

**Confirmation Report for the Candidature
of the degree of Doctor of Philosophy**

A Principled Framework of Help Options in Computer-Based Listening

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A PRINCIPLED FRAMEWORK OF HELP OPTIONS IN COMPUTER BASED-LISTENING

Computer-assisted language learning (CALL) has much to offer for language learning. Potentially, students who study a second or foreign language can benefit from directed interactions with digital materials, project-based work and online partnerships. As in other areas, second language (L2) listening researchers have sought to make computer usage more effective by providing help options in their materials. These include transcripts, dictionaries, translations and cultural notes, among others. Although help options have been part of computer-based listening materials for quite a few years and some research has been conducted to particularly investigate whether the interaction with help options influence L2 listening comprehension processes the reasons that stimulate or prevent L2 learners from accessing and interacting with them remain unknown.

1 Context of the study

This study is developed in two main contexts: Computer Assisted Language Learning (CALL) and Human Computer Interaction (HCI). In the CALL¹ context, the study is located within studies in computer-based listening. Given the lack of a definition of this construct in the CALL literature, computer-based listening is defined for this research as the study of applications that expose language learners to aural texts capitalizing on the capabilities of the computer. That is, applications capable of providing repeated and slowed audio text delivery, transcribed texts, captioned audio/video, translations, cultural notes, dictionaries and feedback.

In the context of computer-based listening help options will be the focus of investigation. Help options² are application resources that enable learners to overcome problems with the software and with the language task itself (Cárdenas-Claros and Gruba, 2009). This study is concerned with help options that assist L2 learners in repairing breakdowns in the comprehension of aural materials. Help options are input enhancements that take the form of 1) transcripts and 2) subtitles to read along while listening to aural texts; 3) cultural notes to understand where aural text is contextualized; 4) word definitions presented through glossaries or online dictionaries to look up unknown words; 5) audio control functions (reward/forward/ pause) to replay complete or partial segments of the aural materials; 6) still/dynamic pictures and videos to have a visual representation of the materials; and 7) feedback to assess task completion and learning outcomes. For further discussion see Section 4.1.2.1.

¹ Although Levy (1997) defined CALL as the search for and study of applications on the computer in language teaching and learning the term includes the use of technology for language learning.

² Help options have been explored in CALL research under different names: “help facilities” (Pujolà, 2002; Grgurovic, 2005), “guidance support features” (Hegelheimer & Tower, 2004) “help aids” (Cárdenas-Claros, 2005; Grace; 2000), and “multimedia support resources” (Chun, 2001). No matter the name, the rationale behind its use implies some type of support that assists learners in input comprehension. The term “help options” is preferred in this work because the name implies certain level of autonomy on the part of the learner to decide whether to look for such assistance and when to benefit from it.

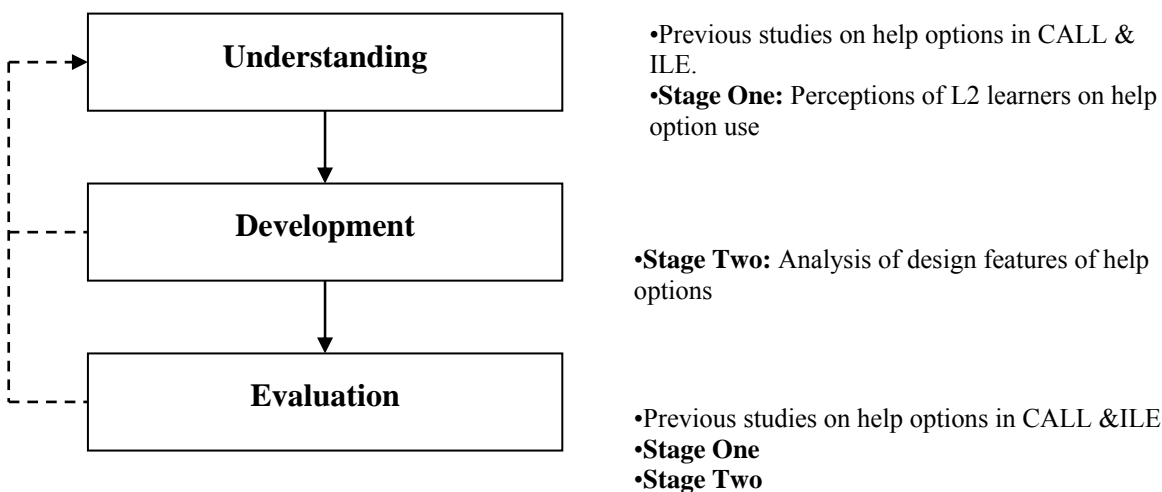
The second main context in which this study is developed is Human Computer Interaction (HCI). HCI is concerned with “the design, implementation and evaluation of interactive computing systems and with the study of major phenomena surrounding them” (Hewet, et al, 1992:6). Among the many theories in HCI, participatory design (PD) will be used to illuminate the study. PD is a set of theories, practices and studies that involve the end-user as a full participant in the design and/or evaluation of software, hardware and computer-based activities (Muller, 1992). Using participatory design (PD) for the current study is pertinent for two main reasons: 1) because CALL lacks a unified theory of design and 2) because the perceptions of L2 learners on help option use and design will be voiced in this research. Since CALL lacks a unified theory of design, the use of PD in this study, in a way, responds to previous CALL research initiatives (i.e. Coalpert, 2004; Farmer & Gruba, 2006; Levy, 2002) aimed at exploring how HCI can inform current practices and future research in the field (see further discussion in Section 4.2.1).

It is pertinent to clarify that this study does not attempt to build upon the amalgam of existing theories in HCI. Instead, established techniques in PD will be used to promote user involvement (L2 learners and language teachers) and to guide data collection and analysis.

2 Research aim

This study aims at creating a principled framework for the understanding, development and evaluation of help options in computer-based listening materials. To develop this framework, information obtained through three main sources will be drawn: 1) previous research on help options in computer-based listening environments and in interactive learning environments; 2) an investigation of L2 learners’ use of help options and; 3) an evaluation design features of help options.

