times or less were removed. Only words that were semantically related to this needs analysis were included (e.g., words like 'little' and 'might' were excluded). After analysis, the phrasal transcript concordance data provided no additional explanatory power or clarity beyond the lexical concordance. The key data from the lexical concordance is provided below in Table 12. Each token is followed by a number showing the number of times that word was used in the transcripts.

Table 13 *Transcription Concordance (Lexical)*

<b>General</b>	<b>Resources</b>	<b>Content Type</b>	<b>Domains and Tasks</b>
Future, 5	Archive, 13	Alphabet, 10	Dinner, 4
Learning, 18	Book, 5	Culture, 5	Domains, 12
Need(s), 47	Computer(s)/Tech/Software, 15	Grammar, 9	House, 5
Opportunity, 5	Dictionary, 19	Prayers, 4	Kitchen, 9
School, 19	Keyboard/Unicode, 12	Songs, 8	
Want(ed)(ing), 56	Materials, 25		
<b>Security</b>	<b>Education</b>	<b>Community and Oversight</b>	
Knowledge, 4	Children/Kids, 27	Access, 33	
Protect/Protected/Protection, 12	Class(es)/Classroom, 44	Committee, 6	
Password, 6	Elder(s), 16	Community, 21	
Reclaiming, 7	Families/Family, 23	Council, 18	
Sacred, 4	Learners/Student(s), 44	Credentialing, 4	
Sensitive, 7	Learn, 24	Enrolled/Enrollment, 10	
	Public, 5	Heritage (University), 28	
	Teach(ers), 58	Linguists, 4	
	Teaching, 32	Members, 16	
		Tribal, 26	
		Virginia(s), 36	
		Yakama/Yakima, 33	

Though this is a very loose analysis as each token is without context or speaker associations, the data does not contradict the other findings of the needs analysis. Both Dr. Beavert and Heritage University were mentioned frequently. ‘Teacher(s),’ ‘Access’ and ‘Dictionary’ (likely referring to Beavert & Hargus (2009)) were some of the more interesting token results. In the end, the transcription analysis functioned sufficiently as an additional check for the primary needs analysis.

## 6.7. DISCUSSION

Perceptions of one's own and others' needs are subjective, so an attempt was made to construct the instrument and conduct an analysis of the data in a way that didn't stifle minority viewpoints but gave proper weight to community stakeholders (Berkowitz, 1996: 33). However, outside of security and political issues, there was considerable common ground shared by the respondents. Below is a copy of the set of research questions with short summaries of the data corresponding to each question.

### **What are the needs of the community?**

#### *What are the situational needs (§6.3.1) of the students?*

The main situational needs of the students included access to current and pedagogically effective technology (Ch. 4), additional trained language teachers and, crucially, educational continuity (§6.7.8). Currently, there is a pronounced gap in access to language education for middle school students. Continuity across academic subjects (i.e., immersive teaching math and science in the language), while not as frequently discussed by the stakeholders, was also seen as a valid need. Immersion classes that focus on more traditional academic subjects would provide more exposure time overall and more domain-specific experiences. However, to do this would require meeting the other needs related to additional resources (§2.2.2.2 & §3.3) and trained teachers (§2.2.2.3) as well as other factors such as financial resources, available physical space and community demand (Ch. 3; Hugo, 2015a).

#### *What are the language needs (§6.3.2) of the students?*

Students need more domains outside of the classroom in which to use the language (§6.7.9.2). Above any other specific domain, conversational skills were prioritized as a need for

students (§3.3). The next most urgent need was access to materials, whether to be utilized in a classroom or for self-paced learning.

*What are the situational needs (§6.3.1) of the teachers?*

Teachers have a need for more materials (§1.3.4.3 & §4.7.2) that are relatively accurate (§4.7.6) or correct language-wise, pedagogically sound (§4.2.3) and easy to integrate into classroom lessons (§6.7.2, §6.7.6, & §6.7.7). In order to take advantage of the desired materials, as well as existing materials such as the online Beavert & Hargus (2009) dictionary, teachers need more technological resources (§6.7.9.3 & §6.7.2) as well as training on how to use them effectively and develop new content for new platforms. The need for training also extends to general language pedagogy and linguistics (§6.7.9.4). Teachers require some knowledge about metalinguistic concepts and jargon in order to fully utilize language resources that target academic linguists and have not been ‘translated’ for the average language learner or instructor like most textbooks for more-commonly taught languages.

*What are the situational needs (§6.3.1) of the community?*

Like students and teachers, the community also has a need for technology and resources. Essentially, in order for the community to fully support language efforts (§6.7.1 & §6.7.2), regardless of whether individuals are classified as teachers or learners, they need resources. The unique situational need for the community, in this instance, is sovereignty. This is both in the sense of sovereignty over language education (i.e., local control (§2.3.1)) as well as an awareness of the role language plays in political sovereignty for an Indigenous nation (§2.3, §5.5, §5.6.4 & §6.2.4). This issue directly relates to the first language need of the community discussed below, which is domain reclamation.

*What are the language needs (§6.3.2) of the community?*

A very important need is domain reclamation (§6.7.9.2, §6.7.10 & §2.3.2), which is the ‘reclaiming’ of a domain that currently mandates the use of English (e.g., grocery shopping, sporting events, etc.) such that Yakama becomes the dominant language in that environment. This is seen as something that is either less feasible in general, or something that will take more time and incremental progress to see happen. The community sees cultural knowledge (§4.7.9.5) transmission as a primary need. In order to do this, though, there is also a need for more accessibility of materials for community members (§6.7.3.5 & §6.7.9.5).

*Post-test / to what degree were the needs met? (perception/opinion)*

The archive and course seemed to address the following needs: Technology, teacher training, educational continuity (minor), access to materials/resources, cultural knowledge transmission (minor).

During the post-development assessment process, a demonstration of the archive was given at another Sahaptin language conference at Heritage University.<sup>143</sup> Ample time was provided for the attendees to ask questions or raise concerns, particularly about security and access issues, but no concerns were raised at that time. All of the attendees were provided a paper with information on the archive and its location and asked to contact me with any questions, concerns or ideas. Throughout the conference I took the time to speak with stakeholders who had been difficult to contact after the previous structured interviews. During these casual unstructured interviews, all comments regarding the archive were positive, but the

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<sup>143</sup> Páwyak’ukt Ichishkíin Sapsikw’aláma (Gathering of Ichishkíin Teachers), August 19, 2015.

active teachers commented that they had not had the time to investigate the archive fully and utilize the resources in their classes over the past year. When asked follow up questions, no comments were made describing confusion or difficulty with the system, only a lack of time, or a possible (inferred) lack of interest. Some of the materials in the archive related directly to topics of need discussed at the conference (e.g., orthography) and when this connection was made during the presentation, it seemed to raise interest in the system. Enlisting students to aid in the transcribing of audio materials as a possible course-based exercise also received a favorable response.<sup>144</sup> However, it seems unlikely that the teaching community at large will take advantage of the archive in the near future without some support for curriculum integration as time is limited.

### **What are the attitudes of the community regarding these projects?**

*What attitudes exist regarding online education?*

Awareness of online language education options are limited (§6.7.7) but favorable as long as they are accessible to most community members. There were concerns about access, though, in regards to certain types of content being either made available to non-Yakama citizens or all content being overly restricted (§6.7.3). Instructors also had an interest in online resources that went beyond remedial (§6.7.9.3) and did not want another alphabet trainer or simple vocabulary flash card system (§4.2.1 & Chapter 7).

*What attitudes exist regarding cooperation with the UW?*

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<sup>144</sup> This idea came from Prof. Sharon Hargus.

Results related to public sentiment (§6.3.2) showed that opinions of the UW are favorable bordering on neutral. UO and Heritage have closer relationships with the local language community, and while opinions of them overall were also favorable, there were a few concerns expressed about Heritage having sole control of the projects (§6.7.3.1 & §6.7.4). The two positive ideas provided regarding the involvement of the UW were that the UW is located in the same state as the bulk of the speaking community and that it is seen as a politically neutral entity (§2.3.1, §6.2.4 & §6.7.3.4).

*Would the community prefer modules that could be integrated easily into existing classes or a standalone online course?*

While most participants saw a need to integrate online resources into the classroom, a standalone format had more support (§6.7.7) as it could provide some access to people who currently have none.

*Pedagogic/Philosophical: Should the course take a focus on meaning or focus on forms approach?*

The data showed a preference for a predominate focus on meaning approach with an emphasis on everyday conversation. Forms should be integrated as well, though, but only to a lesser degree (§6.7.9.1).

### **How does the community think security issues should be handled?**

*How much of the course and archive should be open to the public?*

Barring new guidance from Dr. Beavert or the Yakama Nation, the majority of the data from the needs analysis supported having all content, excluding anything that might be culturally

sensitive, be open. At any point, individual content can be secured or made open.<sup>145</sup> The course will not incorporate culturally sensitive materials and should be fit for open access. However, oversight is welcome and may be required (§2.3.1, §4.4.2, §6.2.4 & §6.2.6).

*Is the password security for individual materials in the archive sufficient?*

Apparently, it seems the existing password security system meets the needs of the communities at this time. Other security options (e.g., using .htaccess to prevent access to the entire site) were discussed with the stakeholders. No participants expressed any clear concern regarding the WordPress password system (§5.5.2 & §5.6.4) or made additional suggestions (§6.7.3).

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<sup>145</sup> I recently attended a talk on Cherokee revitalization (Frey, 2015) where the speaker provided an interesting perspective regarding the idea of non-members learning the language (e.g., non-Yakama learning Sahaptin). If a goal is the reclamation of the majority, if not all, of the domains in the geographical land of the Yakama Nation (whether historical or current), the economics must be taken into account. Economic incentives are arguably one of the more effective motivators for language revitalization. However, as the Yakama Nation is surrounded by English-dominant land, and there is an economic integration between the two communities, economic incentive could extend to the parties that are involved with the Yakama Nation. In other words, if one wants to effectively communicate, relate and negotiate with the Yakama, then it might be advantageous to adapt to their language to some degree. This economic incentive, whether for business or employment, is argued to be a major reason for the shift away from many Indigenous languages in North America to English. This opening up of the language, at a communicative level only—that being non-sensitive cultural information—could provide improved relationships between the in- and out-groups.

Although it's only hypothetical, an alternative situation could be a series of domains that are only Sahaptin-centered when Yakama are present and communicating amongst themselves so that when non-Yakama are present there will still be a means to communicate. For example, we could imagine one of the many gas stations or markets on or around the Yakama Nation, which receive visitors frequently, transitioning to becoming a Sahaptin dominant domain that excludes outside experts such as those mentioned by Bob (e.g., biologists and forestry researchers). A situation like this raises the question of how reclamation like that might affect revitalization by keeping non-members who regularly interact with the community linguistically isolated while simultaneously raising the question of how to balance concerns about security and ownership of the language. Thus, one argument is that economic incentives might translate into economic vitality and power, which could support the ownership and sovereignty of the language in the long run. While I have no authority to do anything about the idea above, and it does not affect the results of the NA, which is guided by the participants, it is relevant to the discussion and future policy affecting the language. It is included in this chapter to provide a broader lens to interpret the results and to provide more 'food for thought'.

*What should the community's involvement in administration and curation of the site and archive look like?*

Currently, the involvement of the community is limited to the stakeholders that responded to the needs analysis. Minimal oversight by an apolitical committee on behalf of the Yakama government was requested by a portion of the respondents (§6.7.3.1). This plan depends on the interest and cooperation of the Yakama government.<sup>146</sup> Otherwise, other forms of collaboration and curation will be encouraged of community members.

While some topics were controversial (e.g., non-Yakama citizens accessing materials) and others uncovered no clear solution (e.g., security administration and political oversight), the needs analysis was overall very successful. The participants provided plenty of information that could be used as a guide for the archive and sample course. Again, it should be stated that the needs analysis did not represent all of the views of the community and opinions may change in the future (§6.2.3, §6.2.4, §6.2.5 & §6.2.6). Instead, the needs analysis is a single set of data reflecting the views of a key group of stakeholders as accurately as possible. In the next section, there will be a summary review of the implications of this needs analysis.

## 6.8. IMPLICATIONS OF THE NEEDS ANALYSIS FOR THE ARCHIVE AND COURSE DESIGN

In this section, the aims and goals (§6.4.1) of the archive and online course module as based on the results of the needs analysis will be clearly defined (Richards, 2001). Again, each aim may consist of multiple objectives. It is important to keep in mind that “objectives are not

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<sup>146</sup> Up until the completion of this dissertation, none of my emails or phone messages to Yakama Nation government officials received any response. All messages contained a summary of the current status of the project, what the next steps were and that any oversight would be welcome.

permanent. They must remain flexible enough to respond to changes in perceptions of students' needs and changes in the types of students served.” (Brown, 2009: 285) Chambers (1980) similarly emphasizes the transience of needs. It is important to keep in mind that the needs uncovered by the needs analysis are shaped by a context of current perceived gains and perceived value, as well as planned future development and planned or possible future goals.

