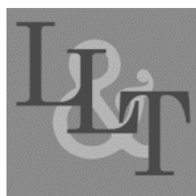
Language Learning & Technology
ISSN 1094-3501
June 2018, Volume 22, Issue 2
pp. 116–132

ARTICLE



Qualitative research in less commonly taught and endangered language CALL

Monica Ward, Dublin City University

Abstract

The use of computing technologies in less commonly taught language (LCTL) and endangered language (EL) learning is different from mainstream computer-assisted language learning (CALL), where several languages, most noticeably English, dominate the literature. Many most commonly taught language (MCTL) learners learn a language for a variety of reasons including potential benefit to their career or because it is compulsory in school. In the case of LCTLs and ELs, there may be different motivating factors including cultural, heritage, and language preservation reasons (Dörnyei & Schmidt, 2001). As the motivation and learning goals of LCTL and EL leaners are often different to those of MCTL learners, it is reasonable to use different evaluation approaches. This paper looks at the role of qualitative research for Finnish, Runyakitara, Ojibwe, and Ndj bbana and reflects on how it can be useful for understanding CALL outcomes for other LCTLs and ELs.

Keywords: *Minority Languages, Indigenous Languages, Language Maintenance, Computer-Assisted Language Learning*

Language(s) Learned in this Study: *Finnish, Runyakitara, Ojibwe, Ndj bbana*

APA Citation: Ward, M. (2018). Qualitative research in less commonly taught and endangered language CALL. *Language Learning & Technology*, *22*(2), 116–132. https://doi.org/10125/44639

Introduction

This paper looks at the role of qualitative research in computer-assisted language learning (CALL) for Less Commonly Taught Languages (LCTLs) and Endangered Languages (ELs). Often Most Commonly Taught Language (MCTL) students (e.g., English language learners) study a language for career or economic reasons, while students of LCTLs and ELs may have other motivations. However, it is an oversimplification to associate MCTLs mainly with extrinsic motivation and LCTLs with intrinsic motivation. Learners may want to learn a language for cultural or heritage reasons (Hornberger & Wang, 2008) and this is true for all languages, not just LCTLs and ELs. Qualitative approaches can provide interesting and informative insights in LCTL and EL CALL contexts, particularly as there are many unknowns, including what types of resources are suitable when there are a small number of learners, where the written form of the language is relatively new, or when educators are unsure what learners would find culturally appropriate. The teaching of LCTLs and ELs may occur in different contexts and learning environments than that of MCTLs. Thus, the type of research carried out should take these different motivations (Dörnyei & Schmidt, 2001) and contexts into consideration and use the most suitable approaches in each case.

This paper provides a brief overview of the role of qualitative research for Finnish, Ranyakitara, Ojibwe, and Ndj bbana. A focus on understanding the learner experience is critical in CALL (Levy, 2015) and particularly in LCTL and EL contexts, as less is known about such contexts. Qualitative methods are more suitable for gauging the learner experience (Heigham & Croker, 2009). In EL contexts, there are several different aims bundled together under a technology umbrella including CALL, language documentation, and language revitalisation (Ward & van Genabith, 2003; Ward, 2004), and the numbers of learners may be very low and eclectic. In this multi-purpose and diverse learner context, a qualitative approach is more feasible and suitable than a quantitative one as the learning aims may include cultural, as well as linguistic

Copyright © 2018 Monica Ward

learning gains, and such an approach may feel less intrusive for learners.

Background

There are various terms used in the literature with regard to MCTLs, LCTLs, ELs, heritage languages (HLs), and minority languages (MLs). There may be an overlap between some of these terms in certain contexts, but they each have their own specific meaning. LCTL and EL CALL literature is sparse, and this is not surprising given the smaller number of learners of these languages.

Terminology

The term *MCTL* refers to those languages most taught and studied (in a particular part of the world). *LCTLs* refers to languages that are less frequently studied in a particular part of the world. *HL* is a broad term and can include immigrant, indigenous, and colonial languages, as well as a broad range of perspectives. *MLs* are languages where the proportion of speakers relative to the population is in the minority. LCTL CALL covers those languages that have limited CALL resources available to learners. HLs and MLs may be LCTLs, but this is not always the case. A language like Spanish in the US, which is a HL for many, is a MCTL with a variety of CALL resources available to students.

ELs, as the term suggests, are languages that are in danger of disappearing. While acknowledging sometimes major differences between LCTLs and ELs (e.g., documentation level, number of [literate] speakers and teachers, economic and socio-cultural contexts), they share several features in CALL terms, including limited or no pedagogical strategies for teaching the language, smaller numbers of learners, a lack of CALL teaching resources, and perhaps a greater focus on intrinsic, rather than extrinsic motivation. The learning environment may be more informal for example, at weekend schools or in community settings. The focus of this paper is on the useful insights qualitative research can provide in LCTL and EL CALL contexts. The Appendix provides an overview of these terms for clarification purposes.

Literature on LCTL and EL CALL

ML and EL CALL are challenging areas of CALL research (Levy, Hubbard, Stockwell, & Colpaert, 2015), but they continue to be an area of minority interest in the CALL field, with English and other MCTLs dominating the CALL literature (Sauro, 2016). There have been some articles on LCTLs in major CALL journals in recent years, but these are few in number, particularly for indigenous and ELs (e.g., Galla, 2016). The two *Language Learning & Technology* special issues on CALL for LCTLs are probably the most informative sources of information on the topic: the special issue on technology and indigenous languages (Ostler & Reyhner, 2002) and the special issue on LCTLs (Thompson, 2013). These collections report on a range of languages from different parts of the world (Europe: Edwards, Pemberton, Knight, & Monaghan, 2002; North America: Haag & Coston, 2002; Australia: Auld, 2002; and Asia: Chen et al., 2013), and provide good insights into the difficulties of developing suitable CALL resources in LCTL and EL contexts.

There are other academic disciplines that look at the themes of MLs, Els, and indigenous education with a specific focus on CALL. In *The Cambridge handbook of endangered languages* by Austin and Sallabank (2011), only one subsection out of 23 chapters discusses the role of information technology for MLs and ELs. Holton (2011) states that language maintenance projects should evaluate their goals carefully before undertaking a CALL project and recommends a holistic approach. Jones (2014) looks at new technologies in the EL context. Topics include CALL for ELs and the use of a learning management system for the Xinkan language family (Hugo, 2014), nascent E-learning resources for J'èrriais (Scott Warren & Jennings, 2014), and new technologies for Frisian (De Graaf, van der Meer, & Jongbloed-Faber, 2014). However, their work is little-known in the CALL world.

Language revitalisation involves trying to revive a language that is in danger of dying out (or that has already died out), as well as aiming to halt or stop language death. It is a complex topic and involves linguistic, political, social, and cultural components. There are additional challenges for CALL researchers working with ELs, including limited financial resources, technical knowledge, technical support, project

management skills, and pedagogical skills. There are often time constraints, a lack of informants, possibly no writing system, limited if any language documentation, and social constraints (Ward & van Genabith, 2003). The multifaceted landscape in which EL CALL operates complicates the evaluation process. Qualitative tools can help capture information that may not be as easy to ascertain with quantitative tools. Community expectations around language revitalisation is a complex area, with Dauenhauer and Dauenhauer (1998) highlighting the difference between the publicly stated goals of language preservation and the unstated, but deeply-felt, emotions contributing to abandonment. Nevins (2004) reports on the problems that can arise when two different understandings of language revitalisation approaches collide. Hinton (2001) lists some CALL-related steps in language revitalisation including language documentation and developing a second language learning program for adults and children.