Figure 1. Relationship of the components of the framework of help options



The *understanding* component of the framework will be nurtured by previous research on help options in computer-based listening environments, research on help in interactive learning environments and L2 learner’s perceptions of help option use. The *development* component will be informed from analysis of design features of help options conducted

from a HCI perspective, specifically using participatory design techniques in which L2 learners and teachers will be involved in the evaluation and design of help options for a computer-based listening environment. The final component, the *evaluation* component will result out of the combination and synthesis of findings from the two previous components. This synthesis will allow us to establish a set of criteria for the evaluation of help options. Although the components seem separate at first, they are interdependent as illustrated in Figure 1. That is, as understanding on help options is gained, this knowledge can be used to improve development. Once this development is enhanced, then evaluation criteria can be established. Once evaluation criteria is established and applied to a certain piece of software, then, the understanding of help options can be expanded and this will also be reflected in the development. For an overview of the framework see Section 6.6.

3 Significance of the study

The value of this study stems from the potential that help option use has, not only in facilitating the comprehension of linguistic input but also in facilitating the apperception of such materials to L2 learners. Chapelle (1998) noted that “only which is apperceived has the potential to be acquired” (p.22). In this sense input enhancements operationalized through help options have been used to enrich input, draw learner’s attention towards important aspects of the language and to modify original input in a way that becomes more accessible to learners (Cárdenas-Claros & Gruba, 2009) and that aid text comprehension (Grgurović & Hegelheimer, 2007). However, as noted by Chapelle, Jamieson and Park (1996)

“If learners do not use the help options available to them in a CALL program, then the hypothesized benefits of the computer capabilities for interaction cannot in reality benefit them” (p.39).

Rost (2007) suggests that when help options are included in multimedia environments, the opportunities for input processing are augmented given the chances students have to interact with audio and video segments, transcripts, subtitles, cultural notes, lexical items, and feedback. However, he clarifies that providing listeners with more help options does not necessarily lead to better learning outcomes, it is the interaction with help options what seems to promote language acquisition as inferred from the interaction hypothesis³

Given the increasing number of computer-based listening materials that are designed day by day and include help options, the finding of this study will prove useful for software designers and CALL researchers and practitioners. In understanding the reasons learners have to use or not to use help options in computer-based listening materials and how design features influence help option use, software designers on the one hand, will gain solid understanding of how learner’s variables influence help option use. This identification will assist them to further advance in the design of different components of help options

³ This hypothesis suggests that besides the input the learner is exposed to, manipulation of such input through interaction is what forms the basis for language development (Gass, 1997, Long, 1996) This theory also pinpoints ‘negotiation of meaning’ motivated by breakdowns in understanding, as an essential condition for comprehension, and comprehension is believed to eventually lead to acquisition.

(interface design, amount of control given to learners, location of help options, etc). On the other hand CALL researchers and practitioners will be able to investigate help options in the L2 acquisition framework from a psycholinguistic perspective of language learning. They may also be able to identify meaningful tasks that prompt help option use in a way that promotes L2 acquisition.

4 Literature review

Literature review for this study has been undertaken in the following areas: Second language listening instruction and research, Computer-based listening research, Help options in Interactive Learning Environments, Help options the four language skills, Help options in Computer based listening, Software selection in CALL, Participatory Design, Multimedia Learning theories and Qualitative research methods. However, for the present proposal I report on previous studies in computer-based listening, help options in computer based listening and participatory design.

4.1 Second language listening

Compared to other language skills, people can expect to listen “twice as much as we speak, four times more than what we read and five times more than we usually write” (Morley, 2001: 69). Although SLA researchers acknowledge listening as a key second language skill that plays a crucial role in the development of other language skills (Rost, 2002; Dunkel, 1991) and in second language acquisition processes (Gass, 1997), it still remains an under researched skill (Gruba, 1999; Rost, 2002; Vandergrift, 2007).

4.1.1 *Computer based listening*

CALL scholars agree that when language teaching is assisted through computers, these should provide something that is not available through means traditionally employed for language teaching (i.e. Chapelle, 2003; Levy & Stockwell, 2006; Hoven, 1999). Therefore, materials in computer-based listening environments should capitalize on the computer capabilities to provide learners with input enhancements that ease the demands of language processing (Cárdenas-Claros & Gruba, 2009), cater for individual learning differences (Hoven, 1999) and promote learner-computer interaction (Chapelle, 2003).

Research in computer-based listening has partially evolved from comparing multimedia listening versus traditional listening to examining features of multimedia listening that promote listening comprehension. Studies comparing multimedia listening over traditional listening⁴ have investigated learners’ attitudes toward multimedia (Brett, 1996; Weinberg, 2002), performance (Brett, 1997; Ramirez & Alonzo, 2007), and students’ motivation over time (Brett, 2000). These studies, in general, tend to favour multimedia listening over listening delivered through traditional means. They also acknowledge that the novel effects of the computer that affect performance and motivation decrease over time.

CALL researchers are nowadays more inclined to investigate features of multimedia that seem to promote listening comprehension and the interactionist hypothesis has been helpful in gaining such understanding. In this hypothesis input is viewed as an important factor for

⁴ Traditional listening refers to listening activities delivered through tapes and audio-based labs.

interaction and central for language acquisition, but only if it is noticed or apperceived (Chapelle, 1998). Elaboration and modification of input are more beneficial than simplification of input because elaboration and modification resemble the interactional adjustments used by native speakers in conversations with non-native speakers (Rost, 2002). In traditional listening modification of input was rather difficult and cumbersome for teachers and learners alike (Jones, 2003). Unless learners were provided with translations, pictures and scripts of the aural text in advance or after listening, the opportunities for modification were limited to the explanations given by the class instructor. In multimedia contexts, these modifications can be operationalized as help options that learners can rely on at the moment breakdowns in understanding take place (Grgurović & Hegelheimer, 2007; Cárdenas-Claros & Gruba, 2009). Future studies on the use of help options in multimedia environments are helpful for determining what language learners estimate instrumental for comprehension purposes. However, if students do not make use of these facilities, how can CALL researchers possibly gain such understanding? See further discussion in Appendix A.