#### 6.8.1. *Hosting institution*

An unresolved issue from the needs analysis is that no one person or group directly affiliated with the Yakama government offered to provide any degree of oversight. As noted in fn. 146, multiple emails were sent and phone calls were made to various people in the Yakama Tribal and General Councils on a monthly basis over approximately a 12 month period, and no one in authority responded with any opinions on the matter. Out of necessity, unless things change, other institutions may be required to act as gatekeepers. There was no statistically significant difference in opinions regarding the three higher educational institutions that could end up as the host of the archive and course, but the University of Oregon was slightly more favored, likely because UO has had a much stronger relationship with Yakama language stakeholders through NILI than UW. Questionnaire respondents expressed overall positive views about Heritage University, but there was a mix of positive and negative comments about the institution acting as a gatekeeper. The negative comments were mostly related to past resources being locked up or lost. Heritage did, however, have strong ties to the materials through the class currently being taught there as well as through Edward and Mary James. Edward and Mary were both students of Dr. Beavert's, and Edward eventually became a Sahaptin instructor at Heritage. Both Mary and Edward collected all of the materials donated to Prof. Hargus at UW for the archiving project this document describes. Dr. Beavert similarly has had a strong relationship

with UW, primarily through her work with Prof. Hargus and wishes the materials to reside there. Only one respondent was strongly opposed to the materials being kept at UW, but no reason was given. In the end, practicality will likely solve this debate. UW and UO are more likely to have the long-term archives in place to handle the materials beyond the temporary online content management system-based (CMS) archive. Currently, UW has the servers and software to host the course, and UO has adopted the Canvas LMS, which is relatively compatible with Moodle (UO Libraries, 2014). Should Heritage or NILI gain access to compatible LMS software, they could also host a copy of the course. The only firm decision to come out of this needs analysis on those grounds, therefore, was that, barring any future contact from the Yakama government, all three institutions should have access to the course and materials, potentially mandating some standards of protection for culturally sensitive materials across all three campuses. As the materials are digital, they can easily be accessed from any location or duplicated and hosted from multiple locations.<sup>147</sup> Other key groups, such as the Yakama Language Program, may not have the resources to support the LMS and CMS but should still have equal privileges for utilizing the resources wherever they are hosted.

Accessibility and collaboration are key to the success of this project and will be discussed further in §6.9.2.5. A positive outcome of this needs analysis was the lack of evidence for any degree of conflict and competition between the institutions in question. Instead, everyone spoke with a great degree of respect for the teachers and researchers working at all three. Though no oversight committee came to fruition through contact with the Yakama government, it is still

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<sup>147</sup> This could add additional burdens to the complicated issue of security administration. Even if there is consistency in the decision making process for which resources should be secured, the labor would be duplicated for each instance of the archive that is available. In other words, additional instances of the archive would only provide more localized control for the opening up of access to resources.

clear that while these institutions may be hosts and managers of the archive and LMS content, local control is an imperative. An argument made by more than one stakeholder was that having an external organization host the content might actually be an advantage as doing so would put the archive on more politically neutral ground where local teachers and activists could bypass political conflicts similar to those that have impeded them in the past (§6.7.3.4). On the other hand, there were a few comments regarding a disconnect between the tribe and universities with hints of past transgressions. Therefore, regardless of participation coming from the Yakama government, there must be a clear and open position towards the government and members of the Nation.

#### 6.8.2. *Development of the LMS-based course*

This section presents the general plans for online course development based on the data from the needs analysis. While not all of the content proposals were possible to implement in the online sample course module, this data should be useful for others as additional development work is conducted in the LMS installation.

##### 6.8.2.1. *Course content*

The following course content modules should be prioritized for development:

- Orthography and basic phonetics
- Morphology
- Everyday language
- Conversations and dialogues
- Vocabulary

Lower priority modules:

- Basic grammar (i.e., visual and conceptual training about basic word order, morphology, or phonology)
- Long form reading (e.g., stories)

There were some comments in favor of cultural support, but a compromise would be to educate learners in the language so they would have the skills to access the culture on their own through other sources which could be better managed within the community. In the end, the needs analysis found that cultural content was not a feasible option for a course being developed and potentially managed by an institution outside of the community (e.g., the UW).

#### 6.8.2.2. *Primary target groups*

Head Start, intermediate students and teachers are the target groups, though hypothetically, some of the content will be of interest to isolated beginning youth and adult learners as well.

#### 6.8.2.3. *Head Start software*

Following the suggestion from Bob regarding developing resources for the local Head Start program, it was necessary to try to get more support data (i.e., for triangulation (§6.2.8)). The contact in the program provided background on the available resources. Currently, the available desktops are old (as Bob described them) and are unable to connect to the internet, but the students do have access to iPads with some degree of internet being available. After the project possibilities were described, the contact expressed an interest in developing an iOS app. Because the children are fairly young it is important to keep the interface simple with large, clear buttons and swiping. We discussed how this might not be feasible for this particular phase of the project and agreed that a web-based ‘app’ (e.g., a LMS) would be fine as long as the interface is

simple, yet engaging enough for the children. The types of content the Head Start program was interested in seeing included simple phonetics, orthography, vocabulary and recordings of elders. Even flashcards were of interest.

Some of the content developed for the primary LMS course module can be repurposed for the Head Start program and used offline (e.g., orthographical and phonetic with speech sound files and attractive imagery accompanying the orthography examples). This route of access may be necessary in the near future as the local Head Start lacks resources. Hot Potatoes<sup>148</sup> and other media heavy (i.e., kid-friendly) solutions can be used. Hot Potatoes also allows direct web deployment using HTML and can be easily accessed on an iPad without a need to interact with the LMS system (i.e., it could be given a shortcut icon on the iPad desktop). If necessary, a more simplified, custom application can be developed using a graphically-based programming suite (e.g., Adobe Flash or Unity), though this latter option is not preferred due to the risk of content lock (§4.2.6).

#### 6.8.2.4. *Student community and interaction*

The question of student interaction is important to address. Some functions to be incorporated into the LMS course structure will be forums and teacher feedback. The feedback will be necessary for certain types of activities (e.g., essay and speech). Comparative feedback (i.e., correct examples provided after submitting an answer) can be included with speech activities, but ideally, a language teacher would need to be willing to moderate and review answers periodically. Alternatively, a system of mentorship could be fostered to provide more robust feedback and a greater sense of community (i.e., teaching peer teaching (§6.7.9)). The

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<sup>148</sup> <https://hotpot.uvic.ca/>

LMS would also allow for the grouping of learners and the ability to complete group work, though this, too, would require some sort of management. In the end, it is unlikely these goals will all be successful. Past attempts at such efforts within the community have been predominantly unsuccessful, and raising community interest in an online course to a degree necessary to make it self-sustaining is a very difficult thing to do. Regardless, it should be attempted. While having community activity to the degree described above is unlikely, this doesn't discount the value of developing the content in the proposed way (modular in the short-term within the context of a longer-term plan). Also, even if promotion of the resources may not result in substantial activity, the more participants and users there are, the better. Perhaps, there will be 4 or 5 people who use the resources actively and may create some degree of community online that would be beneficial to for the development of the resource. Most importantly, it could benefit the vitality of the language as more technically-based domain usage is necessary so that the language can be adapted for future learners who will likely have even stronger ties to digital domains.

#### 6.8.2.5. *Teacher support and collaboration*

As for building community interest and activity, as discussed above, building and supporting teacher collaboration and moderation is a difficult but crucial task for the success of an online course module system like the one described in this document. Two participants in the needs analysis commented on this topic, saying they hoped once the initial course modules were launched more would be developed to fill in the gaps. In an ideal world, over the period of a year or two, it would be possible to develop a basic 101 course that would be offered completely online or in a shorter amount of time as a hybrid-style course. However, the issue here is bigger than the creation of new content and the moderation of student activity that is required; it is also

the improvement of existing content. Most likely there will be errors that need fixing and organizational and presentational elements that need fine tuning.

While it has been stated above multiple times that this is a difficult task, it is not impossible or unfeasible. Over the past two years, prior to the completion of this NA, I've had the opportunity to work with the Lushootseed Language Program of the Tulalip Nation on a collaborative effort to develop online/hybrid materials for their language courses. The Tulalip Lushootseed Language Program has a group of talented, motivated and skilled teachers and administrators who were able to develop a full year sequence (i.e., 101, 102 and 103 classes) of online content with multiple weekly exercises and other materials. After the completion of the first year sequence, work began on a 201 series as well as a stand-alone course targeting community members who wanted a limited introduction to the language through the learning of a local legend (Lady Louse). Currently, the first year content of the program is being reviewed in order to fix errors, add new content and improve existing content.

During the first year, I assisted in integrating the learning content into the Moodle LMS hosted by the UW Language Learning Center. The creativity of the teachers and administrators involved in the project, along with their use of the system over the year, surpassed most of the efforts I have seen to develop online curricula support for other language programs on the UW campus. Over time, my roll diminished to occasional support, though the Language Program continued to expand. Even teachers with no prior experience working with LMSs or similar modern language teaching software were able to learn the ropes relatively quickly. Considering Moodle is one of the most robust (i.e., complicated) LMSs, observation of this program is even more promising. The consistent effort and tremendous organizational skills of the Tulalip

Language Program's teachers and staff is an inspiration.<sup>149</sup> Thanks to their talent and hard work, we now know the proposed style of curricula development and collaboration (§4.4) can work.

The inherent problem with the Sahaptin projects is that after the launch of the sample course module, the Sahaptin community may not have the same degree of access to human support as the Lushootseed community had, depending on the available resources at the UW's LLC. Thankfully, the work on the Lushootseed program provided an opportunity to try out a variety of teacher training methods (e.g., in person, via phone, text, video). While in-person training seemed to be effective, the most promising methods of training were actually example/template duplication and video. In example/template duplication, model content such as a quiz is provided with clear examples so a teacher can duplicate, unhide and edit all of the fields that are specifically marked as needing editing. For example, the description blank for a question might read, "Put the text of the question that the student will see here". Simple, short screen capture videos on how to do basic activities were also effective and much less intimidating than plain documentation. Only a handful of skills are needed to get comfortable with a system like this and then additional documentation, even specifically for language teaching on LMSs, is plentiful all over the web. Even so, this documentation is likely not suitable for all communities, initially. The goals and challenges Indigenous language programs face do differ—the gap being most apparent between more resource-robust, commonly-taught language programs at

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<sup>149</sup> More recently, I have had the privilege to oversee a project of developing an introductory online course for Inuktitut using primarily existing materials, but supplemented by addition media and exercises. The individuals working on the course have created an excellent resource that will continue to be improved, but already serves as another example of how this type of collaborative development can be effective for less-commonly taught languages, especially those situated in regions with a very low population density.

universities and lesser-taught languages like Sahaptin. Thus, a degree of tailor-made teacher training materials are a necessity for any project like this (§7.3.6).<sup>150</sup>

### 6.8.3. *Archive training and collaboration*

Finally, collaboration is a vital issue for the archive (§2.3.1, §4.2.5, §4.4, §6.7.2, §6.7.3, §6.7.5, §6.7.6 & §5.6.3). Beyond moderation of materials that may need to be secured or the addition of new materials to the archive, there are two key needs. First, errors in the materials need to be annotated. Second, certain video and audio materials need transcriptions (§5.6.6), whether by using the simple text entry box on the resource page or by attaching a proper time-aligned transcription file using software similar to *ELAN* (2015; Sloetjes & Wittenburg, 2008). Hypothetically, this could be done by a single individual. While there is value in having a single support coordinator to facilitate collaboration (§4.4.2), there is an enormous amount of existing content in the current archive (Ch. 5) that would require amounts of work beyond the available time most people could contribute. If additional materials are added to the archive, this will only increase the burden. The level of technical, pedagogical and linguistic training varies greatly for the stakeholders in the community and related institutions., and the known individuals with the necessary skills and interests to assist with the project already have so many existing projects worthy of their time, part-time work in the archive or online course system is the only realistic expectation to ask of them. Even for individuals with the necessary skills in the language, linguistics or pedagogy and an understanding on the technology, there is still a need to undergo training on workflow, naming and formatting conventions and specific functionality of the

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<sup>150</sup> Through my collaboration with the Tulalip Language Program (§4.4.4) I observed that tutorials which were tailor-made for their needs were much more likely to be used than existing software or pedagogical tutorials made for a more general educational audience. In fact, they were the only ones that appeared to be effective for their needs due to limited time and substantial apprehension regarding the new technology.

archive. It's possible the permanent archive home will be able to facilitate some of the necessary work (e.g., the metadata) (§5.6.7), but error correction and transcriptions are predicted to be beyond the scope of their resources. Therefore, community and specialist collaboration will continue to be necessary for the improvement of the archive.