LCTL and EL CALL

The differences between the MCTL CALL and LCTL and EL CALL influence the quantitative and qualitative research undertaken in LCTL and EL CALL contexts. There are additional research challenges to be overcome and they impact why and how research takes place in these contexts.

Research Questions in LCTL and EL CALL Contexts

There are several research questions that are important to ask in LCTL and EL contexts with regard to CALL. Is the CALL resource useful for learners (Katushemererwe & Nerbonne, 2015)? Does it increase motivation (Lehtonen & Tuomainen, 2003)? Is it usable by the target learner group (Hermes & King, 2013)? While these questions are common in MCTL CALL, they are particularly important in LCTL and EL contexts. Often, a CALL resource may be one of the first its kind for a particular language, and the researchers may be unsure if the developed resource will be useful for all learners (Kyppö, 2014). It is not sufficient to provide learners with information on the grammar and vocabulary of a language with no thought to pedagogical issues, such as what should be taught first and how to teach it (Hinton & Hale, 2001). LCTL and EL CALL researchers can build on previous MCTL CALL research and adapt it to their own contexts. In EL contexts, CALL development teams may have limited or no access to a literate, native speaker, (online) dictionaries, or grammar resources. Furthermore, there is limited time available to develop the resources due to the endangered nature of the languages. LCTL and EL CALL learners may have a slightly different profile than mainstream CALL learners (e.g., slightly older or more self-motivated), so CALL researchers cannot assume that what works for an English as a foreign language student in a formal setting will automatically work as well for an EL learner in an informal setting. For many LCTLs and ELs there is no prior research on how to teach the language in different contexts (formal, informal, or home settings) or what cultural and pedagogical approach is best suited to the language, the learners, and the community. Auld (2002) investigates the use of talking books in Njd bbana for children in a rural community in Australia, where the intended mode of usage was in a communal setting outside at night in the dark, while Hermes and King (2013) look at how CALL might be used between family members in the home setting.

Motivation is a key component in language learning (Stockwell, 2013; Ushioda, 2013). It is complex and continually evolving (Dörnyei & Ushioda, 2013; Gardner, 1985). It is important to nurture students' underlying personal motivations (Ushioda, 2013). Norton and Toohey (2011) provide interesting insights into the language learning in the migrant context, which is slightly different than that of traditional language learners. CALL evaluation should include analysis of learner motivation (Bodnar, Cucchiarini, Strik, & van Hout, 2016). People study MLs and ELs for many reasons (Dörnyei, & Schmidt, 2001) including social identity reasons (Ochs, 1993) and heritage identity reasons related to race, language, religion, and ethnicity (Syed, 2001). In the case of ELs, and depending on the state of the language, additional sources of motivation may include language revitalisation goals, language learning materials development, or language documentation before last remaining speakers die (Hinton & Hale, 2001). Fostering learners' motivation is particularly important in LCTL and EL contexts, as students face many extra challenges in learning a LCTL or EL (Ward, 2016), and these invite a qualitative as well as a quantitative approach to

CALL evaluation.

Quantitative Research in LCTL and EL CALL Contexts

CALL evaluation has mainly focused on effectiveness (e.g., Bodnar et al., 2016), efficiency, and innovation (Chapelle & Voss, 2016). There can be a perception that quantitative research is more robust, and there is an increasing emphasis being placed on it in the field of education (Denzin, 2009). In LCTL and EL contexts, it is sometimes difficult to meet quantitative evaluation conditions due to limited numbers of learners and the informal learning settings which are prevalent in such contexts.

Due to the multi-disciplinary and multi-faceted nature of the LCTL and EL fields, there are limited quantitative research studies reported for LCTLs and ELs in the CALL literature. Vlugter, Knott, McDonald, and Hall (2009) describe a dialogue-based CALL system for the Māori language and report on the quantitative evaluation results, with no information on qualitative evaluation. Uibo, Reuter, and Iva (2017) describe the Võro Oahpa system which is a set of language learning programs for Võro. The team re-uses existing resources to develop Võro Oahpa and report that from a natural language processing (NLP) point of view, the work to date has been successful. However, there is little information about how the resource worked from a CALL point of view or concerning the learners' perception of the system.

In LCTL, ML, and EL contexts, there are often extra explicit or implicit CALL goals, such as cultural and political ones, that complicate the evaluation process (Haag & Coston, 2002). Learners may study the language for cultural solidarity or intrinsic reasons. While this is difficult to measure with quantitative tools, Noels (2005) has used quantitative tools to measure intrinsic motivators successfully. In EL contexts, there is also the issue of administrative and political effectiveness (e.g., Is it usable by learners? Does the CALL system get built?), which in some contexts may outweigh the language learning (pedagogical) goals of a CALL system. In many EL CALL contexts, the focus is on encouraging the learner to use the materials and to make them feel comfortable with the learning experience, rather than measuring their performance. It is important that students have control over the learning process and that it not be driven by the (CALL) resource developer who often does not have knowledge of the EL to add into the resource (Haag & Coston, 2002). In some situations, it may be inappropriate or uncomfortable for students to fill out even anonymous questionnaires as due to low numbers, respondents could be easily identified—obviously making evaluation difficult.

Qualitative Research in LCTL and EL CALL Contexts

Qualitative research usually involves subjective, rather than numerical, data and attends to particular features of the contexts being investigated (Rossman & Rallis, 2003). Subjective evaluation tools such as surveys, interviews, and reflective journals, where appropriate, are useful for investigating learners' perceptions. Qualitative research aims to understand the learner (Stickler & Hampel, 2015) and this is required in LCTL and EL settings, as the learners may be slightly different from MCTL learners. In qualitative research, the focus is on understanding the process of what happens in a particular setting; whereas in quantitative research the emphasis is on measuring outcomes (Heigham & Croker, 2009). In many LCTL and EL contexts, the focus is on developing resources, and not necessarily on measuring the effectiveness, usefulness, efficiency, or other related aspects of CALL evaluation and thus a qualitative approach may be more appropriate. In EL CALL contexts, researchers have limited resources and are often in a race against time (Galla, 2016) and may prioritise the creation of resources over their evaluation.

Research Challenges in LCTL and EL CALL Contexts

There are additional research challenges in LCTL and EL CALL contexts including the lack of access to resources, the limited number of (or no) qualified teachers available to teach the language, issues related to the writing system and standardisation, and different motivational profiles of learners. It is important to clarify that LCTL and EL CALL situations are not exactly comparable. Some, but not all, LCTLs are well-documented, have a language standard, have pedagogically trained teachers, and have available pedagogical materials for the language. Many ELs do not have these features and resources, making EL CALL more

complex and challenging than LCTL CALL. While acknowledging their differences, it is their commonalities in CALL research contexts that are the focus here.