4.1.2 Help options in computer-based listening

Help options in computer-based listening are important because learners are provided with access to enhanced input that allows for immediate repairs of understanding breakdowns (Chapelle, 2003). Interaction with help options not only tends to aid aural text comprehension (Grgurović and Hegelheimer, 2007), but also promote language acquisition as inferred from the interaction hypothesis (Rost, 2002). Rost (2007) notes that when help options are included in multimedia environments, the opportunities for processing input are augmented since students can replay, stop and pause segments, read along from transcripts, subtitles and captioned materials, access cultural notes and lexical items, and receive feedback. Despite the perceived advantages, CALL researchers caution help options use, arguing that if not used properly, they can hinder learning instead of enhancing it (Hubbard, 2001; Pujolà, 2002). These concerns are rooted in observations of L2 learners using help options indiscriminately to get a task done. However, researchers agree that when used ‘effectively’, help options hold a great potential for language learning.

4.1.2.1 Types of help options in computer-based listening

The most common types of help options embedded in computer-based listening environments are audio/video control buttons, transcripts, cultural notes, dictionaries, translations, video/dynamic images and feedback.

Audio/video control buttons allow the user to work at their own pace. Therefore, if interruptions in understanding of aural texts occur, learners can rely on these buttons to replay complete segments for two, three, or more times until the text is actually comprehended (Liou, 2000). Language learners may use audio/video control buttons for several reasons: 1) to confirm understanding of learning materials (Hegelheimer & Tower, 2004) 2) to overcome external interruptions that may have affected the flow of the text (Cárdenas-Claros, 2005); 3) to verify that they have grasped different component of the texts (i.e. main ideas, details), 4) to validate initial predictions they had about the text and 5) to physically interact with the computer, among others.

Transcripts are written texts that contain an exact script of an aural text. L2 and FL learners generally rely on them to compensate for their inability to understand an aural text.

However, in some cases, user's lack of knowledge of the target language is not the only reason to access transcripts. They can be used to: 1) confirm understanding of aural materials (Pujolà, 2002); 2) learn how lexical items are pronounced; and 3) to see how spelling and pronunciation actually match.

Cultural notes explain specific language situations that are unique to the target language and that are unfamiliar to people from a different cultural background. Gestures, expressions, body language and pragmatic clues, among others complement the meaning of utterances included in a particular aural text. L2 or FL may access cultural notes to: 1) understand the target language context and to 2) compare cultural aspects between the target language and his/her mother tongue.

Dictionaries, glossaries, and glossed words list and define vocabulary items contained in an aural or written text. Most of the time, lexical items linked to online dictionaries are predicted not to be part of the language learner's lexicon. Dictionaries glossaries and glossed words are accessed by learners to: 1) improve reading comprehension (Liou, 2000), 2) look up for word meanings (Jones, 2003); 3) to get familiar with the contexts where such words are employed; 4) create a mental representation of how spelling matches pronunciation; 4) verify the meaning of a word; and 5) come across sample sentences that reflect word usage in various language registers.

Translations communicate the meaning of an aural or written text in a language familiar to the users, usually their first language. Translations can be accessed in a number of situations: 1) when language learners are not confident enough about their knowledge of the target language; 2) when learners experience difficulties grasping some concepts or understanding certain lexical items; 3) when learners want to verify their understanding of the aural text in his own language (Jones, 2003) and; 4) when they want to test previous hypotheses of how the target language works with reference to their mother tongue.

Video and dynamic images are visual representations that in most cases contextualize and enrich an aural text providing additional non-linguistic clues that facilitate text comprehension (Jones, 2003). Although some researchers have explored the role of visuals in listening comprehension (i.e. Gruba, 1999) and other researchers argue that their inclusion increases the demands on working memory for L2 learners (Guichon & McLornan, 2008), most tailor-made and applications produced by publishing companies, include visuals as part of their listening instructional materials.

Annotations are extra-information or information presented in a different format (verbal or visual) generally associated to a particular point of an aural text. The information presented in verbal annotations is usually made up of translations, word definitions, cultural notes and transcripts (Jones, 2003). Visual annotations contain still and/or dynamic pictures that complement or enhance the aural text.

Feedback is the message which follows the response entered by learners in a learning situation (Bationo, 1992). Feedback primarily provides learners with information about the correctness of their response (Pujolà, 2002). More elaborated feedback provides learners with additional information that allow them to arrive to the correct answer (Heift, 2002) or that prompt them to interact with other features of the program.

4.1.2.2 Defining effective use of help options in computer based listening

The working definition of 'effective use of help options' adopted for this study is defined as the learners' prompted interaction with help options motivated by two main

reasons: 1) the learner's need to check previous hypothesis he/she has about the language and 2) aural input comprehension problems detected after or while learners interact with original input. The result of such interaction should also comply with two additional conditions: a) assist learners in apperception of input and b) enable learners to perform language tasks. In this work is acknowledged the trouble these conditions may posit for future research given the implicit subjectivity they convey. However, the combination of both observable and non-observable parameters can and will provide clues for a more 'measurable' definition of 'effectiveness' for this particular context. While time of interaction with help options along with measures of performance and task completion rates do fit into observable parameters, learner's self-perceptions and reflections can be used as non-observable parameters.

4.1.2.3 *Research on help options in computer-based listening*

Research on help options in listening environments are grouped in two four main categories: a) help options use vs. non-use, b) student's attitude toward help option use, c) frequency of help option use and performance, and d) help options and learner variables (**Error! Reference source not found.**).