## 6.9. CHAPTER SUMMARY

As was discussed in the background (§6.2), this needs analysis deviated in some ways from the standard models due to the special factors affecting many Indigenous language learning contexts. The situation analysis supported many of the arguments made by Jacob (2013) (§6.2.7) regarding the effects of colonization, including trauma and power imbalances. The primary challenges, therefore, related to *politics* with respect to access and establishing oversight and administration, the *adoption* of the new projects (Chapter 5 & Chapter 7) and its continual curation and development as well as the *economics* surrounding it, as access to technology is lacking (§6.3.1).

For more standard educational contexts it may be more reasonable to concentrate the effort of a needs analysis for the purpose of defining a “defensible curriculum” (Brown, 2009) (§6.2.1). However, as the background discussion and data analysis (§6.7) have shown, for Indigenous language contexts, *needs* must often be guided by *wants* (§6.2.2). The scope of the *needs* is great (§6.7.1, §6.7.2 & §6.7.9) (e.g., no standard pedagogical textbook, grammars, curricula with continuity), so the goal isn't so much a fine tuning of instruction or systems to achieve improved outcomes as it may be for other education programs (e.g., school districts, more-commonly taught language programs at a major university). Self-judged and reported student *abilities* (§6.3.2) are very low for the language. In addition, participants and stakeholders

have substantially different training and expertise, so more abstract wants were often communicated instead of shared pedagogical jargon. Unfortunately, for some of the more divisive issues (e.g., access administration (§6.7.3.1) and politics (§6.7.3.4)) participants provided very few *solutions* (§6.3.2) but did provide some pedagogical and resource *priorities* (§6.9). Regardless, the philosophy and framework used for this needs analysis mandates that it is guided by the participants and stakeholders (§6.2.3).

Admittedly, the findings of this needs analysis are complicated and murky in a few places. Certain topics are very controversial, and the authority of the stakeholders is subjective (§6.2.5). It is possible some participants may not be considered as stakeholders by certain community members (§6.2.6). There was a near universal designation of Dr. Beavert as the primary stakeholder, and she, in turn, deputized others as key stakeholders. As I am a community outsider, I needed to take a more conservative stance on issues like open access (§6.7.3).

The *needs* uncovered by this needs analysis will change over time as will the number, quality and type of resources available. Different stakeholders may participate in future NAs, but this data was helpful for guiding the projects described in this dissertation (Ch. 5 & Ch. 7) as well as in informing future projects and supporting future NAs. Ideally, the sample online course module will serve as a foundation for others to contribute to and expand upon, adding to the available resources (§4.4). Future work surrounding this project could be guided to some degree by the *needs* (and included *priorities*) that were uncovered by the needs analysis (§6.8 & §6.9.2).<sup>151</sup>

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<sup>151</sup> I wish to thank the participants for volunteering their time and opinions as they offered more than enough guidance to proceed with the next phases, namely finalizing of the archive (Ch. 5), the content audit and the explicit sample course planning (Ch. 7).

## 7. ONLINE YAKAMA (YAKIMA) LANGUAGE COURSE

The Yakama language community needs analysis (NA) data highlighted the strongest interest in a standalone format for the planned course (§6.7.7).<sup>152</sup> Some participants in the needs analysis were interested in seeing content covering some of the more advanced language skills than most technology-based options (e.g., flashcards) usually offer. That data agrees with the proposal made regarding the importance of recognizing the content (§4.2.2) and pedagogical (§4.2.3) potential of a solution.

In this chapter I report on the development of a sample Sahaptin course module using the archive as a springboard and explain the decisions behind designing the structure of this course. The main goal (§4.2.1) for this project was to develop a few sample modules that could be adapted and expanded upon by community members and specialists (§4.4). Therefore, the developed modules were intended to be suitable for stand-alone use as well as course integration (pseudo-hybrid). They needed to be as self-contained as possible so that future modules could be easily integrated along with them to construct courses (§4.4.3). Also, the content needed to be demonstrative of the core functionality of the LMS that is suited to language pedagogy so that it could be used as a baseline template for future instructor development (§4.2.5).

The sample course module is currently located at:

<http://wefli8.lang.washington.edu/course/view.php?id=640>

The top-level organization of the course is:

- External Resources

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<sup>152</sup> Standalone, as opposed to hybrid or disconnected lessons for class integration.

- For Students
- For Teachers and Content Creators
- About Sahaptin Language Activists and Educators
- Learning the Alphabet
- Everyday Language
- Stories

As will be seen below, the content needed to be integrated with a predominately focus-on-meaning (i.e., implicit input) approach with an emphasis on everyday conversation, but a focus-on-forms (i.e., explicit input) approach is utilized as well to a lesser degree (§6.7.9). When developing the sample course content, I avoided incorporating any content that could be seen as culturally sensitive or needing protection (§6.7.3.3). Section 7.1 begins with a discussion of some of the theoretical and practical concerns that arose before and during the creation of the course. The actual integration structure and final sample course content is presented in section 7.2. Some potential options for further development, based on the needs uncovered for the Yakama language community (§6.7.9 & 6.9.2), are presented in section 7.3. Section 7.4 closes with a summary of the work and initial assessment of the project based on the proposals for technology-based language learning solutions above in section 4.2.

## 7.1. AUDITING EXISTING CONTENT FOR INTEGRATION

The grammatical structure of Sahaptin is arguably quite distinct from the dominant L1 languages of the area (e.g., English & Spanish), with ergativity, clitics, person-based affix variation, etc., encoded in the grammar. The following description of the language is oriented to

an L2 learning context, whereby the majority of the learners are beginners, very few are intermediate, and fluent speakers are very rare.

In the following discussion, linguistic concepts and details that appear to play a role in basic communicative competence (e.g., literacy and syntax) are given primary attention, instead of those with an arguably more minimal role in the competence of beginning learners (e.g., prosody and intonation). The topics of *transitive verbs* and the *orthographic system* were chosen because they were what Sahaptin educators were most interested in (§6.7.9 & §6.8). Section 7.1.1 concerns the complexity involved with Sahaptin transitive constructions and related but inaccurate and contradictory information in the archive. Of interest is how this situation highlights the need for careful pedagogical development with expert collaboration (4.2.5) and some degree of language planning and attitudinal education. Section 7.1.2 provides a brief overview of the Yakama orthographical system and illustrates how even some of the most apparently basic elements of the language can often benefit from a linguistic analysis and pedagogically shaped presentations (§4.2.3).

#### 7.1.1. *Transitivity: accounting for excessive complexity and contradictory content*

Not all content in the archive is easily adaptable to an online lesson format. Some resources require multiple preceding lessons before introducing the topic they cover. As mentioned above, errors (e.g., spelling, grammatical, etc.) were found throughout the materials in the archive. There were also issues with the resources that extended to the occasional omission of important information and an overall disconnect with the actual complexity of certain grammatical points which could be considered vital to making the material more pedagogically sound (§4.2.3). Taking into account the materials in the archive (§5.4.1) that were carefully

audited for integration into the course, this grammatical “complexity” (or distinctiveness from English) is also reflected in a general lack of pedagogical materials covering any grammar except for the most basic structures.

An audit of the resources in the archive related to transitive clauses, as was requested by Yakama community members in the needs analysis (§6.7.9.1), revealed limited consistency in the type of information they contained and the way it was presented. The latter issue is less of a concern, of course, but when comparing the descriptions provided by linguists Jansen (2010), Rude (2009) and Beavert and Hargus (2009) the deficiencies in the content became more apparent. Rude (2009) highlights some of the complexity involved with Sahaptin transitivity. Even the simpler constructions provided in the archive materials would require mastery of multiple concepts absent from English before Sahaptin sentences could be accurately parsed and, most importantly, learners could generate/create their own transitive sentences (i.e., without relying on simple substitutions in memorized formulaic chunks) (§4.2.3.2). Focusing on a single aspect of sentence construction, clitic placement, learners would need to potentially learn/acquire rules (Jansen, 2010; Rigsby and Rude, 1996) relating to phonological weight, syntactic ordering and perhaps variable ordering. This grammatical point alone highlights the need for specialist collaboration in the creation of pedagogical materials (§3.3, §4.2.5, §6.7.2 & §6.7.6).<sup>153</sup>

#### 7.1.1.1. *Difficulties with adapting learning resources for transitive constructions*

In the next few paragraphs, I will review some of what is required to produce basic transitive constructions, specifically focusing on the complexity related to the subject and object prefixes and clitics. The term ‘complexity’, being largely subjective, is used here in the sense of

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<sup>153</sup> Also see Jansen (2010: §10.5.1) for an example of more recent grammar-related learning material development for the language being done through specialist collaboration.

being in contrast to intransitive constructions (§7.2.4), and to some degree English, which is the L1 of most learners.

According to Rude (2009:34), verbs in Sahaptin are “inherently intransitive, mono-transitive, or ditransitive.”<sup>154</sup> There are clitics that depend on the transitivity of the verb for interpretation.<sup>155</sup> Intransitive constructions are fairly regular in comparison to transitives. If a speaker wishes to indicate a first or second person subject in an intransitive construction, then it will always be done with a clitic, while third person subjects generally require prefixes.

Transitive constructions have a series of “complex clitics” (Jansen, 2010) and prefixes that must be memorized. For example, with transitive verbs the complex clitic =*mash* is used to indicate a singular first person subject and a singular second person object. If either the subject or the object, or both, are plural then the form =*matash* is used (Jansen, 2010).<sup>156</sup> The complex clitic that indicates a second person singular subject and a first person object requires an additional affix based on the number of the object. If the first person subject is singular then the inverse marker *pá-* must be added to the verb, as in (2) below.

- (2) Mish nam máytsk̄i pax̄wyaktwíita?  
 Mish=nam máytsk̄i pá-x̄wyák-twíi-ta  
 Q=2Sg morning INV-sweat-APPL-FUT  
 “Are you (Sg) going to sweat with me in the morning?”

<sup>154</sup> A mono-transitive is a verb that is usually described as a ‘transitive’ verb, such that it takes only two arguments (i.e., subject and object). Rude also notes that Sahaptin doesn’t have unaccusative verbs “(such as English *break*)... Thus *tkúma* ‘camp to dig roots’ is intransitive but *x̄ní* ‘dig roots’ is transitive...” (2009:3)

<sup>155</sup> For example, if the verb is not transitive, then =*mash* indicates the genitive case, ‘your’. If it is transitive, then =*mash* is a complex clitic (Jansen, 2010:313). The pronominal prefix on the verb is a good diagnostic for determining the transitivity of a verb (Rude, 2009).

<sup>156</sup> Rude (2009) suggests that the plural form (=matash) only codes the plural for the second person object and the first person subject remains singular.

However, if the number of the first person object is ambiguous, then only the simple subject clitic =*pam* (2pl) is used, as in (3).

- (3) Mish pam máytski xwyaktwíta?  
 Mish=*pam* máytski xwyák-twíi-ta?  
 Q=2Pl morning sweat-APPL-FUT  
 “Are you (Pl) going to sweat with me/us in the morning?”  
 (Jansen, 2010:132)

The inverse marker (*pá-*) may also present another challenge to beginning learners as it shares a strong phonological similarity to the third person plural marker (*pa-*), simply differing in stress marking. Jansen adds that “*pá-* is a stress-stealing prefix, so it will take word level stress if the word does not also have a strong root or stressed suffix.” (133)

There are also complex prefixes for clauses with a third person singular subject and third person object of ambiguous number. The prefix *i-* is used for direct constructions, while *pá-*, again, indicates inverse (135).<sup>157</sup> The prefix *á(w)-* is used to indicate third person objects in transitive constructions with first or second person subjects (133). In third person subject/object inverse constructions,<sup>158</sup> case marking is required on the object but is optional on the subject. (136) For transitive constructions, the prefix *pa-* indicates a third person subject that is dual or plural, as well as a [–animate] third person object with an ambiguous number (138). However, if

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<sup>157</sup> These markers also have some interesting discourse functions, as *i-* can also be anaphoric with the nominative subject of the preceding clause. On the other hand, *pá-* indicates that the direct object of its immediate clause is the referent of the nominative marked entity in the preceding clause (Rude, 2009). Hargus (p.c.) describes as a topical object in those contexts (cf. Rigsby and Rude 1996).

<sup>158</sup> While it is not crucial for beginning sentence production, [+human] does play a role in determining whether a construction is direct or inverse, with –human subjects and +human objects likely occurring in inverse constructions (137).

both the subject and object are [+animate], then in Yakama the clitic =*pat* and the verb prefix *á-* are used.

Table 14 summarizes the subject and object marking forms that are required for learners to construct basic clauses with transitive verbs, using only singular subjects and objects, disregarding animacy. The left column indicates the person of the subject, and the row along the top indicates the person of the object.