Resource Issues

The lack of access to language resources (Godwin-Jones, 2013; Villa, 2002) including resources for vocabulary, grammar, phonetics, semantics, and pragmatics is one of the main problems for LCTL and EL students. There are few, if any, MOOCs, chatrooms, online fora, or telecollaboration opportunities. There are several reasons for this, including technological (Grenoble & Whaley, 2006), cultural and economic (Galla, 2016), and anticipated lifespan and impact issues (Hugo, 2014).

Teaching Issues

There are several extra teaching related issues in LCTL and EL CALL contexts including the lack of qualified teachers, the absence of communities of practice for the teachers, limited teaching resources, and limited job security (LeLoup & Ponterio, 1998). In LCTL contexts, there may one language teacher with no community of practice or a limited number of students interested in studying the language (Furman, Goldberg, & Lusin, 2010; Godwin-Jones, 2013). Teachers may have to develop new textbooks if none are available (Lasimbang, Miller, & Otigil, 1992). In EL contexts, the teachers may not be native speakers or have near-native-like ability in the language (Wilson & Kamanā, 2001). They may have to be taught how to teach the language (Hinton, 2001). Alternatively, they may be native speakers, but they may not be pedagogically trained. They may be elders or parents who speak the language and teach using older or different pedagogical approaches. Godwin-Jones (2013) reports that his Chinese language teachers used a very traditional approach when teaching him that involved a lot of repetition. This experience is quite common, especially where the teacher has limited or no personal experience learning another language. In some contexts (e.g., North America), there may be requirements for teachers to have some level of pedagogical training or certification, limiting the number of available teachers. Sometimes, the only officially qualified teachers may be speakers who moved to towns and cities, rather than members still living in the community, causing tensions between those who stayed behind to keep the language alive and those that benefit economically from it. Correctness may also be an issue. Bussell, a learner of Hupa (a Native American language of northern California), reported that each native speaker had their own "correct" version of the language and said that other speakers were (Hinton & Hale, 2001)—a phenomenon that occurs in many EL contexts. Some LCTL and EL online resources are developed by language enthusiasts, and it may be hard to check the correctness of such materials (Ward, 2002). It should be noted that EL CALL can take place outside traditional classroom settings as it may be culturally appropriate and less intimidating for learners.

Language Issues

LCTL and EL learners may face additional challenges when learning the language, including issues related to the writing system, standardization, and linguistic meta-language. There may be difficulties with learning to write the script by hand and on the computer, as some specialised software may be required. Fortunately, it has become easier to write documents in non-Latin scripts with the most modern word processers, particularly as Unicode has become more widely available. Robin (2013) discusses the issue of non-Roman scripts on different computing platforms, while Patterson (2014) reports on keyboard issues for Me'phaa, a language spoken in Mexico. For languages with recently developed writing systems, there may be several different writing systems in use, developed by linguists and researchers influenced by different traditions. In the case of Nawat, an EL in El Salvador, Lemus (1997) proposed a writing system influenced by English, while King (2004) proposed a system influenced by Spanish. These might appear to be trivial differences, but they can be quite confusing for learners. There are also issues to consider when deciding how to write glottal stops, clicks, and other linguistic features that are not commonly used in MCTLs. For LCTL and EL learners, there are sometimes fraught political decisions to be made when choosing which system to use. There are over 3,000 languages with no writing system (Simons & Fennig, 2017), and while not impossible, developing CALL resources for these languages would be very challenging—there would have to be a

strong focus on the audio components and culturally appropriate visual components.

Standardisation and dialect issues can be problematic. For poorly documented or undocumented languages, it may be difficult to know what dialect should be chosen to represent the language as a whole. This can be fraught with social and linguistic difficulties, especially if the CALL researchers do not have sufficient expertise to make such a judgement. There may also be issues with linguistic terms and concepts. In English and other European languages, there are familiar linguistic terms to explain and understand the structure of the language. Well known parts of speech such as verbs, nouns, and adjectives are familiar to learners of these languages. However, Arabic has different linguistic traditions and there are different terms used to describe Arabic grammar (Nielsen & Carlsen, 2003). The meta-language used to describe other languages can hinder ML and EL learners. Ndj bbana has no meta-language for grammar and this has implications when trying to teach the language (Auld, 2002).

Learner Profiles

Learners of LCTLs and ELs may have different profiles than MCTL learners. Some LCTL and EL learners are young children whose parents want them to learn the language, perhaps by attending weekend schools (Charitonos, Charalampidi, & Scanlon, 2016). However, LCTL and EL learners are often slightly older (Brown, 2009) and may make a conscious decision as adults to learn the language—not because they have to, but because they want to learn it. For many EL learners, the motivation may be connected with social and heritage identity (Ochs, 1993; Syed, 2001) and may be more intrinsic rather than extrinsic. They may want to make a contribution to preserving the language. The act of learning the language may be very symbolic and learners may not really expect to become fluent speakers. ML and EL learners tend to be less computer-savvy and less used to online language learning (Winke, Goertler, & Amuzie, 2010).

Qualitative Research Examples in LCTL and EL CALL

Qualitative research can provide insights into important aspects of CALL in LCTL and EL contexts. The vast majority of the over 6,000 languages spoken in the world are MLs or ELs (Moseley, 2010), yet there is relatively little published research on qualitative aspects of CALL for these languages. Four different examples of CALL in LCTL and EL contexts are provided here with languages from four different continents: Europe (Finnish), Africa (Runyakitara), America (Ojibwe), and Australia (Ndj bbana). These languages represent a range of languages in terms of endangerment (not endangered to very endangered), learner profile (young learners to adults and novices to re-learners) and learning context (formal to informal). Virtually Finnish (Lehtonen & Tuomainen, 2003) focuses on Finnish, a well-documented and standardised language that is not endangered, but that has a small number of learners in formal university contexts. RU_CALL (Katushemererwe & Nerbonne, 2015), for Runyakitara, uses NLP to develop CALL resources to addresses the needs of *semi-speakers*, or re-learners. The Ojibwemodaa CALL resource for Ojibwe, a threatened language (Hermes & King, 2013), is for urban learners in an informal, home context. CALL Assisted Ndj bbana (Auld, 2002) is designed for learners of all ages in an informal setting for a highly endangered language.