These studies have used mostly tracking systems (i.e. Hegelheimer & Tower, 2004; Cárdenas-Claros, 2005; Heift, 2006; Jones & Plass, 2002) and screen capturing devices⁵ (i.e. Grgurovic, 2005; Pujolà, 2002) to examine learners' actual use of help options. Two of the perceived disadvantages of these tools is that a) data does not include any explanation of student thoughts and processes (Liou, 2000) and b) the accuracy of the data may vary if the learning task and the tracking system/screen capturing device are not altogether compatible (Cárdenas-Claros, 2005). Because of these shortcomings, researchers may fail to discover factors that influence learner behaviors.

These studies also highlight problems that commonly plague CALL research: 1) limited number of participants when the research design (quantitative) requires from more participants (Pujolà, 2002, Ggurovic & Hegelheimer, 2007), 2) time constraints for students to interact with a task (Ggurovic & Hegelheimer, 2007), 3) poorly designed software (Hegelheimer & Tower, 2004), 4) poorly designed help options (Cárdenas-Claros, 2005; Grgurović, 2005; O'Bryan, 2005), and limited data given the lack of help options use (Grgurović, 2005; Hegelheimer & Tower, 2004; Cárdenas-Claros, 2005).

Findings of studies investigating help option use vs, non use indicate that L2 learners frequently use help options ineffectively (Pujolà, 2002; Tower & Hegelheimer, 2004; Cárdenas-Claros, 2005; Grgurović & Hegelheimer, 2007) or ignore them (Grgurović & Hegelheimer, 2007, Cárdenas-Claros, 2005, Pujolà, 2002; Hegelheimer & Tower, 2004). However, when learners use help options, the understanding of texts is increased (Hsu, 1994; Liou, 1997; Grgurović & Hegelheimer, 2007) and rates of task completion and learning outcomes seem to be improved (Jones & Plass, 2002).

⁵ Screen capturing devices are software applications that make visual recordings of student-computer interactions.

Table 1. Summary of studies on help options in computer-base listening

<i>Study</i>	<i>Issues examined</i>	<i>Help options</i>	<i>Data collection</i>	<i>No.</i>	<i>L2</i>	<i>Findings</i>
Attitudes towards help option use						
Jones, 2003	Students' attitudes working with a multimedia environment	Annotations: Textual (translation) & visual (pictures)	Tracking system & interviews	20	French	The combination of visual and written annotations did assist learners in the comprehension of aural passages and in vocabulary retention. Learners found useful the interaction with annotations
Liou, 2000	Perceived effectiveness of help option use	English & Chinese script, background information, vocabulary, pause and backward buttons	Tracking systems & oral interviews	20	ESL	Input with more modes was preferred by learners. Therefore, it was used more often. Re-access of input with larger units was preferred to input with smaller units. The backward button was more frequently used than pause or replay buttons
Frequency of use and performance						
Hsu, 1994	Interactional modifications that aid comprehension	Aural repetition, transcripts & dictionary	Tracking systems & test results	15	ESL	Transcripts were more frequently accessed by learners followed by the aural repetition and the dictionary. Students perceived transcripts to be the most useful tool. Help requests positively correlate with aural comprehension
Liou, 1997	Help option use and performance	English & Chinese script, background info, idioms and word search function	Tracking systems	20	ESL	Effective learners were less likely to seek help and mostly used the English script, the replay function & the Chinese script
Pujolà, 2000	Frequency of use of help options, patterns of use and strategies used by participants	Cultural notes transcripts expert module video control feedback	Screen capturing device, direct observation interviews	22	EFL	No correlation between help options use and participant's proficiency level was found. Learners behaved in varied idiosyncratic ways; difficult to draw global conclusions
Hegelheimer & Tower, 2004	Frequency of help option use & performance	Microphone button, headphone button, repeat button, ABC button & Glossary	Records Manager feature embedded in the program	90	EFL	Help option use is better predictor of performance than time spent with the software; Textual gloss and repetitions of text and audio were underused or ignored.
Grgurović & Hegelheimer 2007	Behavior & performance of students using transcripts and subtitles	Subtitles & Transcript	Screen capturing device & interviews	18	ESL	Students in the higher proficiency group exhibited significant comprehension of the learning materials; more time interacting with subtitles than students in the lower proficiency groups.
Help options and learner variables						
Hoven, 2003	Comparing high and low proficiency learners on their use of help functions.	Grammar reference notes, replay facility, mid-task answer checking.	Informal focus groups	9 each in 3 cohorts	Indonesian	High proficiency learners tended to use help options regularly; Lower proficiency learners tended to increase help options use before tests
Cárdenas-Claros, 2005	Preferred help option of field dependent/independent learners and patterns of behavior	Dictionary & Transcripts	Tracking system, oral interview, post-test results.	20	ESL	Field dependent learners used the transcripts more frequently. Field independent learners use the dictionary instead. No pattern of behavior could be exclusively associated to field dependent or independent learner
Jones, 2006	Effects of collaboration and use of pictorial & written annotations	Combination of visual and written annotations	Tracking systems	68	French	Learners working collaboratively with access to combination of pictorial and written annotations were superior.

Studies examining the relationship between help option use and performance (positive relationship in Jones, 2002; Jones & Plass, 2003; and in Grgurović & Hegelheimer, 2007; no relationship in Liou, 1997, 2000; Pujolà, 2002; negative relationship in Hegelheimer & Tower, 2004) point to the need for further research in help option usage in listening environments. Studies examining learner variables and help option use tend to agree that proficiency level influences help option use: advanced proficiency learners tend to use help options less frequently but more effectively and low proficiency learners use help options more frequently but less effectively (Hoven, 2003). Additionally, learners working collaboratively who have access to combination of pictorial and written annotations were superior.

4.2 Bridging the gap between CALL & HCI

Farmer & Gruba (2006) introduced end-user participation techniques to encourage the active involvement of end-users in the design of CALL applications. They argued that learners can assist software designers through guided, active engagement at all stages of the process.

Coalpert (2004) identified four possible roles a learner plays in CALL (software user, language learner, communicator, and contributor to the design process). Based on specific aspects of design expressed by CALL researchers it is my contention that improved software designs could bolster the efficacy of help option usage and work conducted in end-user development, specifically in participatory design can inform the current study.