*Table 14 Singular subject and object marking clitics and prefixes for transitive constructions (modified from (Jansen, 2010))*

	1 <sup>st</sup> object	2 <sup>nd</sup> object	3 <sup>rd</sup> object
1 <sup>st</sup> subject		<i>0</i> = <i>mash</i>	<i>á(w)-</i> = <i>nash</i>
2 <sup>nd</sup> subject	<i>pá-</i> = <i>nam</i>		<i>á(w)-</i> = <i>nam</i>
3 <sup>rd</sup> subject	<i>i-</i> = <i>nash</i>	<i>i-</i> = <i>nam</i>	<i>i- (DIR)</i> <i>pá- (INV)</i> = <i>0</i>

#### 7.1.1.2. *The challenge of complicated constructions in natural language impoverished environments*

Because the materials in the archive are not sufficient to capture the complexity described above, it was deemed feasible to instead focus on intransitive constructions (§7.2.4) by supplementing materials in the archive with other resources (e.g., Jansen, 2010; Rude, 2009). In order to develop a more approachable curriculum in the future,<sup>159</sup> it may be prudent to develop a simpler base construction for sentences that learners could master until they acquire the other skills necessary to match the forms provided by L1 speakers. In order to do this it would be

<sup>159</sup> Jansen (2010) has done an admirable job making the content in her grammar appropriate for learners, and it is a tremendous resource for the community as is. However, the inherent complexity of transitive constructions for beginning English L1 learners is a separate issue.

helpful to have an understanding of what the most common forms are that exist in the corpora that are available. Which features have more semantic weight and which are less necessary for communicative competence (e.g., [ $\pm$ human] affixes)? What are the most common intransitive, monotransitive and ditransitive structures, and could they be used to improve the scaffolding for learning resources for each type of structure? These questions could possibly be most easily addressed using precision grammars. Precision grammars are computer-based representations of grammars consisting of rules that are intended to account for the grammar of a language. Bender, Goodman, Crowgey, & Xia (2013) present a project which utilizes a statistical parser that illustrates how similar systems could be leveraged to get statistics on the frequency of occurrence of certain syntactic structures in an interlinear glossed corpus.<sup>160</sup> This information could be used as a strong argument for which structure should be considered the base form for learners. For example, Rude (2009) argues that “Sahaptin has a non-configurational syntax inasmuch as, at least in most of its dialects, the semantic agent and patient are never distinguished by word order.” (16) He provides counts<sup>161</sup> for each of the orders: SVO (50), VS0 (36), VOS (34), OVS (16), SOV (9), OSV (4). Rude continues, “Word order, as in any ‘free’ word order language, is not random. It just does not distinguish subject from object; rather, it serves referential and pragmatic functions.” (17) However, going by the examples provided, these referential and pragmatic functions are fairly opaque, and would likely be very difficult for even intermediate learners of Yakama, as they are described by the educators in the Yakama needs analysis (§6.7.8). A second advantage of utilizing computational linguistics research is that the variables could be

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<sup>160</sup> The work by Bender, Ghodke, Baldwin & Dridan (2012) shows how precision grammars could be used to analyze corpora with less interlinear glossing, as well as improve existing interlinear glossing. Such a model could also be used to get statistical counts on grammatical structures occurring in the corpora.

<sup>161</sup> Rude utilized “187 pages of Northwest Sahaptin texts (Jacobs 1929, 1937)” to get these counts.

experimented with until an ideal balance is found between predicted frequency of use, semantic accuracy, correct parsing rates, and the least number of features (e.g., [+human]).<sup>162</sup>

Deciding on a “simplified” form for a language would likely be a politically sensitive issue and all living L1 speakers should be consulted. This supports the value of promoting a sociolinguistic understanding of issues like standardization, language variation (i.e., dialects) and language change (§2.3.2 & §2.3.3). As language use grows in the community, the language will inevitably change as all languages do. Therefore, it is important for there to be a community-wide increase in the awareness of natural language development and variation. The language that was and is being documented will not be the language the next generations speak if revitalization occurs. Some people may view these changes as deviations from a traditional ‘authentic’ language, but it is important to understand that most languages Indigenous to North America were previously rooted in a very different linguistic environment. Currently, most, if not all, communities associated with Indigenous languages are to a variety of degrees surrounded by or part of an English dominant and monolingual culture (§2.3.1). There seems to be very little likelihood of these languages ever being used again in a monolingual community (Romaine, 2006). Furthermore, it is not simply an issue of bilingualism. Because English and other dominant languages are pervasive, there is likely to be some form of language mixing. Language change and purity are important topics that deserve further discussion and can be promoted through a variety of means (Wolfram & Schilling-Estes, 1995), including technology-based learning materials (§4.2.1).

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<sup>162</sup> See Crowgey (2014) for a project that could be modified for such a purpose.

Until more robust curricula and resources are available it could be highly advantageous for newer learners to gain some communicative competence with language students generate themselves (i.e., not memorized chunks). Goodfellow & Alfred (2002) argue that language shift towards English is seemingly inevitable for all North American Indigenous languages, first as pidgins and then creoles. Anecdotally, I have heard from many local Indigenous language educators that their students continue to default to English syntax even after considerable instruction. Perhaps a compromise could be struck through pedagogical maintenance so that the learned simplified grammatical structures are closer to the recorded L1 Sahaptin data than English, allowing an easier transition for advanced learners to the more ‘authentic’ forms later on. Having a simplified form may also provide some distance between a more culturally ‘authentic’ and protected version of the language so that basic language education could be less controversial to certain community members (§2.2.4.3; §6.7.3).

#### 7.1.2. *Orthography: instructor avoidance and simplification rules*

Another topic of interest to many Sahaptin educators was the orthographic system. As was discussed earlier (§6.7.9 & §6.8), many people in the community expressed being overwhelmed by the orthographic system as it is not as thoroughly taught as some educators and community stakeholders would like. Related to the perception of complication educators can have, Dr. Virginia Beavert stated in an interview for the needs analysis that learners “...have to know the alphabet and there’s a lot to teaching the alphabet. You could use a whole year to teach that.” (§6.7.9.1) This section is concerned with how linguistics can be used to simplify seemingly complicated language through pedagogical presentation (§4.2.3), and not necessarily omission or language planning (§7.1.1). While it may not be ideal for all learners, I again argue that explicit

metalinguistic input can play a valuable role, at least for some learners, in language pedagogy (§4.2.3.2).

To begin, the Yakama orthographic system consists of forty-six characters:

' á a áa aa ch ch' h í i íi ii íí k k' kw kw' ḳ ḳ' ḳw ḳw' l ł  
m n p p' s sh t t' ṭ ṭ' ts ts' ú u úu uu w x xw x̣ x̣w y

Thankfully, the orthographical system has patterns that can simplify its apparent complexity, which were incorporated into the sample online course. There are only thirty-nine graphemes in the alphabet, each which have a one-to-one relationship with a phoneme. The accented vowels are simply marked for stress and used for purposes like indexing in a dictionary. Doubled vowels indicate a lengthened or, lengthened and less centralized, vowel. In Sahaptin, vowel length is contrastive for three vowels ([ʌ] [ʌ:], [i] [i:], [u] [u:]). If learners understand that all vowels have a stress marked counterpart, the number of elements they need to memorize is reduced to 39 characters. All stops and affricates have a glottalized counterpart (i.e., ejective). Understanding that glottalization is contrastive in this way results in an inventory of thirty unique characters. Likewise, rounding is only contrastive for velar (<k>, <x>) and uvular consonants (e.g., <ḳ>, <x̣>). Knowing this, the orthographic consists of twenty-six characters, matching the inventory count for the Standard American English alphabet.

While the orthographic system can be made fairly comprehensible for English L1 learners, the pronunciation of the phonological system presents other challenges. The language has a velar/uvular distinction for fricatives and stops, such that monolingual English L1s will only have familiarity with one of those consonants (the velar stop [k]). The voiceless alveolar

lateral fricative [ɬ] could also present a challenge for learners. English has glottal stops, but no ejectives as in Sahaptin. The affricate [tʃ] could be one of the more difficult for English L1s to master.

Other differences may not be as challenging to learners. In a Yakama short/long vowel pair (e.g., [ɪ] paired with [i:]) (Hargus, 2009), the shorter vowel may be centralized enough to allow for a relatively salient distinction in slow, and perhaps exaggerated, speech for beginners. In other words, there are quality differences between the short and long vowels (see Hargus and Beavert (2014) for acoustic data supporting this). C<sup>[w]</sup> does exist in English as a cluster, and is likely less of a concern as other phonemes and clusters for most learners. In the end, most L1 English Sahaptin L2 learners will need to direct their effort in this area primarily towards learning/acquiring four new phonemes [q] [x] [χ] [ɬ], ejectives, and the velar/uvular stop contrast.<sup>163</sup> If nothing else, it seems reasonable that it could help to alleviate the negative affective perception of that aspect of the language for instructors. If instructors are able to focus their education towards these rules and phonemes, and reduce their feeling of being overwhelmed, it should increase the chances the principles of the orthography will be explicitly taught. Additionally, as will be seen in section 7.2.2, a linguistic analysis of this type can greatly improve the pedagogical variety of lessons and activities for students.

### 7.1.3. *Summary*

Above, the brief exploration of transitive constructions illustrated some of the issues that can arise when tackling curricula development for language structures that are arguably more complicated. Although complexity is a debatable and subjective idea in this context, it can be

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<sup>163</sup> This argument is not intended as support for a contrastive analysis style framework for the pedagogy of the course, but in the case of initial phonemic acquisition, it may be appropriate.

useful as a generalization for how many learning points (i.e., variables) a learner would need to acquire to utilize the new structure. Another issue is the number of structures and variables learners would need to have acquired before the new lesson is undertaken.

If we take into account the argument that comprehensible input and output are crucial for second language acquisition to occur (§4.1.3.2), then more complexity means a greater quantity of input and output are needed to master a structure. For example, in a language learning context, such as in the Yakama Nation, where opportunities for authentic language use are scarce, then it is arguable that some variants of the transitive structure will be used more infrequently and thus less likely to be acquired in the short term. Instructors of local Indigenous languages have anecdotally reported to me that many students, even intermediate learners, continue to default to English syntax in casual conversation. Goodfellow & Alfred (2002) predict that Indigenous languages will continue to shift towards English. Also, the language instructors report that students, and even many of themselves, are too concerned about making mistakes that they avoid using more complex forms and generated language as much as possible. Because of these reasons, I argue that there may be value in providing learners with an intermediate form of certain structures that scaffolds them to authentic language which is closer to the authentic language than the English shifted forms many currently use.

The section above on orthography was intended to highlight the need for careful organization of language learning modules that reflect what we know about generalized orders of acquisition and utilize scaffolding and plentiful amounts of input and output opportunities. The alphabet and its associated phonetic system were a concern for some stakeholders in the Yakama community. Some educators noted that due to its perceived complexity, explicit instruction on

the alphabet was avoided. A linguistic analysis of a system, such as the orthographic one described above, can provide a lesson with the more effective means of scaffolding the content and reducing the complexity. At the same time, the metalinguistic information that is being used to help learners parse and organize the information can be leveraged in later lessons (e.g., stress and intonation) and assist in pronunciation accuracy (e.g., tongue placement).

The most blatant need that arose during the auditing and transferring process was that of specialist consultation and collaboration (§4.2.5). Every single resource taken from the archive was carefully checked and corrected by Prof. Sharon Hargus. The details of that process mirrored many of the issues uncovered in the review of the Dakelh content in section 4.3.2, simply being that errors were plentiful. Without the support of a trained linguist for the language, the effectiveness of the content (§4.2.2) would be greatly diminished, and potentially problematic. This illustrated the value of a support coordinator, as proposed in section 4.4.2. A simple throughput of content from the archive to the course, even in the initial stages without collaboration, is not encouraged unless the main developer is an expert linguist in the language or the content has previously been validated. Another advantage of collaboration is that the few trained linguists currently working with endangered languages should expend as little time as possible in the technical footwork so that they can focus on other priorities (e.g., documentation, §4.5).

## 7.2. THE INTEGRATION PROCESS

This section provides an overview of the functionality of the LMS and the content as it was integrated. Section 7.2.1 deals with a top level view of the course layout, focusing on all of the content and functionality directly linked to the main course page. This is in contrast to all of

the following sections, which are concerned with content embedded in lessons and other activities. The topic of 7.2.2 is all of the modules in the course related to orthography. Modules related to ‘everyday language’ are the focus of 7.2.3, which leads into the lessons on grammar in 7.2.4. Section 7.2.5 closes this discussion of the integration process with a review of the modules and content related to culture, reading and listening.

#### 7.2.1. *Core functionality*

The course was developed using the Moodle LMS (§4.4) v.2.51+ and hosted on a server maintained by the University of Washington Language Learning Center. The course content is laid out as a series of links on a course page vertically. At the top of the course is a graphical header for “Intro to Ichishkíin Sínwit” that matches the branding of the archive to improve the transition for users of both systems (§4.2.4). Immediately below that are links to the archive, dictionary (Beavert & Hargus, 2009), and grammar (Jansen, 2010). After the links, the rest of the course is divided into topics, with content and lessons falling within them. The first topic is a section for students, including a brief welcome and FAQ. Next is a section for content creators and teachers, which contains a forum for collaborative discussion and an FAQ. The following topic is a place for biographies and historical information related to Yakama elders and language activists. For the sample course, short biographies were added for Dr. Virginia Beavert as well as Edward and Mary James, who were responsible for the materials donated to the archive (§5.4.1), which in turn became the foundation of the sample course. The majority of the content described above is static and offers little interaction.