Virtually Finnish

Lehtonen and Tuomainen (2003) report on the Virtually Finnish project, a computer supported collaborative learning (CSCL) virtual Finnish learning community among second-year Finnish language students in US universities. Lehtonen and Tuomainen state that there are very few students studying Finnish in the US and the Virtually Finnish project enabled 19 students in different parts of the country to learn together (the class sizes in each university ranged from one to five students). CSCL was chosen, as its main goal was to help learners share and distribute their learning. It was useful when learners did not have the opportunity to interact with other learners and potentially useful for the students in North America who were separated by long distances and did not have the chance to have face-to-face meetings with other students. The researchers wanted to know the students' attitudes toward the course and the Virtually Finnish project. They used a qualitative approach to get feedback from the students. The participants ($N = 7$) were asked to fill

out simple, open-ended questions at the end of the course. At the time of the reported research, the researchers were unsure if the approach would work from a student's point of view, and a qualitative approach was useful in this regard. The survey asked the students their opinion on how the Virtually Finnish resource impacted their learning, their writing skills, and their reading comprehension abilities. The students reported that they enjoyed using Virtually Finnish and found it motivating (one of the original goals of the project). They reported that their writing skills improved, but only one student reported improvements in reading comprehension. Lehtonen and Tuomainen acknowledged the limitations of the findings due to the small number of respondents, but the results of the students' feedback were beneficial for the researchers and enabled them to consider areas of further research. The research questions related to the students' perceptions of Virtually Finnish as a language learning resource, as opposed to their actual progress in the language. The learners reported that the tool increased their motivation and that they learnt new vocabulary and enjoyed reading. The researchers were unsure of what to expect at the start of the project, and therefore, it was appropriate to use a qualitative method in this case. They report that the feedback provided useful insights into the learners' perceptions and prompted other questions for future research.

RU_CALL (Runyakitara)

Runyakitara is a Bantu language with a complex morphology spoken in western Uganda. Katushemererwe and Nerbonne (2015) report on RU_CALL, a CALL system for Runyakitara meant to enable learners to enhance their knowledge of grammar and acquire writing skills in Runyakitara. The target group of learners was adult children of native speakers who had migrated from Runyakitara-speaking areas to other parts of Uganda. These children had only very basic language skills—Dorian (1977) uses the term *semi-speakers*—but wished to improve their language skills and literacy in Runyakitara as they grew older. Katushemererwe and Nerbonne (2015) used the term *re-learners* as the target learner group had varying levels of Runyakitara ability. They noted that these learners had little access to formal teaching, and therefore, CALL resources could be of a benefit to them. The RU_CALL system used NLP to generate a large base of exercise material and it focused on nouns. Three of the research questions were the following: How do experts evaluate the appropriateness of the system? How do learners evaluate CALL system for Runyakitara? Do they find the system to be useful? Although not specifically stated by the authors, this was probably the first ICALL system for Runyakitara and it was important to check the accuracy of the CALL resources with experts, especially given the morphological complexities of the language. Experts (N = 3) provided judgmental responses via a checklist and a questionnaire. The authors noted that there were not many Runyakitara experts, and this applies to some LCTL and many EL contexts. The checklist had yes/no answers, and the questionnaire had both structured and open-ended questions. Overall, the experts were happy with the system in terms of effectiveness, coverage, and content accuracy, while they were not happy with the random selection for content for learning and felt it should have been more pedagogically and systematically structured. This information, which was not anticipated by the researchers, came to light via the open-ended questions. The learners (N = 20) filled out a questionnaire to provide feedback on their opinions of the RU_CALL system. The questionnaire contained rating scale questions and open-ended questions. The learners rated the system very highly in terms of usefulness and stated that they found the instructions and content understandable. Some learners reported that they found the system convenient and enjoyable and most said their assessment part was interesting, as it allowed them to revise their answers. At the outset, the researchers were unsure about how RU_CALL would be viewed by the learners, and the open-ended questions provided good insights into their perceptions of the system.

Ojibwemodaa (Ojibwe)

Ojibwe is a Native American indigenous language, with around 1,000, mainly elderly, living speakers. It is an Algonquian language, and Ojibwe language learners find it difficult to learn the language effectively, as they rarely hear it spoken on a daily basis. Hermes and King (2013) describe a project in which urban Ojibwe participants used CALL resources with their families at home. They focus on how the Ojibwemodaa CALL resource, which provides a simulated-immersion experience, may be useful for children and families

in informal contexts. Community involvement and commitment are required for successful language revitalisation efforts (Fishman, 2001). Therefore, one of their main research questions was *How can community members effectively use technology in Indigenous language revitalisation?* Hermes and King (2013) carried out their research with urban learners, as opposed to learners on reservation sites (who were perceived to be more *authentic*). They wanted families to use the CALL resource in the home context and to avoid the (negative) transformation effects in form and function of a language into an academic, frozen, and culturally disconnected register when taught in a school-based context. Also, schools tended not to promote use of the language outside of school (see Hornberger, 1997). Hermes and King (2013) wanted the Ojibwemodaa CALL resource to foster intergenerational, family-based activity at home. Ojibwe was not the home language for the participant families in the study. Research on family language policy helped the researchers' understanding of aspects of child language development. However, there were fewer research findings for the situations in which both the child and the parents were language learners and also for how families could make the transition from a language of formal instruction to one that was used for communication at home.

Hermes and King (2013) report on a fine-grained qualitative analysis of language and technology use by two families. The participating families kept a daily log of their Ojibwemodaa activities and, toward the end of the project, they self-recorded daily family talk. They were visited weekly and interviewed (on video-tape) about their language learning and use and their Ojibwemodaa activities. They were also video-taped using the CALL software. The researchers used qualitative discourse analysis techniques (King & Fogle, 2013) to analyse how the participants used the software. The multifaceted qualitative tools used to evaluate the project (i.e., daily logs, interviews, videos) provided the researchers with a rich set of data that would have been difficult to capture otherwise due to the outside-the-classroom (i.e., home) CALL setting. They were able to see that the Ojibwemodaa resource helped to scaffold the language learning process and also provided a structure for the learners to use Ojibwe together as a family.

Computer-Assisted Ndj bbana

Ndj bbana is spoken by the Kunib dji people who live in Maningrida, in Northern Australia. The language is spoken as an L1 by members of the community, and they have strong roots to the land. Auld (2002) reports on a CALL system for Ndj bbana called Computer-assisted Ndj bbana (CAN). The aim of the system was to enable users (young children) to become print literate in their own language. Auld described the CAN system as a set of talking books on a touchscreen computer with text and multimedia resources. The system had several aims, including making the complexity of Ndj bbana more accessible to students, improving literacy, promoting Kunbi dji involvement in education, and increasing available means of expression (via the production of electronic resources for their language). The CAN project aimed to develop contextually relevant electronic resources for Ndj bbana in collaboration with the Kunib dji. The setting was informal, and while the development of the resources took place in the daytime in a school, the resources were used at night time in the community. There were usually 6–10 children around a screen, with one learner touching the screen to use the resources. Auld reported that there were no words for *letter*, *word*, or *sentence* in Ndj bbana. This lack of meta-language in Ndj bbana complicated the process of explaining linguistic features. Auld outlined the methodology that he used to evaluate the CAN resources. He used a mixture of vignettes, video analyses, field notes, and conversations with adults. He also triangulated his observations with Kuni dji adults in real-time to check his understanding and conclusions. Auld's use of a variety of qualitative research tools provided him with insights into the role the CAN resource could play as a link between print and oral literacies, in inter-generational use of resources, and in cultural transformation.

Discussion and Conclusion

It is not clear if the lack of focus on evaluation is real or just that is under-reported in the LCTL and EL CALL literature. Few EL CALL research articles attain the standard for quantitative research described by Vandewaetere and Desmet (2009). Therefore it is difficult for EL CALL researchers to publish in journals

that seek robust, quantitative research. In the Võro Oahpa context, Uibo et al. (2017) are keen to explain that their CALL system for Võro is built using good NLP techniques, as NLP CALL specialists are their primary audience. Their project may be at an early stage of development, but there is limited information about end user testing and planned evaluation approaches. This lack of information, particularly in relation to the learner experience, is not uncommon and only serves to highlight the dearth of publications on quantitative research in LCTL and EL CALL contexts.