4.2.1 Participatory design

Participatory design (PD) is a set of theories, practices and studies that involve the end-user as a full participant in the design and/or evaluation of software, hardware and computer-based activities (Muller, 1992). In PD user involvement is crucial because users are the experts in using computer-based systems and because they are ultimately the ones who create new practices in response to such technologies (Blomberg & Henderson, 1990). However, as pointed by Bødker & Iversen (2002), just a touch of users' hands does not in itself guarantee development of meaningful artifacts. For user involvement to be successful in PD, it needs to be structured, facilitated, and interpreted into directions of use for future designs and, most importantly, easily translated into development (Bødker & Iversen, 2002; Muller, 2003). Muller (2003) argues that different to some traditional methods in HCI which are one directional in nature (i.e. designers analyze the requirements *from* the users, deliver a system *to* the users and collect data *from* the users); PD emphasizes mutuality and reciprocity in a neutral space. Therefore, this space is not exclusively associated to the designer or the user. Instead, it constitutes a 'hybrid space' or a 'third space' that allows for the construction of new relationships and understandings (Bossen, 2002; Muller, 2003).

Although most research in PD has been conducted in work environments, some researchers have integrated PD techniques in the construction of learning environments that include the development of new technologies for children's story telling (Druin, 2002), the creation of language courses (Zaphiris and Zacharia, 2001) and the feasibility and desirability of use of PD for the design of a learning environment in secondary education (Könings, 2007). These studies emphasize user involvement as a means to improve learner's satisfaction and predict successful engagement with the learning environments.

Blomberg & Henderson (1990) note that although different tenets guide PD, three general principles guide most practitioners of the approach: 1) the goal of PD is to improve the quality of work life; 2) the orientation is collaborative; and 3) the process is iterative. The literature consulted shows that the integration of PD for constructing learning environments that promote language learning is limited. However, the tenets of PD can be transferred to multimedia learning environments. The goal in PD within such environment would be to improve the quality of learning by making sure that second language learning needs as perceived by the same learners are addressed through the materials, tasks, and design. The collaborative orientation will assure that not only learners' perceptions are included in different stages of the design development, but also that designers gain understanding of SLA processes. The iteration process will be accomplished as students' feedback is incorporated through addition and corrections to the system providing in this way opportunities for learners to experience the new technology and for designers to understand the learning environment.

5 Research questions

The literature review above points to three main directions that will assist CALL researchers better understand help options in computer-based listening: inquiring into L2 learner's experience to understand what they deem relevant for comprehension purposes in aural environments, examining design features of help options that stimulate their use and identifying tasks that stimulate help option use. The current study will explore two of these directions to answer the following guiding research questions:

1. What triggers L2 learners to use help options in computer-based listening materials?
2. What design features stimulate/prevent L2 learners from using help options in computer-based listening materials?

6 Research design

The current study will be developed in two independent but related stages. Each stage addresses a particular goal that will provide significant data for the construction of the framework of help options in computer-based listening as discussed in Section 2. Stage One seeks to explore the perceptions and behaviors L2 learners to identify the reasons they have for using or not using the help options in the listening tasks of the Longman English Interactive program (LEI©) (see further description in Section 6.2.1.1). Stage Two seeks to identify design features of help options that prompt or prevent L2 learners from using help options.

6.1 Stages description

6.1.1 Stage One: Perceptions and behaviours of L2 learners regarding help option use

Participants for Stage One will be drawn to the study using "purposeful sampling" (Patton, 1990) to obtain variation of data and to assure information-rich cases. Since Stage One seeks to investigate perceptions of L2 learners and most importantly to identify reasons that trigger help option use, fifteen participants will generate rich data because they

will be consulted in three different occasions as discussed in Section 6.3. Additionally, the research design and research questions call for depth of data rather than breadth of data (Patton, 2002).

The participants are enrolled in one of the two programs offered by the Modern Language Department at Universidad Surcolombiana : El Instituto de Lengua Extranjera (ILEUSCO) and the Modern Language Program. The students who attend classes at ILEUSCO belong to different disciplines in the undergraduate programs offered throughout the university. The Modern Language Program forms the future language teachers and researchers in the region. All the students learn English as part of their formation. As a former student, language instructor and researcher, the main researcher developed different connections with the staff, administrative personnel and student from the Modern Language Department who will surely contribute to the successful identification of potential participants.

Data collection for this stage will take place in three one-hour phases: During the *first phase*, participants will be asked to complete an entry questionnaire ⁶ (Appendix B). After that, they will be instructed on how to use the LEI© program, work on listening exercise and answer some questions based on the text. The purpose of this session is twofold: help learners familiarize with the software and assist the researcher to identify the learner's actual proficiency level. During the *second phase*, participants will be asked to work with a different listening exercise contained in the LEI© program and complete the accompanying listening comprehension exercises. As students interact with the listening exercises, Camtasia Studio © 5.0, will record students' work. A semi-structured interview (Appendix C) will be conducted after they complete the comprehension questions. For this interview, participants will be guided to reflect on their experience in working with the program and in interacting with the different help options. The *third phase* will take place a week after phase two. In this session, stimulated recalls using the information obtained through Camtasia Studio © 5.0 (Appendix G) and questions arising from the first interview will be conducted.

6.1.2 Stage Two: Design features of help options that stimulate/prevent L2 learners from using them

Participants for Stage Two will be identified using snowballing techniques. That is, one participant will suggest who else could be invited to participate (Patton, 2002). For this stage, the participants will be three learners of English, a language teacher, and a designer. Second language learners are expected to be enrolled in General English (GE) courses offered by private language institutes in Melbourne.