### 7.2.2. Orthography

The first language-specific topic in the developed sample course deals with the Yakama alphabet (§7.1.2). This was done both as a way to address the results from the needs analysis (§6.7.9 & §6.8) and simply to provide the necessary skills to utilize a course where feedback for verbal output is limited and currently wholly asynchronous. The module begins with instructions for setting up the keyboard with links to the appropriate languagegeek.com pages. The next activity is a test to confirm that the fonts are properly installed and displaying, along with a question that asks the learner to simply type *Ichishkín Sínwit* using their keyboard. If the learner omits the accents or substitutes an English lower case “i” in place of the barred “í” the system informs them of the error and for the first time instructs them regarding the importance of these marks. This educational emphasis stems largely from the fact that many of the educational materials in the archive (§5.4.1) and learner-completed homework and quizzes.<sup>164</sup> often completely omitted any stress-marking on words.<sup>165</sup> Other materials with some stress-marking that Prof. Sharon Hargus corrected were found to have numerous omissions and errors as well.

For the next activity, learners are instructed to view a thirty-two minute video of Dr. Beavert lecturing about the alphabet.<sup>166</sup> This transitions to a short lesson on memorizing the alphabet, isolated from the phonemes they represent, using some of the rules discussed earlier (§7.1.2). In order to better support their literacy development and utilization of existing resources (e.g., the dictionary), learners are then provided a lesson on alphabetical order by leveraging rules similar to the ones they learned in the memorization module. This lesson includes a few

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<sup>164</sup> Except for instances where either the learner was completely unidentifiable (i.e., no personal information, etc.), completed student materials were omitted from the archive.

<sup>165</sup> In Sahaptin, stress-marking is contrastive.

<sup>166</sup> This video is one of the few that belongs to the archive (§5.4.6). It was digitized from the best VHS source, then the audio and video were restored as much as possible.

drag, drop and arrange questions of increasing difficulty. These questions were developed using Hot Potatoes (Hotpot)<sup>167</sup>, which is one of the earlier (1998) free e-learning software suites and was developed by the University of Victoria. While much of the functionality of the suite has been integrated in the core of most major LMSs, there are still a few advantages to the system. First, the system is highly stable and has a very good reputation among language educators. Second, activities developed in Hotpot can be easily deployed individually through an HTML page, therefore greatly limiting the technical resources and knowledge needed for most online learning platforms. Third, many LMSs, including Moodle, can integrate Hotpot activities into their courses, including gradebook functionality. Traditionally, these activities needed to be integrated individually at the course level<sup>168</sup>, but a more recently developed plug-in for Moodle (Taskchain) allows for multiple activities to be linked into a single activity, greatly improving the utility of Hotpot. Fourth, one of the functions of Hotpot, called JMix, does not appear to be integrated into the core functionality of any LMS nor have a stable free competitor following Learning Tools Interoperability (LTI) standards. JMix allows users to create ‘scrambled’ activities. As an example, an instructor can input a paragraph, sentence or morphologically complex word and then separate the paragraph/sentence/word into chunks that are then randomly scrambled so the student can arrange them. This is one of the most promising tools for immediately interactive online grammatical practice and for helping learners to visualize morphology and syntax in ways that differ from the more common computer-based grammar exercises. The orthography questions for the Yakama language course first ask the learner to arrange the first five letters of the alphabet, which helps them master the ordering of all vowels.

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<sup>167</sup> <http://hotpot.uvic.ca>

<sup>168</sup> This could be an issue with respect to clutter and the organization of the main course page. For example, if there are ten activities each with their own link for a single section things can become cumbersome.

Next, they are provided with an exemplar consonant set to arrange, which covers the velar/uvular, rounded/unrounded, ejective/non-ejective contrasts. At that point, with all of the rules having been presented for review at least once, they are given the entire alphabet to arrange.

The last lesson added to this sample topic is on handwriting. While it is arguably not crucial for modern digital literacy and language use, it was added for two reasons. First, there are limited resources available for the language, and many of the resources are older and not typed, it could be useful for parsing some content they may encounter down the road. A handwritten <t> can be confused with <ɬ>, which is often written more like <ɰ>. Second, there was a suitable set of resources in the archive that could be easily integrated. This includes a scan of a complete handout that was used in the course for this purpose and an audio recording of Dr. Beavert instructing learners on how to complete the activity.

### 7.2.3. “Everyday” language

This module of the course is *everyday language* with a task-based focus on greetings and basic conversations (§4.2.3.2). The participants in the Yakama needs analysis were primarily interested in language suited for domestic domains (§6.7.9.2), but because the course content is introductory, a much narrower domain focus (e.g., kitchen) did not seem appropriate. Also, the materials in the archive (Ch. 5) were more adaptable to a broader conversational theme.

The everyday language topic in the course begins with some foundational vocabulary. The learner is presented with a glossary of the key lexemes for the module.<sup>169</sup> The learners then have the option of playing the equivalent of the game ‘hangman’ or a crossword puzzle with

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<sup>169</sup> Additionally, at the top of the course, a ‘random glossary entry’ is shown to each visitor to the course each time they load the main page, providing some extra exposure.

these lexemes. Because the LMS can utilize the glossary to randomly generate exercises for the learner, they could replay the games quite a few times until it would become too repetitive. Next, there is a short glossary and crossword puzzle dedicated to lexemes for the days of the week.

Following that is a subtopic is on ‘greetings’ vocabulary and phrases. There is a lesson that begins with some basic greetings, followed by a short quiz, another lesson on greetings for visiting someone, another quiz covering the preceding lessons, and a third lesson on farewells. After this lesson, there are a series of activities that scaffold (§4.2.3) the learner through different modalities. It begins with a simple matching quiz for each Yakama phrase and its English translation. Next, they are presented a random selection of English translations for the phrases they have seen and are then asked to type in the Yakama translation.<sup>170</sup> The final activity asks the learner to speak a dialogue (either by themselves or with a partner) into the LMS audio recorder. If they are using the module within a class context, their instructor could provide verbal or written feedback later, otherwise they are instructed to practice and self-assess to their best ability. The subtopic on greetings and conversations closes with two more lessons. One covers more basic conversation content and the other specifically questions, commands and responses to be used in the classroom.

#### 7.2.4. *Explicit metalinguistic input*

The bulk of the explicit metalinguistic information in the course can be found in a grammar module that falls under the topic of everyday language, titled “Introduction to making simple Sahaptin sentences”. This lesson began with materials from the archive, but most of the content was created by myself using Jansen’s grammar (2010) as a primary resource.

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<sup>170</sup> These activities also provide specific feedback if the learner is omitting stress marks and substituting English characters for Yakama specific characters (e.g., <i> in place of barred ï).

The primary learning goals of the module were:

- Students will have an understanding of transitive vs. intransitive verbs in general (i.e., they will be taught this distinction using English examples).
- Students will practice identifying and constructing simple Sahaptin sentences using intransitive verbs.
- Students will learn language that is applicable to everyday conversations and the home.
- Students will have an understanding of affixes and clitics.
- Students will have an understanding of person and tense/aspect.

The intent was that the learners will have already memorized some of the phrases presented early in the topic section, and that they will be able to use what they learn in this module to begin to unpack them. As I argued earlier (§7.1.1), Sahaptin is morphologically complex compared to English, and many learners could benefit from some explicit scaffolding (§4.2.3.2). English is used to help transition the learner to understanding key linguistic terminology and the basic grammar of Sahaptin. The lesson begins with a brief overview of intransitive verbs, starting with some English examples comparing transitives with intransitives. Learners are then presented with a short quiz where they are asked to identify the subject, object and verb of an English sentence. This is followed by a section explaining the key difference between affixes and clitics, and in particular, how they behave in Sahaptin. The rule for clitics is simplified for the benefit of beginning learners (following the arguments made earlier in section 7.1.1 and 7.1.2), but a note is made of this for the learner as well. The following section has another short quiz that asks the learner to apply what they have learned and answer where the affix and clitic should go in a sample Yakama sentence with one noun and an intransitive verb. Afterwards, there is a brief

review of related, but basic, linguistic terminology. Specifically, they are presented with the concepts of person, clusivity<sup>171</sup>, affixes, and pronouns. This information allows the learner to better grasp the rules for clitics and affixes as they are based on person and clusivity, for both intransitive and transitive verbs.

As was illustrated earlier (§7.1.1), many new concepts need to be understood in order to learn how the simplest sentence in Sahaptin is constructed. Therefore, at this point it would seem beneficial to scaffold the learning content by reducing the variation as much as possible. The final page gives the learner a few elements that will be used to ‘build’ a ‘simple’ sentence, which includes a single verb root (*wína-* ‘go’), aspectual suffix (*-sha* imperfective), noun (*táwn* ‘town’), and case suffix (*-kan* ‘to/toward’ or allative). These are used along with the three 1<sup>st</sup> person clitics to demonstrate clusivity, optional pronouns, and the structure of complete sentences. Learners are given a brief explanation of glosses like the following.

### 1. **Ínk nash wínasha táwnkan.**

Ínk=**nash** wína-**sha** táwn-**kan**.

I I go "**-ing**" town **-to**

"I am going to town."

After a few examples that share this basic construction, there is an introduction for a few examples that return to the rules for person and affixes (e.g., ‘a clitic is used if the subject is 1st or 2nd person, while a prefix is used on the verb if the subject is 3rd person’). The lesson closes

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<sup>171</sup> Sahaptin has exclusive and inclusive first person plurals, ‘we but not you’ and ‘we including you’ respectively.

with a statement intended to portray these potentially complicated rules as examples of why Sahaptin is interesting and valuable (§4.2.4).<sup>172</sup>

The accompanying activity on intransitives incorporates more everyday language. It begins with a translation exercise for which the learner is given some sentences in English, each with some blank spaces below them. A series of morphemes needed to complete the translation, along with some distractors, must be clicked and dragged up to the appropriate blank until the full sentence has been translated. This transitions to a writing exercise where students are given some morphemes and a few new verbs and then asked to type their Yakama translations of the English sentences. These questions also provide specific feedback for learners who omit stress markers or include hyphens or dashes to separate the morpheme boundaries, or if they used the wrong morpheme. Finally, the students are given a speaking exercise and asked to create five unique sentences using the language they have learned so far.

#### 7.2.5. *Reading and listening*

The final topic incorporates some culturally-oriented content with more connected and natural speech. Because of concerns about security and access (§6.7.3), the least culturally sensitive but level-appropriate content was selected, which happened to be some materials and recordings related to Halloween. The topic begins with a recording of Dr. Beavert talking about Halloween. The lecture is appropriate for beginners as it is primarily done in English but she teaches some Sahaptin vocabulary and phrases related to the holiday. A second resource was modified to make two separate activities. One is a reading-oriented lesson for new learners

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<sup>172</sup> At any point in the course module where it felt appropriate, the language was described as something fun or interesting to learn. Words that imply learning Sahaptin is difficult were avoided.

which is in Yakama with English translations for each phrase. The second is a short reading passage with no English translation, marked for intermediate learners.

### 7.3. DEVELOPMENT ROADMAP

The sample course module as described above in section 7.2 is intended to serve as an example of a focused, but limited integration of learning content into an LMS following as closely as possible the guidelines laid out in section 4.2. As I argued in section 4.5, documentation (basic research on a language) should take priority over the development of learning resources in most cases. The extensive content in the archive, while not formally documentation, has some value in a similar sense. Therefore, the urgency for preserving and distributing the content destined for the archive was much greater than course development. This is why the course was designed to implement focused, modular, and exemplar lessons and activities that could be leveraged as templates in the future to aid the development of additional resources. In this section I will suggest some priorities for future development work for the course.

#### 7.3.1. *Content for Head Start*

An initial priority would be the development of some activities targeting Head Start students (§6.9.2.3). It's possible, depending on their knowledge level and comfort with computers, that young learners could take immediate advantage of the game modules in the vocabulary section of the everyday language topic (§7.2.3). Admittedly, the user interface (UI) and affective power (§4.2.4) of the course is very limited, especially for very young learners. Some highly graphical modules similar to some of the drag and drop activities developed for the Lushootseed courses (§4.4.4) might be reasonable first steps. However, as much of the integrated

functionality of an LMS (§4.2.7) (e.g., grading (§4.4.3)) is not required for younger learners, other software and frameworks could be integrated in the LMS, such that the LMS simply serves as a centralized delivery platform (something the current instructor of the Head Start program had no concerns about as long as the UI was clean).