Lehtonen and Tuomainen (2003) used qualitative methods to evaluate the learners' perception of using the Virtually Finnish system. Their open-ended questions enabled them to understand the learners' thoughts on the system, which at the time was quite novel for a LCTL. Katushemererwe and Nerbonne (2015) were researching in a space with several unknown variables and a qualitative approach enabled them to understand both experts' and learners' perceptions of the RU_CALL system. Hermes and King (2013) used a variety of qualitative techniques and this enabled them to provide a rounded analysis of the Ojibwemodaa CALL system. Auld's (2002) CAN project provides a good example of how qualitative research can be used to evaluate CALL resources in ML or EL contexts. Given the context of the research projects for Ojibwe and Ndj bbana, especially the non-traditional settings and novelty of the CALL resources (from a language point of view), it would have been logistically and culturally very difficult to carry out quantitative research. These diverse studies show what can be achieved by conducting qualitative research in LCTL and EL contexts. A common feature of these studies is that the researchers knew from the outset that there were many unknowns in relation to the implementation and deployment of the CALL resources and decided to use qualitative approaches to provide insights into these unknown factors. The aforementioned examples illustrate how different qualitative techniques can be used effectively with limited resources to evaluate the different learner goals in LCTL and EL contexts.

The perception of quantitative research being about cognition and qualitative research being about social aspects has moved on in recent years. It is important to engage with multiple perspectives and paradigms. Multiple research perspectives should be layered to provide better insights and to deal with different experiences (King & Mackey, 2016). This is particularly relevant in ML and EL contexts, as the researchers and participants involved may come from a range of backgrounds and have different perspectives and foci. However, while good in theory, it is harder to achieve in practice and is something ML and EL CALL researchers should consider at the outset of CALL projects. Kovach (2010) and Smith (2013) look at the complex intersection between research and indigenous communities, many of whom speak MLs and ELs. Their insights into the need for researchers to be familiar with indigenous methodologies are particularly relevant when considering the role of qualitative research in EL CALL.

There are extra challenges for qualitative evaluation in EL contexts. As Haag and Coston (2002) point out, it may neither be feasible nor comfortable to ask learners to fill out surveys. In an online learning scenario, which may be common in some LCTL and EL learning contexts with widely geographically dispersed learners, it is difficult to determine who are the real learners perhaps spending more time using the resources and who are merely curious and not really using the resources (Lehtonen & Tuomainen, 2003). This may have an impact on the quality and relevance of the learners' feedback. Note that MOOC researchers encounter similar problems. But in general, MOOC learners have at least some registration component, whereas in ML and EL contexts, this may not be the case.

Anonymous surveys are one of the tools used in qualitative research, particularly to learn about students' and teachers' perceptions of CALL materials. Their value to researchers lies in the fact that the participants may provide frank replies to the questions being asked. In some EL contexts (e.g., North American indigenous languages), there may be cultural difficulties in providing such feedback on CALL resources. Concepts such as respect for elders (McNally, 2009) and for the language may mean that it is difficult for learners to provide (negative) critiques of a CALL resource, as they may feel that they are in some way indirectly criticising those involved in the development of the materials or the language itself. One possible solution is for the CALL researchers to emphasise that any critique of the CALL resources will be used to improve the resources and their feedback is very important and valued in this process.

Observation is another useful qualitative tool for CALL research. In the EL context, many of the CALL researchers come from outside the EL community, and it is important to be aware of this when analysing these observations. In order for researchers to control for their own biases, they should be aware of indigenous research issues—Kovach (2010) and Smith (2013) are useful resources in this regard. In some ML and EL contexts, there may be a need to balance a Western philosophy or scientific approach with one that is more in tune with the culture of the community. Informal group discussions, vignettes, and feedback via stories may provide more useful insights than a quantitative approach that may be alien to the community. It is also important to avoid (negative) unintended consequences that can arise with the development of a CALL system in a community where there are few, if any, native speakers and competing dialects, or where it is perceived as a threat to traditional pedagogical practices or intergenerational authority relations (Nevins, 2004).

This paper only reviews CALL resources for four languages, and while some of the research is over 10 years old, many of the issues in the research are still pertinent today. The examples show how qualitative approaches can help to answer some research questions where there are many unknowns and where learners' attitudes and perceptions are key areas of concern—rather than gains in linguistic knowledge alone. The information presented here is from a CALL perspective, but it is only one aspect of a much bigger tapestry that includes technological, sociological, anthropological, political, ethnographical, and other perspectives. Environmental and historical contexts are key components of learner, teacher, and CALL environments. It is important to consider the complex ecological, sociocultural, and institutional relationships between these environments. Qualitative research approaches can help in this regard.

The use of qualitative tools is important in LCTL and EL CALL contexts. They can provide information about CALL resources from the learners' points of view that cannot be captured by quantitative tools alone. Qualitative approaches can be productive with well-documented LCTLs with a small number of learners (Finnish), as well as for LCTLs with limited documentation or a limited number of language experts, whose learners are semi-speakers (Runyakitara). In the EL context, qualitative tools, particularly when triangulated, provide holistic information about the ability to use CALL resources in real-world, out-of-classroom contexts. Videos, interviews, and observations are useful for CALL researchers working in first-of-its-kind CALL resources (e.g., Ojibwe, Njd bbana). Qualitative research can inform CALL design and development so that LCTL and especially EL learners can have a rewarding language learning journey.

Acknowledgements

The author would like to thank the editors of this special issue and the anonymous reviewers for their thorough reviews of the paper and their insightful and helpful suggestions.

References

Auld, G. (2002). The role of the computer in learning Ndj bbana. *Language Learning & Technology*, *6*(2), 41–58.

Austin, P. K., & Sallabank, J. (Eds.). (2011). *The Cambridge handbook of endangered languages*. Cambridge, UK: Cambridge University Press.

Bodnar, S., Cucchiarini, C., Strik, H., & van Hout, R. (2016). Evaluating the motivational impact of CALL systems: Current practices and future directions. *Computer Assisted Language Learning*, *29*(1), 186–212.

Brecht, R. D., & Walton, A. R. (1994). National strategic planning in the less commonly taught languages. *The Annals of the American Academy of Political and Social Science*, *532*(1), 190–212.

Brinton, D. M., Kagan, O., & Bauckus, S. (Eds.). (2017). *Heritage language education: A new field emerging*. New York, NY: Routledge.

Brown, A. V. (2009). Less commonly taught language and commonly taught language students: A demographic and academic comparison. *Foreign Language Annals*, *42*(3), 405–423.

Carreira, M. (2004). Seeking explanatory adequacy: A dual approach to understanding the term. *Heritage Language Journal*, *2*(1), 1–25.

Chapelle, C. A., & Voss, E. (2016). 20 years of technology and language assessment in Language Learning & Technology. *Language Learning & Technology, 20*(2), 116–128.