Data collection for this stage will take place in four-one hour phases. In *phase one*, participants will be individually interviewed using the guiding questions found in Appendixes D, E, and F. Then, each participant will be guided to interact with the help options contained in the listening exercises of the LEI© program. In the *second phase*, working as a team, participants will be encouraged to discuss design features that promote/prevent second language learners from using help options. The discussion will be

⁶ This questionnaire is made up of three sections: the first section inquires about the participants' demographic information. The second section asks participants to describe their previous experience with English in terms of length of language exposure, emphasis of instruction and familiarity with computer-based listening. The third section requires from the participants to self-assess their language ability

prompted through paper prototypes constructed based on both findings obtained in Stage One and replication of interface designs used in commercially available software. In the *third phase*, as a team, participants will be asked to produce a sketch of what in their opinion would be the ideal way to incorporate help options in computer-based listening activities in a way that enhances L2 learning and not hinders it. In the *final phase* and to iterate the design, participants will be prompted to discuss the sketch they produced during the third phase.

Data collection for this stage will take place in Melbourne given the availability of designer.

6.2 Materials

Three types of materials will be used in this study: task component materials, data collection materials and data analysis instruments.

6.2.1 Task component materials

Task component materials correspond to the specific learning tasks participants will be asked to interact with, complete and reflect upon. Initially, I thought about creating the listening tasks, but after further reflection I came to the conclusion that given the high quality of commercially available materials produced nowadays, embarking on such a project would be like re-inventing the wheel. Therefore, I systematically reviewed existing courseware and found that the tasks from the listening component of the English Longman Interactive© program match the research objectives the best. Most of the reasons that favored this selection are rooted in criteria I established from examining relevant CALL studies (See Appendix J).

6.2.1.1 The Longman English Interactive© program

The Longman English Interactive© (LEI©) is “a four-level, video based, integrated skills program” (Longman, 2008) that can be accessed online anywhere and at anytime or in CD ROMS. Although the four levels hold similar characteristics, some differences exist in the conception for levels 1&2: beginner and high beginner and 3&4: intermediate and high intermediate.

Levels 1 & 2: Beginner and high beginner

These levels are organized into three five-unit modules. They emphasize general English and prepare the learner to communicate successfully in everyday situations. Alongside the course overview and review sections for each module, these levels are made up of 8 sections: Listening, Vocabulary, Speaking, Grammar, Listening challenge, Pronunciation, Reading and Writing (Figure 2). Levels 1 & 2 also contain a communication companion where the learning objectives for each of the five units are listed. (For further description of each of the sections see Appendix H).

Figure 2. Sections in the LEI© program: levels 1 & 2

The screenshot shows the user interface for the Longman English Interactive 4 course. At the top, there are navigation tabs for 'Exit', 'COURSE OUTLINE', 'HELP', and 'RESOURCES'. The 'RESOURCES' tab is active, showing links to 'Longman Dictionary', 'Glossary', and 'Grammar Reference'. The main header displays 'Longman English Interactive 4' and 'MODULE A.2 A Hot Lead Unit Home'. A central image shows two people in a meeting. To the right, a vertical menu lists course components: Course Overview, Video Listening, Vocabulary, Speaking, Grammar, Task Listening, Pronunciation, Reading, Unit Summary, and Review Quiz. Below the image, there are buttons for 'COMMUNICATION COMPANION' and 'LEARNING OBJECTIVES'. The footer contains the copyright notice 'Copyright © 2006, Pearson Education, Inc.' and the Pearson logo.

Levels 2 & 3: Intermediate and high intermediate

Levels 3 & 4 are organized into three-four unit modules that are distributed in 8 sections: Video listening, Vocabulary, Speaking, Grammar, Listening task, Pronunciation, Reading and Writing. Levels 2 & 3 revolve around the story line: a drama about a newspaper reporter and a soccer star that accepted a bribe. Other than differences in the Video listening and Listening task sections, the remaining sections in levels 3 & 4 follow the same structure used for levels 1 & 2.

Listening component of the LEI© program

Although it is acknowledged that the Pronunciation and Speaking sections in the four levels of the program also include listening tasks that require from learners to use bottom-up processes to identify and reproduce model sounds, sentences, and dialogues, this study will focus on the listening tasks that favor top-down processes. In top-down processes learners rely on context and prior knowledge (topic, genre, culture, etc) to build a framework for comprehension (Vandergrift, 2007). Thus, the listening tasks selected for learners will be part of the Listening and Listening challenge sections and Video listening and Task listening sections for levels 1&2 and 3&4 respectively. The selection of tasks will be determined by the participant's proficiency level.

Help options in the listening component of the LEI© program

A total of 10 help options are provided for the listening component of the program in all the levels (Figure 3): video, transcripts, cultural notes, audio/video control buttons (play, stop, pause, & rewind/forward), translations, feedback, listening tips, and a set of additional

resources that contain a dictionary, a glossary and grammar notes (for further description see Appendix I).

Figure 3. Help options in the listening section of the LEI© program

English Exit COURSE OUTLINE HELP RESOURCES

Longman English Interactive 1 Go to...

Longman Dictionary
Glossary
Grammar Reference

MODULE A.5 Listening Challenge
1: Extended Listening

Listening Tips Culture Notes

Read the text below the video. Then click on to watch the video.
Read each question and click on the answer.

TRANSCRIPT

1. Who is Jin?
 a. A Korean student
 b. A Japanese student
 c. The instructor

2. What does Jin say?
 a. It's nice to meet you, too.
 b. I'm an instructor, too.
 c. I'm a little nervous, too.

3. What is Jin's last name?
 a. Okada
 b. Brown
 c. Koh

Check Answers

Emi comes to her English class on the first day. She meets the instructor and one student.

6.2.2 Data collection materials

The data collection materials address each of the research questions posited for the study and fulfill the criteria of instruments elaborated under qualitative research paradigms. That is, they provide researchers with rich data that allow them explore in depth the phenomena under investigation (Liamputtong and Ezzy, 2006). The data collection materials include an entry questionnaire (Appendix B), oral interview protocols (Appendices C, D, E, and F), observation schedules (Appendix G) and physical artifacts.