### 7.3.2. *Orthography*

Related to orthography, an introduction to stress and basic Yakama phonology would be valuable additions for beginning learners, and an introduction to intonation could fit well in the module for more intermediate learners. The orthography section could also benefit from some activities that engage input and output more heavily for listening and speaking. With some effort down the road, the audio materials from the archive (§5.4.5) and those accompanying the recently-published dictionary (Beavert & Hargus, 2009) could be mined for appropriate speech samples to serve as input. It would also be worthwhile to provide exercises that allow learners to practice discerning and producing the distinctions for the phonemes not found in English.<sup>173</sup>

### 7.3.3. *“Everyday” language*

The everyday language topic needs some authentic dialogues for input that are suited for beginning learners. Picture description tasks could be helpful for the learners who have completed the intransitive construction tasks and learned more directional and location words. Grammatical judgements and error correction exercises might be appropriate for the intransitive construction activities.

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<sup>173</sup> Thank you to Prof. Emily Bender for this suggestion.

#### 7.3.4. *Immersive language*

The LMS software allows for all interface text to be ‘translated’ into the target language, however no language pack for Sahaptin/Yakama yet exists. It could require some neologizing for specific technical terms, such as “backup”, “database” to have a completely immersive environment, but such work supports the goal of domain reclamation (§2.3.2, §6.7.9.2). Because the sample course module was intended to meet the needs of beginning learners initially, the topics and activity names are currently all in English. Ideally, in the short term these could all be translated into Yakama and utilize English in parenthetical translations where necessary.

#### 7.3.5. *Additional morphology content*

While the existing course is a reasonable start to providing learning opportunities related to morphology, future development work is needed for lessons on verbal structure (e.g., Jansen, 2010: 210-216), word classes and basic syntax.<sup>174</sup> A lesson on verbal structure could scaffold learners by starting with a purely graphic representation of a root and affixes, with a system where they can manipulate the objects in order to understand that some affixes can only attach to certain affixes and to certain sides. Gradually, the graphic representation would transition to the orthography matched in color with the shapes and using actual language examples before transitioning to purely black and white text.

#### 7.3.6. *Teacher training*

The basic templating of lessons and activities with simple instructions for teachers was effective in the case of Inuktitut and Lushootseed (§4.4.4), and this course takes a similar path. Additional teacher training content (§6.7.9.4) can be requested by instructors as needed via the

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<sup>174</sup> The phonology/morphology rules for present perfect and habitual case would likely need their own lesson.

contact email. Another reason Moodle was selected as the LMS (§4.4.3) is because it has one of the most active user and support communities in the world. If the instructors are unable to find a quick answer on YouTube or, depending on their expertise, in a help forum, then the UW Language Learning Center should be able to provide support depending on where the course is hosted (§4.4.2 & 6.7.4). Based on received questions and needs, further training videos and lessons can be made.

#### 7.3.7. *Audio*

The 395 audio cassettes that were digitized and added to the archive (§5.4.5) could also be integrated into the course eventually. The majority of the recordings are recordings of Virginia Beavert teaching the class. The quality of the audio is mixed, but generally low enough that some clean-up will be required. Also, the pacing and organization of most recordings would benefit from substantial editing. A few resources, such as the handwritten alphabet recording and handout that were integrated into the course (§7.2.2), have paper materials that accompany the audio. These might be best to prioritize as the least editing would be required to make them appropriate for standalone study. As audio resources in the archive are transcribed (§5.6.6), it will greatly ease the course integration process.

#### 7.4. CHAPTER SUMMARY

In this section, the chapter concludes by assessing the course against the proposals for technology-based learning solutions in chapter 4 as well as the data from the needs analysis (§6.7.7, §6.7.8 & §6.7.9). Specifically, below each of the eight fundamental questions for endangered language learning technology (§4.2) are revisited with respect to the finalized sample online course for the Yakama language.

The first question to be asked when planning and assessing a new technology-based solution for language learning is “What are the Goals?” (§4.2.1). The primary goal was to provide a series of templates that serve as a demonstrative through-path from the archived content to the LMS, which seems to be (tentatively) successful. Many more templates and training modules could be created (§7.3.6), but all of the content types (text, audio, video) are represented in a variety of activities and presentations.

The second question was “what is the content?” (§4.2.2). The answer to this is that the archive is the main source of the content, but other resources (e.g., Beavert & Hargus, 2009; Jansen, 2010) and specialist collaboration (§4.4.3 & §7.1) were required to make it linguistically accurate and more robust. While the goal of the project was to make something to serve as a test-case and template for future development, the content that does exist should have some language learning value. The case-study sample course contains content related to every main content type shown to be of interest by the needs analysis data (§6.9.2.1). There is an introduction to the orthography of Yakama (§7.2.2), vocabulary, conversations and dialogues related to everyday language (§7.2.3), and morphological information in the intransitive lesson and activity (§7.2.4). Beyond the original goals laid out by the needs analysis is the cultural, reading and listening content that was necessitated by the main goal of providing templates for most content and delivery types (§7.2.5). One of the more difficult challenges will be to locate authentic speech samples that can fit the course content in the future. This may necessitate designing lessons around available samples. The creation of new speech samples is a topic addressed later in chapter 8.

The next question, “is the pedagogy sound?” (§4.2.3), is much more difficult to answer. The course, as it is, is incomplete. As a stand-alone learning experience it would likely yield little proficiency gains, but the various lessons and activities could be integrated (hybridized) into a classroom-based course. There is a variety of input and moderated output opportunities for learners, particularly for the orthography (§7.2.2) and “everyday language” (§7.2.3) topics. Based on the conversations with instructors in the needs analysis (§6.7.9), there is a higher abundance of materials with implicit input available to classes currently, so it was decided to add a mix of explicit and implicit input. English is clearly the dominant language of the interface (§7.3.4), which is a deficit for the pedagogy. The greatest weaknesses of the current course are arguably the limited opportunities for output and authentic communication. While learners could collaborate through the system with voice, white boards, and forums (§6.9.2.4), it is highly unlikely that any such activity would happen without first having more robust content and community/classroom support and integration. Eventually, it would be advantageous to integrate some rapid and authentically generated prompts/assessment, but this is not feasible with the current functionality of LMSs. The course uses, to a limited degree, a predicted ideal order of acquisition by introducing orthography before transitioning into implicit vocabulary and chunked phrasal learning, and then onto basic grammar. Also, the greetings lesson eased the learner in with a minimal set of simple phrases and slowly added more complicated phrases, while providing comprehension checks along the way. Although feedback is limited for most self-paced learning technology solutions, an effort was made to provide detailed feedback for all short answer questions that would relate back to previous lessons. For example, after completing a short answer question, the learner can get immediate feedback which would check for missing diacritics (e.g., underscores, strikethroughs, accents) or hyphens indicating morpheme

boundaries that should have been omitted. Finally, the speaking output opportunities are best moderated by an instructor, but if one is not available, learners are instructed to work with a partner or self-moderate. Some of the effectiveness of the pedagogy is dependent upon the functionality of the LMS, but some of it is tied to the organization and presentation, as with any language learning content. Deciding what pedagogy is most appropriate for the Yakama community and what grammatical ‘planning’ compromises must be made (§7.1.1) will require plenty of careful deliberation and discussion.

The fourth question asks, “are affective benefits the most important goal?” (§4.2.4). They were not the most important in this case. In fact, the emphasis of the sample course is on providing local educators with the understanding and tools to start working with the system. Clearly affective benefits can be important, and some attempts were made at improving the aesthetics of the system and reducing the potential for a raised affective filter due to perceived difficulty. However, once more content has been integrated and polished, the positive affective potential of the system should increase.

Question five asks “is there support for cross-discipline and cross-field collaboration?” (§4.2.5). Akin to what I learned from the Inuktitut and Lushootseed projects (§4.4.4), which used the same LMS and similar coordination, there is strong support for collaboration. However, actual collaboration via the LMS itself was limited as the bulk of the collaboration occurred external to the system before integration (§7.2).

Similar to question five, question six, which asks “is the content transferable?” (§4.2.6), is answerable with a “yes” based on the selection of Moodle as the LMS. As a reminder, the

LMS will allow exporting and migration of the content to nearly every other standard LMS and some content can be transferred to paper materials.

Question seven is interested in assessment capabilities (§4.2.7). While Moodle does allow assessment of performance in quizzes and time spent in activities, more learner focused (i.e., ZPD monitoring (§4.2.3)) functionality was not integrated at launch of the initial course, largely due to a lack of activities which could be integrated.

The final question asks “what are the costs?” (§4.2.8). The answer for the system cost is identical to the proposed model (§4.4), but there does appear to be some deployment costs for the community as resources needed to access the online course are much more scarce than estimated initially (§6.7.2). Also, as predicted, the labor and time costs are considerable, but it did force difficult decisions regarding the prioritization of the archive (§7.3).

Summarizing, for the few months that were available to be dedicated to it, the sample course did a reasonably good job addressing the fundamental questions given in section 4.2. There are many potential directions the next stages of development can go (§7.3), but it is important that content be developed in a modular way within the context of a *long-term, well-conceived project* (§4.1) so that redundancies, overlap, and pedagogical (§4.2.3) or content (§4.2.2) imbalances are avoided. In the next part of the dissertation, the focus turns to some of the issues that remain regarding the two case study projects and possible directions for future research.

## PART THREE: FUTURE RESEARCH AND PERSISTENT ISSUES

### 8. CONCLUSION

While the initial phases of the creation of the archive have drawn to a close, there is an immense amount of work remaining to improve the content and metadata. Many textual materials need to be tagged with appropriate metadata (§5.6.8) and to be transcribed (§5.6.6), audio files need detailed transcripts and identification (§5.4.5), errors in all materials need to be noted and corrected, etc. It's potentially a lifetime or more's worth of work, requiring a variety of skills. However, taking into account the urgency of the situation facing Indigenous languages (§2.1) and the limited resources available to most communities and supporting institutions (§2.2.2, §3.3 & §6.7.2), individual parts of a project like this must be triaged. The effort it would take a native speaker to supply voice samples for the online course module would be better spent on language documentation, as documentation materials can be re-engineered for pedagogical purposes, but not vice versa in most cases.

This chapter begins with a brief discussion of some issues from the archive and sample course projects that need further exploration. Then, some related future research projects are introduced before the chapter and dissertation closes with a summary.

#### 8.1. PERSISTENT ISSUES

##### 8.1.1. *Archiving, practicality and room for compromise*

The issue of triaging and practicality relates to a question for those interested in archiving Indigenous content. How good is good enough? From this project I have learned that demands for perfect archival quality need to be tempered by feasibility. Perfection must be considered

along with realistic time frames and the flexibility to account for the needs of different communities (§6.7). Some non-Yakama, but Sahaptin language community members (e.g., Warm Springs) that I met<sup>175</sup> described their efforts to archive materials in their community and the challenges they were facing. Topics such as offsite backups and formats came up, but the individuals involved with archiving expressed a fear that they weren't operating correctly. Many described confusion and being overwhelmed by standards and the processes. Even if an outgroup member such as me could assist within the local context, their efforts to improve things could be severely hampered because of the limited resources available. Two individuals expressed that even the involvement of an outgroup member as a consultant for archiving efforts could potentially be a concern for the community. As was the case with some of the individuals I spoke with (including those participating in the needs analysis who were not citizens of the Yakama Nation (§6.7.3)), the local context is important because they did not want the materials held by an external institution (e.g., UW, Heritage University, etc.). While grants are occasionally available for projects like this, they are usually competitive and temporary. Is a less-than-optimal archiving system, one that is locally controlled, better than none at all? Perhaps there is a risk that the option for compromise could provide a justification for those who would simply rather take the easy route and not invest the time in developing archiving standards-based protocols.

The debate can swing the other way. During the review process for Hugo (2015b)<sup>176</sup>, an anonymous reviewer strongly criticized the file format of the archiving process (§5.4.4.1 &

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<sup>175</sup> These meetings took place at the 2014 and 2015 Páwyak'ukt Ichishkíin Sapsikw'aláma (Gathering of Ichishkíin Teachers), held at Heritage University on August 19, 2015.

<sup>176</sup> The article was submitted to a journal other than the University of Washington Working Papers in Linguistics, which is the version cited here for reference.

§5.4.5.1) and sorting decisions (§5.4.3) for the paper materials. The reviewer argued that the paper materials should have been scanned at a full uncompressed archival format, such as TIFF, even though the source documents were rough, digitally printed and copied text. In a world with unlimited resources, TIFF would be ideal, but in the real world the gains would be minute and the expense increase exponential. As an example, a single page document from this archive (selected at random), when converted to TIFF from a mildly lossy PDF increased the file size by 34,782%.<sup>177</sup> Memory continues to become less expensive, but this could be a substantial difference depending on the number of resources. At the very least it would negatively affect the speed of transferring and cost of online storage and backups. Second, there is a difference in the functionality of the formats. PDFs can natively contain multiple pages. Standard TIFFs<sup>178</sup> would require an additional indexing system for page numbers, which, while not an impediment, would make storage and organizing more cumbersome. Finally, scanners that support output to raw (e.g., TIFF) can take much longer than the scanners used that output to packaged PDFs. All of the high speed and multipage scanners available to me as a graduate student at the largest university in the state were essentially limited to PDF output.<sup>179</sup> To be clear, TIFFs were used in the archive for certain resources that contained information necessitating higher quality (e.g., original prints, images and photos). For those TIFFs, I used my personal flatbed scanner and it took between 10-15 times longer to scan a single page in that format. With the additional work

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<sup>177</sup> Around 5,000 pages worth of paper materials are in the final archive, totaling 355MB, which would be over 120gb as TIFFs. This number does not include counts for paper materials that were scanned for side purposes, or scanned and then discarded.