Charitonos, K., Charalampidi, M., & Scanlon, E. (2016). Using object-based activities and an online inquiry platform to support learners' engagement with their heritage language and culture. In S. Papadima-Sophocleous, L. Bradley, & S. Thouësny (Eds.), *CALL communities and culture: Short papers from EUROCALL 2016* (pp. 87–93). Dublin, Ireland: Research-publishing.net.

Chen, H. C., Hsu, C. C., Chang, L. Y., Lin, Y. C., Chang, K. E., & Sung, Y. T. (2013). Using a radical-derived character e-learning platform to increase knowledge of Chinese characters. *Language Learning & Technology*, *17*(1), 89–106.

Cormack, M. (2007). Introduction: Studying minority language media. In M. Cormack & N. Hourigan (Eds.), *Minority language media: Concepts, critiques, and case studies* (pp. 1–16). Clevedon, UK: Multilingual Matters.

Dauenhauer, N. M., & Dauenhauer, R. (1998). Technical, emotional, and ideological issues in reversing language shift: Examples from Southeast Alaska. In L. Grenoble & L. Whaley (Eds.), *Endangered languages: Current issues and future prospects* (pp. 57–98). Cambridge, UK: Cambridge University Press.

De Graaf, T., van der Meer, C., & Jongbloed-Faber, L. (2014). The use of new technologies in the preservation of an endangered language: The case of Frisian. In M. C. Jones (Ed.), *Endangered languages and new technologies* (pp. 141–149). Cambridge, UK: Cambridge University Press.

Denzin, N. K. (2009). The elephant in the living room: Or extending the conversation about the politics of evidence. *Qualitative Research*, *9*(2), 139–160.

Dorian, N. C. (1977). The problem of the semi-speaker in language death. *Linguistics*, *15*(191), 23–32.

Dörnyei, Z., & Schmidt, R. (Eds.). (2001). *Motivation and second language acquisition* (Vol. 23). Honolulu, HI: National Foreign Language Resource Center.

Dörnyei, Z., & Ushioda, E. (2013). *Teaching and researching: Motivation*. New York, NY: Routledge.

Edwards, V., Pemberton, L., Knight, J., & Monaghan, F. (2002). Fabula: A bilingual multimedia authoring environment for children exploring minority languages. *Language Learning & Technology*, *6*(2), 59–69.

Eurostat. (2017). Foreign language learning in the EU. Retrieved from http://ec.europa.eu/eurostat/news/themes-in-the-spotlight/language-learning

Fishman, J. A. (Ed.). (2001). *Can threatened languages be saved? Reversing language shift, revisited: A 21st century perspective* (Vol. 116). Clevedon, UK: Multilingual Matters.

Furman, N., Goldberg, D., & Lusin, N. (2010). *Enrollments in languages other than English in United States institutions of higher education, Fall 2009*. New York, NY: Modern Language Association. Retrieved from https://apps.mla.org/pdf/2009_enrollment_survey.pdf

Galla, C. K. (2016). Indigenous language revitalization, promotion, and education: Function of digital technology. *Computer Assisted Language Learning*, *29*(7), 1137–1151.

Gardner, R. C. (1985). *Social psychology and second language learning: The role of attitudes and motivation*. London, UK: Arnold.

Godwin-Jones, R. (2013). Emerging technologies: The technological imperative in teaching and learning less commonly taught languages. *Language Learning & Technology*, *17*(1), 7–19.

Grenoble, L. A., & Whaley, L. J. (1998). *Endangered languages: Current issues and future prospects.* Cambridge, UK: Cambridge University Press.

Grenoble, L. A., & Whaley, L. J. (2006). *Saving languages: An introduction to language revitalization*. Cambridge, UK: Cambridge University Press.

Grinevald, C., & Pivot, B. (2013). On the revitalization of a 'treasure language': The Rama language project of Nicaragua. In M. Jones & S. Ogilvie (Eds.), *Keeping languages alive: Documentation, pedagogy, and revitalization* (pp. 181–197). Cambridge, UK: Cambridge University Press.

Haag, M., & Coston, F. (2002). Early effects of technology on the Oklahoma Choctaw language community. *Language Learning & Technology*, *6*(2), 70–82.

Hale, K., Krauss, M., Watahomigie, L. J., Yamamoto, A. Y., Craig, C., Jeanne, L. M., & England, N. C. (1992). Endangered languages. *Language*, *68*(1), 1–42.

Heigham, J., & Croker, R. (Eds.). (2009). *Qualitative research in applied linguistics: A practical introduction*. New York, NY: Springer.

Heller, M., & Duchêne, A. (2008). Discourses of endangerment: Sociolinguistics, globalization. In A. Duchêne & M. Heller (Eds.), *Discourses of endangerment: Ideology and interest in the defence of languages* (pp. 11–13). New York, NY: Bloomsbury.

Hermes, M., & King, K. A. (2013). Ojibwe language revitalization, multimedia technology, and family language learning. *Language Learning & Technology*, *17*(1), 125–144.

Hinton, L. (2001). Language revitalization: An overview. In L. Hinton & K. Hale (Eds.) *The green book of language revitalization in practice* (pp. 3–18). San Diego, CA: Academic Press.

Hinton, L., & Hale, K. (Eds.). (2001). *The green book of language revitalization in practice*. San Diego, CA: Academic Press.

Holton, G. (2011). *The role of information technology in supporting minority and endangered languages*. In P. K. Austin & J. Sallabank. (Eds.), *The Cambridge handbook of endangered languages* (pp. 371–400). Cambridge, UK: Cambridge University Press.

Hornberger, N. H. (1997). Literacy, language maintenance, and linguistic human rights: Three telling cases. *International Journal of the Sociology of Language*, *127*, 87–103.

Hornberger, N. H., & Wang, S. C. (2008). Who are our heritage language learners? Identity and biliteracy in heritage language education in the United States. In D. M. Brinton, O. Kagan, & S. Bauckus (Eds.), *Heritage language education: A new field emerging* (pp. 3–35). New York, NY: Routledge.

Hugo, R. (2014). Endangered languages, technology, and learning: Immediate applications and long-term considerations. In M. C. Jones (Ed.). *Endangered languages and new technologies* (pp. 95–110). Cambridge, UK: Cambridge University Press.

Huss, L. M. (1999). *Reversing language shift in the far north: Linguistic revitalization in northern Scandinavia and Finland*. Uppsala, Sweden: Acta Universitatis Upsaliensis.

Jones, M. C. (Ed.). (2014). *Endangered languages and new technologies*. Cambridge, UK: Cambridge University Press.

Katushemererwe, F., & Nerbonne, J. (2015). Computer-assisted language learning (CALL) in support of (re)-learning native languages: The case of Runyakitara. *Computer Assisted Language Learning*, *28*(2), 112–129.

King, A. (2004). *Shimumachti nawat!: Curso de lengua Náhuat para adultos*. San Salvador, El Salvador: IRIN publicaciones.

King, K. A., & Fogle, L. W. (2013). Family language policy and bilingual parenting. *Language Teaching*, *46*(2), 172–194.