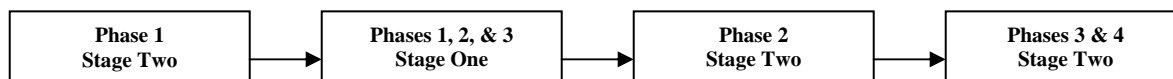
6.2.3 Data analysis materials

The main tool that will assist the study in data analysis will be Nvivo 7©. This qualitative research analysis software will allow us to manage vast quantities of information efficiently and accurately once initial categories have been coded manually. I chose this piece of software because Nvivo 7© has features such as code-and-retrieve and code-and-link-into-models facilities that will help us identify and establish relationships between participants, concepts, and processes.

6.3 Data collection procedures

This study is conceived in Stages One and Two. However, the order for data collection is not sequential (see Section 7). That is, data collection will start with phase 1 of Stage Two. Then, it will move to phases 1, 2 & 3 of Stage One. Next to phase 2 of Stage Two, and finally to phases 3 & 4 of Stage Two as illustrated in (Figure 4). Data collection will take place in this way for several reasons: 1) Data from phase 1 of Stage Two will provide insights for the formulation of questions for participants in Stage One. 2) Data obtained in phases 1, 2 & 3 of Stage One will be used for the construction of the paper prototypes that will be used in phase 3 of stage Two. 3) Analysis of data obtained in Stage One will also be considered in the iteration process achieved in phase 4 of Stage two.

Figure 4. Data collection procedures



6.4 Method

Marshall and Rossman (as cited in Merriam, 2002) suggest that researchers use qualitative research paradigms to 1) understand processes, 2) describe poorly understood phenomena, 3) understand differences between stated and implemented policies or theories and, 4) discover unspecified contextual variables. In the current study, a poorly understood phenomena pointed by previous studies is that L2 learners tend to neglect help options in computer-based listening environments. Since the study seeks to construct of a principled framework of help options, I find imperative not only to include research findings from previous studies, but also L2 learners' perceptions on help option use and design. For this reason, I will use a qualitative research paradigm to collect, analyze and interpret data.

Researchers have used different aspects of the interactionist theory (Long, 1996) of language learning as a framework to interpret learners' interaction with help options. Specifically to understand how listening processes are enhanced as a result of such interaction. However, up-to-date no framework exists for the development and evaluation of help options in CALL. With this gap in mind, qualitative analysis will be used to conceptualize, develop, construct and verify such framework. This framework will derive from systematic data collection and analysis of learners' interaction with help options, their perceptions on the use and design of these facilities (for an overview of the framework see Section 6.6). Grounded theory has been defined as the "study of experience from the standpoint of those who lived it" (Charmaz as cited in Merriam, 2002: 142). That is, theory emerges from the lived experience of the participants, in our case the lived experience of L2 learners as they interact with help options. Categories that emerge from participants' responses will be used to construct the core theory. Other emerging categories resulting from the data will be analyzed from the perspective of the core category and relationships between those emerging categories and the core category will be established.

6.5 Data analysis

For stages one and two, the data will be transcribed and coded to identify emerging patterns of use and non-use and design features that prompt help option use. When

analyzing the data, I intend to code the data at first by hand. In this way, I will be able to have a closer look of the perceptions of the participants. Otherwise, there is the risk that I, unknowingly, impose categories based on our expectations and previous experience and relevant information brought up by the participants may be left aside.

To perform this analysis three types of coding will be used: open coding, axial coding and selective coding (Strauss and Corbin as cited in Merriam, 2002). Through open coding I will be able break down the data and begin the process of categorization. Axial coding will allow us to take initial categories and establish links and relationships between categories. From this type of coding, core categories will be identified and relationships with other categories will be established. Finally, selective coding will help us direct the search of samples contained in the data that will support and compliment the core category.

After initial coding is performed, I intend to use the software Nvivo 7© to ensure a more systematic way of analysis and easier retrieval of information.

6.5.1 *Trustworthiness features*

Merriam (2002) suggests that regardless of the research paradigm used, a study to be trustworthy needs to be “valid, reliable and conducted in an ethical manner” (p.30). In qualitative research specific strategies can be used to enhance trustworthiness. I illustrate the strategies that I will use for promoting validity and reliability (Table 2). To start, I will compare the data collected through the screen capturing device and the participant responses to the first and second interviews. That is, I will triangulate the data obtained from different means. Triangulation is understood as “bringing different kinds of evidence to bear on a problem” (Esterberg, 2002: 176). Data resulting from the second stage will also be triangulated by making use of the participant’s produced sketch, video recordings of the participants as they interact with the program and responses to the interview.

Table 2. Strategies for promoting validity and reliability

<i>Strategy</i>	<i>Description</i>
Triangulation	Using multiple data collection methods (questionnaires, interviews and tracking logs) and participants from different contexts (Colombian educational context and Spanish speakers enrolled in English as a Second Language classes.
Member checks	Asking key participants to read initial analysis to determine how our interpretations reflect their answers.
Peer review	Discussion with colleagues and supervisors the congruency of emerging findings and tentative interpretations.
Adequate engagement in data collection	The number of participants observed and interviewed for each stage will assure saturation of data
Maximum variation	Participants will come all from the same linguistic background (Spanish) I will aim to include a range of participants from different proficiency levels and experience with computer-based listening.
Audit trail	I will keep a track of decisions regarding changes in procedure, data analysis and/or interpretations of data analysis.
Rich thick descriptions	When reporting results rich thick descriptions will help other researchers determine to what extent findings can be transferred to their learning contexts.

To ground the data analysis I will conduct member checks and negative case analysis for both stages of the research. Member checks will be conducted by having participants read a draft of the emerging theory to find out how much they agree with our initial analysis and how accurately they feel they are portrayed and interpreted in the interviews, the observations obtained through the screen capturing device and the sketch they are to produce. Once sounder argumentations are created I will search for negative cases to make sure that our interpretations are entirely supported by the data (Huberman and Miles, 1994).

In writing up the report, I will provide enough description to “contextualize the study such that readers will be able to determine the extent to their situation matches the research contexts, and hence, whether findings can be transferred” (Merriam, 2002: 31). I will also keep an audit trail where a detailed account of the methods, procedures, and decisions made while the study takes place will be kept.