<sup>178</sup> Assuming they are not layered TIFFs or multipage TIFFs, due to potential standards and compatibility issues. Neither of those options have a fraction of the support PDFs have, and the required expertise to work with them is considerable, especially for communities with limited technical resources and skills.

<sup>179</sup> One scanner did have a raw export option, but the cache and network would not support it. After two sequential page scans the network connection to the scanner would freeze. A single page scan could take up to an hour to be accessible on the network, only after which it was safe to start the next page scan.

for indexing and labelling, if I were have to scanned the print content of the archive into uncompressed TIFFs it would have taken a considerably longer period to complete the scanning process. This could mean lengthening that phase of the project by up to a year because of the quantity of the paper materials. In other words, I may not have finished the archive before going beyond the time limit allotted graduate students at the University of Washington. Considering all of the other important work going on, especially related to documentation, and the lack of response from professional librarians and archivists.<sup>180</sup> regarding these materials, it is debatable if the digitization to TIFF process would ever be completed in the foreseeable future. This is a legitimate concern because of the lack of access community members would have to the materials in the meantime, and also because the materials are on ephemeral formats. While the risk for a quality decrease or loss of information is greatest for the audio and video cassettes, a small portion of the paper materials had already faded, had mold, or had water damage by the time the UW received them.

Therefore, I argue that an extremely strict philosophical view of ‘standards’ is problematic for endangered language communities when it comes to the archiving of these types of language materials. Strict standards are good and vital for many projects, but certain situations require flexibility and compromise. Again, this perspective on standards does not apply to documentation, and as I have argued, pedagogical content should be developed for long term deployment in incremental steps (§4.4). When it comes to archives like the one described in this dissertation, if it’s a question of something potentially never being preserved or being preserved with a slight loss of detail, but not information, then other options need to be considered. If the

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<sup>180</sup> This lack of response likely stems from a lack of time and resources, as they too, must triage projects. This statement should not imply that they place a low value on the materials or that they are lazy.

language community members I spoke with who were interested and involved in archiving are representative, then resources, training and motivation all vary greatly. As an example, the best scanner available at Heritage University that was used for scanning the photos of Edward and Mary James was incredibly poor, with many digital artifacts and low resolution, especially in comparison to even a heavily compressed PDF on a scanner used for this archive.<sup>181</sup> The owner of the photos, understandably, did not feel comfortable with them being transported to the UW where they could be scanned in at a higher resolution. Also, there was no time to transport a better scanner in the time frame when there would be access to these photos. It was then or, most likely, not for a long while, if ever.

Motivation is another concern, as some individuals I spoke with were overwhelmed by the technology and strict standards which are often embedded in technical, obfuscating language. For most communities facing similar challenges like those in the Yakama language community, compromises may have to be made and support networks must be flexible to some degree. There exist opinions within Indigenous communities that they are often promised products from academia that never arrive or take far longer than promised (e.g., §6.7.2). Many of these issues may be resolved by improved communication between academics and the communities.

Outside of formats, there are debates regarding the platforms that should be used. Unfortunately, there do not yet exist any ‘one-size-fits-all-situations’ solutions for either archiving (§4.5; §5.6.2), learning management (§4.4) and ‘static’ content distribution (§5.6.3). Just as some products designed to be out-of-the-box archiving software for Indigenous communities (e.g., Murkutu), while excellent for their specific domains, did not meet the

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<sup>181</sup> Examples of some of the better quality scans, after I did extensive clean up in Adobe Photoshop, can be seen on the biography page for Edward and Mary James in the online course (§7.2.1).

functionality needs of this project, the CMS system described in this dissertation (§5.6) may not be appropriate as-is, or at all, for all other communities. Similar to the arguments made earlier about technology-based learning solutions, when supporting Indigenous digital archiving efforts for language content we need to balance the necessary goals (§4.2.1) and the preferable goals, with the costs (§4.2.8).

Along with the decisions relating to the standards protocol and choice of a core system/platform, a major factor in the success of a solution is human resources. The costs of technological resources for the project described were minimal, thanks to the availability of leverageable resources at UW, but the need for ongoing management, curation and promotion of the archive and course is substantial. It seems evident that one of the reasons the Tulalip Lushootseed online course development has been so successful (§4.4.4) is because of the abundance of talented and motivated individuals at Tulalip available to collaborate on the project. An added benefit is that the Tulalip language program is able to provide access controls and oversight (§5.5.2 & §6.7.3) for the content themselves. Unfortunately, as of yet there has been no real resolution to the question of who should provide oversight for the Yakama language materials archive and course (§6.7.3.1 & §6.7.3.4). While the community nearly universally nominated Dr. Beavert as the primary oversight, she clearly expressed that she does not have any extra time to dedicate to it. The most likely local controller for the content will be Heritage University and/or the University of Washington Language Learning Center, but the individuals who will be responsible for curation, management and promotion have not yet been identified. It is hoped that the long-term/permanent archive will be able to handle these areas to some degree, but based on preliminary conversations and research, I predict that the resources available to those institutions will be limited as well.

### 8.1.2. *Promotion and limited interest*

Technology when used for language learning and language archiving may be less expensive in some ways than traditional methods, but it is by no means without costs (§4.2.8) and risks (§4.2.6). The development of the Yakama learning materials archive (Ch. 5) and sample course module (Ch. 7) took considerable labor from multiple individuals. Thankfully, the majority of the technological resources could be utilized with minimal additional financial costs. In the end, as a case study, the project was moderately successful. Much was learned (§6.10 & §7.4) and content has been digitally preserved for future generations. Unfortunately, the systems have received little use by the Yakama language community. Interest in the project was varied, but generally limited. As described earlier (§6.2.4 & §6.6), attempts to communicate with community leaders and politicians were largely unsuccessful, although I was able to inform various individuals via occasional email and voice messages of the project and its progress. Participants in the needs analysis generally held very strong perspectives on certain issues (e.g., security (§6.7.3)) initially, but nearly all attempts to follow up went unanswered. None of the anonymous responses to the needs analysis questionnaire suggested any negative feelings about the projects.<sup>182</sup> One year after the launch, and after regular updates and emails to stakeholders and educators, I finally had the opportunity to meet some of them face to face.<sup>183</sup> At that time, I learned that the majority of them had never accessed the archive after our initial meetings or used it in class. To be clear, they had explored the archive to varying degrees during each of the needs analysis phases (§6.4), but not afterwards. I provided those I met the opportunity to explore the updated archive. None of the participants demonstrated any difficulty navigating the system. I

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<sup>182</sup> When spoken with in person, no one criticized the project, but they also all knew that I was someone who had spent time working on it.

<sup>183</sup> Páwyak'ukt Ichishkíin Sapsikw'álama (Gathering of Ichishkíin Teachers), held at Heritage University on August 19<sup>th</sup>, of 2015.

inquired as to why interest in the project seemed so low. The general consensus was that it resulted from a mixture of a lack of time, a lack of technological resources in the classroom, and emails getting lost (or people making a habit of not answering the phone from an unknown/less known source). After a presentation on the archive at the same event the educators seemed to have a positive reaction to it and a few people visited the archive in the following few weeks. This seems to suggest a need to factor in some budgeting of additional time and financial resources for substantial promotion of similar projects where use is a more important immediate priority than preservation.

### 8.1.3. *Limited resources*

A crucial difference between the more actively used Tulalip Lushootseed language project (§4.4.4) and the Yakama language project is, again, a lack of resources. Tulalip has classrooms equipped with technology and the majority of their students have more than adequate computers and internet connections at home. All of these are lacking in the Yakama context (§6.7.2). Tulalip has many robust pedagogical materials already available, including a series of Lushootseed textbooks (i.e., readers) (Hess, 1995). While there is ongoing collaboration between Yakama language educators and the University of Oregon on pedagogical material development, the overall availability of complete, sequenced materials is quite different for Sahaptin than Lushootseed. After talking further with Yakama stakeholders and language educators it seems that the consensus is that the educators are overwhelmed with having to develop resources that fit their classes specifically. Since they do not have a standard, orderly textbook to guide the course, they are constantly having to adapt, revise and create content. The materials in the archive may be too advanced, too narrow, too difficult to adapt, or they may feel it's simply too much work to look through an archive for content at this point. Alternatively, it could just be a

matter of habit and culture. Perhaps, once all of the content has been added to the online archive, fully indexed and transcribed, it will be much more useful to Yakama educators. Additionally, more direct collaborative work with individual educators on integrating the content into the course would be ideal. The online sample course module stands a better chance of being utilized as it targets explicitly mentioned needs (i.e., orthography §6.7.9.6) and can be more easily used to supplement course plans.

## 8.2. FUTURE RESEARCH

### 8.2.1. *Perceived links between language & culture*

*“A language is not just words. I mean, it’s a culture, a tradition. A unification of community. A whole history that creates what a community is. It’s all embodied in a language. The language is central to it. So it’s really the revival of a culture and a way of life and its central component.”*

- Noam Chomsky, speaking about the revitalization of the Wampanoag language.  
(Baird, et al., 2010)

The relationship between language and culture, both actual and perceived, has been a topic of interest to linguists and anthropologists for many years. When it comes to Indigenous languages the perspectives regarding the topic are diverse and strongly held. Even non-Indigenous linguists share this disagreement as is illustrated by the quote from Chomsky above in contrast to the McWhorter quote earlier in this dissertation (§2.3.2), who implied that there was a nearly complete disconnect between culture and language for Indigenous people. This relationship was raised in the survey of educators in Washington state, where many of the

respondents noted that teaching culture was the primary goal of their language course (§3.2). Also, some of the participants in the study on out-group attitudes regarding Indigenous languages (Hugo, 2015a) believed that one of the few benefits of teaching the language was a connection to the culture and the access it could provide.

These types of beliefs that hold an especially strong connection, if not equivalence, between language and culture can hinder language vitality and educational efforts. Evidence can also be found in the literature that many educators and activists hold a stronger interpretation of a link between language and culture, resulting in a decrease in the amount of linguistic input in favor of cultural input (§4.2). Other beliefs about the cultural aspect of language prompted defensive and protectionist stances on the teaching of the language and creation of resources, something that was particularly evident in the Yakama language community needs analysis (§6.7.3) that was conducted to guide the projects described in this dissertation. The surrounding vagueness, complexity and general disagreement regarding related issues was a commonly encountered impediment not only for this case study, but seems to be a more prevalent issue in the field. Therefore, a future project will explore how perceptions surrounding the relationship between language and culture with respect to Indigenous languages of North America might influence the efforts to revitalize them. Also of interest is to examine how other researchers have wrestled with the idea and whether there might be a better way to communicate and understand the issue to improve communication between Indigenous language community members and academics, especially linguists and anthropologists. It seems necessary that we develop better ways to illustrate the proven need for linguistic content for projects seeking to support language revitalization, while respecting more potentially sensitive cultural aspects of Indigenous languages that communities may perceive in a variety of ways. The culture and languages of

most Indigenous groups are under threat from the majority culture and languages. This situation is critical for most languages and as such it is important that policy makers and activists in those communities are able to make the most effective educational plan to meet their goals. This will require a closer examination of how both culture and language relate with regards to Indigenous language cultural and linguistic revitalization efforts.

### 8.2.2. *Archived resources, errors and collaborative curation*

While the archive and course involved some collaboration in the development and curation process, most of the work involved myself acting as a coordinator (§4.4.2) with a single primary linguist specialist in the language (Prof. Sharon Hargus<sup>184</sup>). There is still much to learn about how to handle multiple contributors to a similar development or curation project, for scenarios with and without a coordinator. For example, issues related to version control, project mapping, and keeping a centralized course updated when multiple copies of it are in use all deserve attention.

### 8.2.3. *Out-group access issues and attitudes*

From the data in the Yakama language NA, determining who should have access to certain content, whether in the course or archive, proved to be a considerable challenge (§6.7.3.2). The most dominant view was for open access to language education by out-group members, as long as there is no culturally sensitive content (§8.2.1). Yet, there were some who believed that no out-group individuals should have access to language materials or classes. When discussing a hypothetical scenario of only allowing in-group members access to the language, one of the stakeholders involved with needs analysis (Bob) raised the question of how can

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<sup>184</sup> Prof. Hargus also had a supervisory role as my academic advisor.

someone be determined and verified as an in-group member (§6.7.3.3). Should ‘in-group’ refer to any person with North American Indigenous ancestry, or only citizens of a specific Indigenous nation? Do they need to be a citizen of a Sahaptin speaking nation, or must they be Yakama citizens? The vetting of individuals, whether by enrollment cards or other means, and providing individual access rights are not simple tasks. Would a simplified language that also omits elements that are deemed as culturally-sensitive by an oversight committee be a suitable compromise (§7.1.1)?<sup>185</sup> All of these questions will likely require some political involvement, and local politics is something that the majority of Indigenous participants in the needs analysis viewed as having a problematic relationship with language revitalization efforts (§6.7.3.4). It might be beneficial to conduct an in-depth study on these issues and general language attitudes with respect to Yakama. The data from such a study could be helpful to the community and political leaders interested in these issues.