King, K. A., & Hermes, M. (2014). Why is this so hard?: Ideologies of endangerment, passive language learning approaches, and Ojibwe in the United States. *Journal of Language, Identity, & Education*, *13*(4), 268–282.

King, K. A., & Mackey, A. (2016). Research methodology in second language studies: Trends, concerns, and new directions. *The Modern Language Journal*, *100*(S1), 209–227.

Kovach, M. (2010). *Indigenous methodologies: Characteristics, conversations, and contexts*. Toronto, Canada: University of Toronto Press.

Kyppö, A. (2014). Learning Slovak in an e-learning environment: A case study. *APPLES-Journal of Applied Language Studies*, *8*(1) 127–146.

Lasimbang, R., Miller, C., & Otigil, F. (1992). Language competence and use among coastal Kadazan children. In W. Fase, K. Jaspaert, & S. Kroon (Eds.), *Maintenance and loss of minority languages* (pp. 333–355). Amsterdam, Netherlands: John Benjamins.

Lehtonen, T., & Tuomainen, S. (2003). CSCL–A tool to motivate foreign language learners: The Finnish application. *ReCALL*, *15*(1), 51–67.

LeLoup, J., & Ponterio, R. (1998). On the net: Resources for instructors and learners for less commonly taught languages. *Language Learning & Technology*, *1*(2), 3–6.

Lemus, J. E. (1997). Formación de palabras y léxico pipil. In J. E. Lemus, M. B. Richards, & G. R. Vásquez (Eds.), *Estudios lingüísticos* (pp. 45–89). San Salvador, El Salvador: Consejo Nacional para la Cultura y el Arte.

Levy, M. (2015). The role of qualitative approaches to research in call contexts: Closing in on the learner's experience. *CALICO Journal*, *32*(3), 554–568.

Levy, M., Hubbard, P., Stockwell, G., & Colpaert, J. (2015). Research challenges in CALL. *Computer Assisted Language Learning*, *28*(1), 1–6.

McNally, M. D. (2009). *Honoring elders: Aging, authority, and Ojibwe religion*. New York, NY: Columbia University Press.

Moseley, C. (Ed.). (2010). *Atlas of the world's languages in danger*. Paris, France: UNESCO.

Nettle, D., & Romaine, S. (2000). *Vanishing voices: The extinction of the world's languages*. Oxford, UK: Oxford University Press.

Nevins, M. E. (2004). Learning to listen: Confronting two meanings of language loss in the contemporary White Mountain Apache speech community. *Journal of Linguistic Anthropology*, *14*(2), 269–288.

Nielsen, H. L., & Carlsen, M. (2003). Interactive Arabic grammar on the Internet: Problems and solutions. *Computer Assisted Language Learning*, *16*(1), 95–112.

Noels, K. (2005). Orientations to learning German: Heritage language learning and motivational substrates. *Canadian Modern Language Review*, *62*(2), 285–312.

Norton, B., & Toohey, K. (2011). Identity, language learning, and social change. *Language Teaching*, *44*(4), 412–446.

Ochs, E. (1993). Constructing social identity: A language socialization perspective. *Research on Language and Social Interaction*, *26*(3), 287–306.

Ostler, N., & Reyhner, J. (2002). From the special issue editors. *Language Learning & Technology*, *6*(2), 2–3.

Patterson, H. (2014). Keyboard layouts: Lessons from the Me’phaa and Sochiapam Chinantec designs. In M. C. Jones (Ed.). *Endangered languages and new technologies* (pp. 49–66). Cambridge, UK: Cambridge University Press.

Polinsky, M., & Kagan, O. (2007). Heritage languages: In the ‘wild’ and in the classroom. *Language and Linguistics Compass*, *1*(5), 368–395.

Robin, R. M. (2013). CALL and less commonly taught languages. In M. Thomas, H. Reinders, & & M. Warschauer (Eds.), *Contemporary computer-assisted language learning* (pp. 303–321). London, UK: Bloomsbury.

Rossman, G. B., & Rallis, S. F. (2003). *Learning in the field: An introduction to qualitative research*. Thousand Oaks, CA: Sage.

Sauro, S. (2016). Does CALL have an English problem? *Language Learning & Technology*, *20*(3), 1–8.

Scott Warren, A., & Jennings, G. (2014). Allant contre vent et mathée: Jèrriais in the twenty-first century. In M. C. Jones (Ed.). *Endangered languages and new technologies* (pp. 127–140). Cambridge, UK: Cambridge University Press.

Simons, G. F., & Fennig, C. D. (2017). *Ethnologue: Languages of the world.* Dallas, TX: SIL International.

Smith, L. T. (2013). *Decolonizing methodologies: Research and indigenous peoples*. London, UK: Zed Books.

Stickler, U., & Hampel, R. (2015). Qualitative research in CALL. *Calico Journal*, *32*(3), 380–395.

Stockwell, G. (2013). Technology and motivation in English-language teaching and learning. In E. Ushioda (Ed.), *International perspectives on motivation* (pp. 156–175). London, UK: Palgrave Macmillan.

Syed, Z. (2001). Notions of self in foreign language learning: A qualitative analysis. *Motivation and Second Language Acquisition*, *23*, 127–148.

Thompson, I. (2013). (Ed.). Special issue on less commonly taught languages. *Language Learning & Technology*, *17*(1).

Uibo, H., Rueter, J., & Iva, S. (2017). Building and using language resources and infrastructure to develop e-learning programs for a minority language. In E. Volodina, I. Pilán, L. Borin, G. Gintare, & K. Nilsson Björkenstam (Eds.), *Proceedings of the Joint 6th Workshop on NLP for Computer Assisted Language Learning and 2nd Workshop on NLP for Research on Language Acquisition at NoDaLiDa, Gothenburg* (pp. 61–67). Linköping, Sweden: Linköping University Electronic Press.

Ushioda, E. (Ed.). (2013). *International perspectives on motivation: Language learning and professional challenges*. New York, NY: Springer.

Valdés, G. (1999). Heritage language students: Profiles and possibilities. In J. K. Peyton, D. A. Ranard, & S. McGinnis (Eds.), *Heritage languages in America: Preserving a national resource* (pp. 37–80). McHenry, IL: CAL.

Van Deusen-Scholl, N. (2000). *Toward a definition of heritage language: Pedagogical and sociopolitical considerations*. Paper presented at American Association of Applied Linguistics Annual Conference, Vancouver, British Columbia.

Vandewaetere, M., & Desmet, P. (2009). Introducing psychometrical validation of questionnaires in CALL research: The case of measuring attitude towards CALL. *Computer Assisted Language Learning*, *22*(4), 349–380.

Villa, D. J. (2002). Integrating technology into minority language preservation and teaching efforts: An inside job. *Language Learning & Technology*, *6*(2), 92–101.

Vlugter, P., Knott, A., McDonald, J., & Hall, C. (2009). Dialogue-based CALL: A case study on teaching pronouns. *Computer Assisted Language Learning*, *22*(2), 115–131.

Ward, M. (2002). Issues in the design, construction, and use of language resources (LR) for endangered languages (ELs). In *Proceedings of the Third International Conference on Language Resources and Evaluation* (pp. 808–812). Retrieved from http://www.lrec-conf.org/proceedings/lrec2002/pdf/108.pdf

Ward, M. (2004). The additional uses of CALL in the endangered language context. *ReCALL*, *16*(02), 345–359.