Table 3 summarizes the research design described in the previous sections.

Table 3. Summary of research design

<i>Stages and guiding questions</i>	<i>Participants</i>	<i>Materials</i>			<i>Methodology</i>	<i>Procedure</i>	<i>Data analysis</i>
		<i>Tasks</i>	<i>Collection</i>	<i>Analysis</i>			
Stage one: What triggers L2 learners to use help options in computer-based listening materials?	15 EFL learners	Listening component of the Longman English Interactive© program.	Entry questionnaire. Oral interview Stimulated recall protocols Observation schedules	Nvivo 7©	Qualitative research	Three-one hour sessions Phase one: Consent forms completion, entry questionnaire, exploration of the LEI© program. Phase two: Listening task completion, interview and learner’s interaction with the LEI© program Phase three: Stimulated recalls	Categorical classification within and across cases.
Stage two: What design features stimulate/prevent L2 learners from using help options in computer-based listening materials?	3 ESL learners, 1 designer and 1 language teacher	Listening component of the Longman English Interactive© program.	Oral interview Observation schedules Paper prototypes Physical artifacts	Nvivo 7©	Qualitative research	Four-one hour sessions Phase one: Consent form completion, interview, familiarization with help options Phase two: Paper-prototypes evaluation Phase three: Elaboration of sketch of ideal incorporation of help options. Phase four: Iteration.	Categorical classification across cases

6.6 Expected outcomes

The main expected outcome of this study is the construction of a principled framework of help options in computer-based listening. The way I envision this framework is illustrated in Table 4. The first column sets out each of the components of the framework, namely: understanding, development and evaluation. The second and third columns identify specific principles steaming from SLA and multimedia learning theory respectively. The fourth column introduces some working principles of help options in computer-based listening. Recognizing that this is a first attempt to create such framework, well-defined principles will be added to the framework as more understanding on help option is gained from further exploration of the literature and systematic data analysis.

Table 4. Overview of the principled framework of help options in listening

<i>Framework component</i>	<i>SLA</i>	<i>Multimedia learning</i>	<i>Help options</i>
Understanding	Repair-motivated interaction leads to comprehension and sets the scene for learning (Long, 1996; Pica, 1994; Gass, 1997)		L2 learners use help options effectively when: They detect problems with understanding of learning materials They want to confirm previous hypothesis about how the target language works
	Modification and elaboration of input is more beneficial for language learning than simplification because modification and elaboration resemble the interactional adjustments used by native speakers in conversations with non-native speakers (Long, 1996).	Students learn better from words and pictures than from words alone (Mayer, 2001)	Help option use is increased when input is enhanced both through text and visuals
Development		People learn better when words and letters are physically and temporally integrated (Mayer, 2005)	Help options should be located close to the text
Evaluation			

7 Progress to date and proposed timeline for PhD

Task analysis materials have been evaluated and selected. Data collection materials for stages One and Two have been developed. Additionally, potential participants for piloting materials have been contacted, but I am awaiting ethic approval from the IRS University of Melbourne. Contacts with potential participants for stage Two have also been made.

The following publications and presentations have been completed during the probationary period of the candidature:

- Cárdenas-Claros, M. & Gruba, P. (2009) "Help options in CALL: a systematic review" *CALICO Journal* 27(1)
- Cárdenas-Claros, M. (2008) "Help options in computer based listening: integrating CALL and HCI. *Interaction and Design Group seminar* April 11, 2008. Melbourne, Australia
- Cárdenas-Claros, M. & Gruba, P. (2007) "Help options in computer based listening activities: learning scaffolds or barriers?" In *ICT: Providing choices for learners and learning. Proceedings Ascilite Singapore, 2007.*

The proposed timeline for the PhD is outlined in Table 5.

Table 5. Proposed timeline for PhD

<i>Timeline</i>	<i>Phase of study/writing</i>
April-June, 2007	Initial meetings with supervisors Setting up foundations Help options literature review and paper preparation
June-July, 2007	Criteria for software and site selection Submission for CALICO journal: help options in CALL
July-October, 2007	Classes: Second Language Acquisition and Language Program Evaluation Short paper submission to Ascilite, 2007 Draft: Chapter One: Introduction
November, 2007	Feedback incorporation for paper for the CALICO journal and Ascilite 2007 First international conference on technology, Indonesia
December, 2007	Presentation in Ascilite 2007 conference Draft of confirmation paper: Chapter Three: Research design
January, 2008	Literature review: L2 listening instruction and research. Computer-based listening
February, 2008	Draft of confirmation paper: Chapter Four: Site and software selection
March, 2008	Literature review: HCI and participatory design Draft Chapter Two: Literature review Reviewing chapters 1, 2, 3, & 4 and making necessary changes. Oral presentation IDG seminar
April, 2008	Incorporating feedback from IDG and feedback from supervisors Complete and submit confirmation paper
May, 2008	Confirmation talk Trial of instruments, pilot study and refinement of instruments.
June-July, 2008	Identification of participants for Stage Two. Data collection for Stage Two: Phase one Transcription and translation of interviews Initial analysis
August-mid September, 2008	Break: maternity leave
Mid-September-December, 2008	Identification of participants for stage One Data collection Stage One Transcription/ translations of interviews and stimulated recalls.
January-March, 2009	Data analysis Stage One: coding data and entering info on Nvivo, identification of core categories and relationship. Data collection Stage Two: phase two. Assessment of paper prototypes Paper submission to Recall journal Draft Chapter Five: perceptions and behavior of L2 learners regarding help option use.
April-June, 2009	Data collection and analysis stage two: Phase three. Paper submission to HCI journal Draft Chapter Six: design features that promote help option use.
July-August, 2009	Design of framework of help options in computer-based listening
September-October, 2009	Draft Chapter Seven: Discussion and Conclusions
November-December, 2009	Reviewing all chapters and making changes as necessary
January-March, 2010	Draft complete thesis to supervisors, revisions and submission of final thesis.

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