### 8.3. SUMMARY

This dissertation has confirmed some of the positive aspects of technology for language learning. Distribution and preservation are clear benefits. While collaboration via these tools has great potential there are still issues that have not been fully addressed (§8.2.2). Connected to this is the value of incremental and modular development (§4.4.3), which seems like an effective way to address a lack of resources (§3.3 & §6.7.2) while limiting, or hopefully preventing, contact

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<sup>185</sup> I raise the idea here for the sake of discussion and to highlight the current issue of highly restricted language access, limited language resources and classes, as well as viable language domains. While it may be a possible temporary solution for some situations, there are legitimate risks associated with the creation and dissemination of a simplified language form. After discussing the idea with some Indigenous language activists and linguists, it is clear that it is a very controversial idea. A concern is that a simplified form could replace the full language or hinder the likelihood of full revitalization. However, I hope that the idea can serve as a thought experiment to help clarify goals with respect to domain expansion, speaker access, increased speaker population and learning resource development.

lock (§4.2.6). In the case study, it was possible to review incremental development occurring in the archive (via corrections and annotations (§5.6.6)), and then examine the process of even further development of a resource as it was integrated into the online course module (§7.2).

In the end, why is this important? There is limited time (§2.1) to preserve and revitalize these languages. The vitality of a language can have, at the very least, a perceived effect on cultural vitality (§3.2, §6.7.9.5 & §8.2.1). While it seems highly unlikely that any Indigenous language in Washington state will have a stable L1 population at any point in the near future (§2.1 & §4.2.3), there are benefits of partial fluency or even stronger fluency in a simplified pidgin (§7.1.1). Even if the pedagogical potential of the content is limited currently, as science progresses, resource development and preservation may be leveraged in improved ways for future learners. Additionally, the materials may be helpful to linguists in the near and far future. We may also be able to learn from the unique pedagogical contexts of Indigenous language education, especially with integrated technology. While I argued in section 4.2.4 that affective benefits should not be the only goal for technology dedicated to language learning, affective benefits can also be important. Well-developed technological resources can sit alongside grammars (e.g., Jansen, 2010) and dictionaries (e.g., Beavert and Hargus, 2009) to provide a boost to the status of a language (§2.2.1).

In addition to some of the more ‘objective’ arguments supporting revitalization and preservation efforts that were provided above, there is a social justice perspective that should also be considered. North American Indigenous languages were eradicated by government policy (Adams, 1995; McCarty, 1998; Reyhner, 1992; Reyhner, 1993), and a byproduct of many atrocities stemming from colonization. As Jacob (2013) argues, colonialism is not a past event, it

is an ongoing process. Language revitalization is only one part of the process of decolonization. In some instances, it is vital to political power, especially as it relates to sovereignty. In the U.S., language can play a role in determining federal recognition of an Indigenous group as an independent nation (Administrative Committee of the Federal Registrar, 2001).

Non-Indigenous institutions in the U.S. have benefitted from colonization, and this includes academia. As just one example, the public academic institution where I will file this dissertation resides on Duwamish land. It was not until 2015 that the first building on campus dedicated to Indigenous academia (wəłəbʔaltxʷ ‘Intellectual House’) was completed.<sup>186</sup> This was a project that took over forty years of work until construction began (University of Washington, 2013). Also, the UW has not offered a class in Indigenous language for many years. In no way am I suggesting that the few Indigenous scholars and non-Indigenous scholars at the UW who are working to support Indigenous language vitality are to blame in any way. Instead, I am arguing that this is evidence of a larger cultural and political problem. If the largest university in the state of Washington, one that posits itself as a socially and politically progressive institution (University of Washington, 2015), has shown this lack of investment (politically and financially) to the concerns of neighboring Indigenous nations, then there is little cause for optimism.

This long-term disregard by administrators in academia is further evidence for the problem of top-down control and support (§2.3.1). The projects described in this dissertation

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<sup>186</sup> The building serves “to provide a multi-service learning and gathering space for Native American students, faculty and staff, and others of various cultures and communities to come together in a supporting and welcoming educational environment to share their knowledge and their cultures with one another.” (University of Washington Capital Planning and Development, 2015) Also, a “primary purpose of wəłəbʔaltxʷ – Intellectual House is to increase Native American students’ success at UW by preparing them for leadership roles in their tribal communities and the region. While the UW has made promising gains in recruiting Native American students, retention and graduation rates for Native American students fall short of those of other student groups, both at UW and at colleges across the country.” (University of Washington Diversity at the UW, 2015)

(Ch. 5 & Ch. 7) are centered on the principle of local control. However, the projects leveraged resources available to students and staff at the UW (e.g., servers, hardware, etc.) at no cost to us beyond the usual fees (e.g., the Student Technology Fee). The cost to the university for the server space for the Lushootseed courses, as well as the Yakama archive and course is miniscule. Yet, partway through the collaboration process with the Tulalip language program I was asked, while a graduate student, to be involved with some efforts to ‘raise funds’ from the Tulalip Nation to ‘support’ a development project. I had inferred that the goal of this meeting was to raise financial support for offering, through the university, an Indigenous language course or a course to train Indigenous language educators. Unfortunately, the end results suggested that the focus was more on fund raising in general, than a real intention to find support for language education. The main takeaway from those meetings was that some individuals at the UW suggested that Tulalip could pay for its own server and hosting. This idea was raised with the intention that if Lushootseed courses were once more offered at UW, then the courseware developed on those servers could be used for those classes. Individuals, on behalf of this academic institution, thought it was justified to request money from a local Indigenous nation to pay for something (i.e., the hosting) that, in the grand scheme of things, cost them next to nothing since it leveraged only a tiny fraction of *existing excess* space on *existing* hardware with *existing excess* bandwidth. In addition, this suggestion was made with an understanding the resources would also likely be used to teach Lushootseed courses at UW. In other words, the Tulalip Nation was asked to foot the bill for the hardware and the development costs of the instructional resources for a dialect of a language that was spoken by the nation (Duwamish) on whose land the UW now resides. At this time, those fund raising efforts have not been successful. It is troubling to see the university boast about their efforts to promote and support Indigenous diversity, such as the Intellectual House, when so

much of the burden rests on the backs, and in the wallets, of local Indigenous nations. While in section 4.3.1 I argued for similar resource sharing with Indigenous and academic institutions, the above anecdote illustrates why local control of the content is necessary and why making sure, at any point in time, the community who did the development can export a copy of their content (§4.2.6).

Thankfully, there are individuals and smaller organizations on the UW campus who are supportive of local language revitalization. The faculty of American Indian Studies is working hard in a variety of areas, including efforts to have Lushootseed taught on campus again. There are scholars in many other departments doing great work related to Indigenous issues as well. The staff and director of the Language Learning Center have been universally supportive of the projects in this dissertation and others related to endangered languages, welcoming any local Indigenous community to utilize the LMS servers. In Linguistics many of the faculty and many graduate students are working hard to document and assist local and endangered languages. The work of these individuals highlights the value of strengthening ties between local nations and the University of Washington, in contrast to the problematic promotional and fund raising efforts undertaken by the university at an institutional level. The key differences which I have observed that have helped to make the individual connections successful are communication, transparency and follow through. Academics and the university should provide opportunities for open communication with the local communities about their needs. Academics and the university should be as transparent as possible regarding motivations, resources and estimations with respect to research and other endeavors. Academics and the university should strive to complete projects in a reasonable timeframe and provide deliverables to the community as appropriate.

In sum, I have tried to show through these case studies that it is feasible for Indigenous communities, through collaboration, to develop pedagogically effective, linguistically sound, locally controlled, low cost technological resources over the short and long term. One take-away that I would like to emphasize again is the need for development of language materials to occur in the context of a long-term modular project. These languages do not need ten lessons on cooking vocabulary. They need comprehensive curricula, which is something that will require careful planning, patience, and substantial collaboration. Earlier, transitive constructions provided an excellent example of how much previous learning content is needed to transition a beginning learner to a point where they can begin to utilize the complicated constructions (§7.1.1). That content must be carefully constructed so that it can be integrated into a coherent module and, in some cases, be utilized to support other modules as well (e.g., a section on morphology).

It is my hope that collaborative projects like the archive and sample course described in this dissertation can serve as another tool for improving the relationship between academia and Indigenous nations, so that they will have equal access to pedagogical and linguistic expertise, as well as technology. Hopefully, these projects can also support the efforts to decolonize and promote Indigenous sovereignty, through linguistic and cultural vitality.

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## APPENDICES

### APPENDIX A: NEEDS ANALYSIS QUESTIONNAIRE RECRUITMENT (EMAIL)

Hello,

Your opinions are sought for a University of Washington research study for a dissertation project on the creation of an online Yakama language course and learning material archive.

You can help by completing a short online questionnaire.

The questionnaire is estimated to take 5-15 minutes.  
Your participation in the questionnaire is completely voluntary.  
If you choose to participate you may stop at any point.

You will not be asked to give your name and any personal identifying information will not be published or shared.

The survey can be accessed here: <https://catalyst.uw.edu/webq/survey/rlhugo/256536>

Thank you very much for your time and help.

If you have any questions, please contact the researcher:

-Russell Hugo  
rlhugo@u.washington.edu  
Ph.D. Student  
Department of Linguistics  
The University of Washington  
\*Please note that we cannot guarantee the confidentiality of information sent via e-mail.

### APPENDIX B: QUESTIONNAIRE RECRUITMENT (FLYER)

Yakama Community Opinions Wanted

Are you interested in the Yakama Language or Education?

Your opinions are sought for a University of Washington research study for a dissertation project on the creation of an online Yakama language course and learning material archive.

You can help by completing a short online questionnaire.

The questionnaire is estimated to take 5-15 minutes.  
Your participation in the questionnaire is completely voluntary.

If you choose to participate you may stop at any point.

You will not be asked to give your name and any personal identifying information will not be published or shared.

The survey can be accessed here: <https://catalyst.uw.edu/webq/survey/rlhugo/256536>

Thank you very much for your time and help.

If you have any questions, please contact the researcher:

-Russell Hugo  
rlhugo@u.washington.edu

Ph.D. Student

Department of Linguistics

The University of Washington

\*Please note that we cannot guarantee the confidentiality of information sent via e-mail.

#### APPENDIX C: QUESTIONS REGARDING THE RESPONDENT AND THE STATUS OF THE LANGUAGE

- What got you involved in Sahaptin language education?
- How important is Sahaptin language education to you?
- Who should the majority of efforts target (e.g., kids, parents, elders, non-Yakama)?
  - What are the language needs of the target population?
  - What are the situational needs of the target population?
- In a few sentences, could you please give your opinions on current efforts related to Sahaptin language education?
  - What's going on?
  - How well is it working?
- What are the greatest strengths of current Sahaptin educational efforts?
- What are the greatest challenges facing Sahaptin educational efforts?

#### **Questions regarding the creation of the language materials archive:**

- How can this online archive be most useful to you and the community?
- What kinds of content should be restricted in the archive?
- Who should be responsible for deciding what should be restricted and who should have access?
- Do you have any opinions regarding UW being involved in this project?
- Is there anything else you would like to say? Or, do you have any questions for me?
- Should the materials with mistakes be corrected? Who should do it? Will it be harmful to leave errors in?

**Questions regarding the creation of an online Yakama language course:**

- What kinds of content should the Yakama language course contain or not contain?
  - Focus on forms or focus on meaning?
  - Culture vs. language?
  - Specific modules (e.g., orthography, morphology, competencies.<sup>187</sup> or tasks, etc.)
  - Language vs. non-language goals (e.g., affective, political)
- How should the sample Yakama language course that will be started with the materials from the archive be structured (e.g., self-paced, tied to classroom instruction (hybrid), or containing certain types of exercises)?
  - Do you have any opinions regarding online education (e.g., practicality of or issues concerning access to the internet)?

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<sup>187</sup> “Competencies refer to observable behaviors that are necessary for the successful completion of real-world activities.” (Richards, 2001: 129)

- Who should the course be designed for (e.g., a general audience, kids, parents, elders, non-Yakama)?
- What kinds of restrictions should be placed on the content in the course?
  - Should non-Yakama people have access to the course?
- Who should be responsible for deciding what should be restricted?
- Do you have any opinions regarding UW being involved in this project?

## VITA

I received both my M.A. and Ph.D. in Linguistics from the University of Washington, and my M.A. thesis also focused on Indigenous language education. My B.A. was earned at Western Washington University with a major in Linguistics, and minors in TESOL and Latin. In addition to the topics related to Indigenous languages covered in this dissertation, I am also interested in formulaic language and general computer assisted language learning.