Ward, M. (2016). CALL and less commonly taught languages: Still a way to go. In S. Papadima-Sophocleous, L. Bradley, & S. Thouësny (Eds.) *CALL communities and culture: Short papers from EUROCALL 2016* (pp. 468–473). Dublin, Ireland: Research-publishing.net.

Ward, M., & van Genabith, J. (2003). CALL for endangered languages: Challenges and rewards. *Computer Assisted Language Learning*, *16*(2-3), 233–258.

Wiley, T. G. (1999). On defining heritage languages and their speakers. In J. K. Peyton, D. A. Ranard, & S. McGinnis (Eds.), *Heritage languages in America: Preserving a national resource* (pp. 29–36). McHenry, IL: CAL.

Wilson, W. H., & Kamanā, K. (2001). Mai loko mai o ka ‘i’ini: Proceeding from a dream”: The Aha Punana Leo connection in Hawaiian language revitalization. In L. Hinton & K. Hale (Eds.) *The green book of language revitalization in practice* (pp. 147–176). San Diego, CA: Academic Press.

Winke, P., Goertler, S., & Amuzie, G. L. (2010). Commonly taught and less commonly taught language learners: Are they equally prepared for CALL and online language learning? *Computer Assisted Language Learning*, *23*(3), 199–219.

Appendix. Terminology

Computer-Assisted Language Learning

Computer-assisted language learning (CALL) refers to the use of computing technologies in the language learning process. It can denote the use of a resource designed specifically for language learning or the use of computing technologies as means of language learning.

Most Commonly Taught Language

The term *most commonly taught language* (MCTL) refers to those languages most taught and studied (in a particular part of the world). English is the most commonly taught language in the world and dominates CALL literature (Sauro, 2016). In Europe, English, French, German, and Spanish are considered MCTLs as they are the languages most studied as L2s in European schools (Eurostat, 2017); while in the US, Spanish would be the most studied L2 (Furman et al., 2010). While there are geographic variations, the characteristics of MCTLs are similar in that there is usually a range of resources available to teachers and learners and that the teachers may be pedagogically trained in language teaching.

Less Commonly Taught Language

The term *less commonly taught language* (LCTL) refers to a language that is less frequently studied in a

particular part of the world. There is no direct correlation between a LCTL and the number of speakers of a language. There are approximately one billion speakers of Mandarin, yet it is not a commonly studied language, although this is changing slightly. Furman et al. (2010) provide an overview of the number of students who study LCTLs in the US. While there may be a low number of students at a global level, there are learners of LCTLs who want or need to learn a LCTL. Sauro (2016) uses the term non-global language to refer to Swedish and points out the language learning needs of migrants to Sweden. Many non-global languages fall into the LCTL category and Brecht and Walton (1994) use the term *much less commonly taught language* to cover languages that are seldom taught. As Godwin-Jones (2013) notes, although there are huge differences between the languages in this category, they have enough in common to be considered as a group.

Heritage Language

The term *heritage language* (HL) is broad and can include immigrant, indigenous, and colonial languages as well as a broad range of perspectives (Brinton, Kagan & Bauckus, 2017; Carreira, 2004; Polinsky & Kagan, 2007; Valdés, 1999; Van Deusen-Scholl, 2000; Wiley, 1999). Within the US context, Hornberger and Wang (2008) define *heritage language learners* as learners who have familial or ancestral ties to a particular language that is not English. They adopt an ecological model which includes social, economic, and political positioning of a language. In the context of this paper, the focus is on HLs that are LCTLs (i.e., those languages that have limited CALL resources available to learners), rather than on languages like Spanish in the US, which although is a HL for many, is a MCTL with many CALL resources for students.

Minority Language

The question of what constitutes a *minority language* (ML) is complex (Cormack, 2007). MLs are languages where the proportion of speakers relative to the population is in the minority. Sometimes, but not always, the language is only spoken by a subset of the population and may be spoken in a limited number of contexts, the language may have low social prestige, and the number of speakers of the language and its domain of use may be decreasing, and the language may be in danger of becoming endangered. In CALL contexts, MLs, excluding those considered MCLTs, could be considered to be a particular type of LCTL.

Endangered Language

Endangered languages (ELs) are languages that are in danger of disappearing—with between 50% and 90% of the world's 6,000+ languages in this category (Nettle & Romaine, 2000). Language loss can be viewed from multiple perspectives including sociological, economic, and linguistic perspectives (Grenoble & Whaley, 1998). Languages can be at different points on the language endangerment scale, but they share many characteristics. ELs cover all languages that are not actively spoken by a community and where there is no intergenerational transmission. Fishman (2001) provides a good overview of threatened languages and the difficulties involved in reversing language shift. Hale et al. (1992) look at the reality of language loss in the modern world and the response of different stakeholders to its loss. UNESCO's *Atlas of the world's languages in danger* (Moseley, 2010) has comprehensive information on languages in danger.

Comment

Although an in-depth exploration of the topic of classifying languages in this manner is outside the scope of this paper, it is important to note several key observations. Labelling a language as a ML does not automatically imply that it is a lesser language, that its speakers come from lower socio-economic groups, or that the language is en route to endangerment. When a language is classified as endangered either by the public at large or by (potential) learners, it can have an impact on the language learning process. Apart from the *why bother* angle (Huss, 1999), it can sometimes confer the language with fragile and sacred statuses, and this may complicate the learning process. King and Hermes (2014) warn of the dangers of endangerment discourse (Heller & Duchêne, 2008) in the context of language learning. Grinevald and Pivot (2013) propose the term *treasure language* to avoid the pejorative associations with the terms EL, HL, and *ethnic language*. A language not having a large number of learners on a global scale does not negate the

need for CALL resources for those learners or imply that learning the language is optional. Consider the case of many recent migrants to Sweden: Swedish is not a MCTL, but the immigrants have a need to learn the language, and CALL resources could help in this regard. Any language can move along the MCTL–LCTL continuum. Chinese and Arabic could currently be classified as LCTLs, but this is changing due to the increasing importance of these languages on a global level.

MLs may be well-documented, with a long written tradition, an active community of literate speakers, and well-educated teachers. They may be standardised with recognised exams, have a high level of social prestige, and be spoken in economically wealthy parts of the world. ELs may be undocumented, with no writing system or written tradition, no active community of speakers, or no literate speakers and educated teachers. They may not be standardised, and there may be several competing dialects. There may be no recognised exams in the ELs, they may have low social prestige, and the languages and their potential learners may be based in economically impoverished parts of the world. MLs and ELs are not the same, and the situation of ELs is obviously more precarious that that of MLs. In the context of this paper, the salient point is that they face extra CALL challenges when compared to CALL for MCTLs. Qualitative research can provide particularly useful insights into this under-researched sub-field of CALL.

About the Author

Monica Ward is a CALL researcher with a particular interest in CALL in less commonly taught and endangered language contexts. She is also interested in intelligent CALL, particularly the integration of NLP and software engineering in CALL.

E-mail: monica.ward@dcu.ie