

THE WEAK LINK IN THE LANGUAGE TEACHING SYSTEM AND WHAT TO DO
ABOUT IT

by

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Abstract

This thesis answers the questions: How should the terms interaction, individualization, and personalization be applied to Computer Aided Language Learning (CALL) software? What progress has been made in their implementation? How can CALL software developers better incorporate them in the future? For each of the three terms, I explain how it is applicable to the CALL software environment by defining it, describing the pedagogical research supporting it, and then giving general guidelines for incorporating it into a CALL software program. I measure the progress of the implementation of the three terms in CALL software through compiling and analyzing data from reviews of 44 software titles. The publication dates of the software titles are from 1981 to 2008. I propose through description and a proof-of-concept software program ways to improve the incorporation of the terms in question into CALL software. As a result of answering the three questions, this thesis shows that the current accepted definitions and ways of implementing interaction, individualization, and personalization need to be improved in order to comply with pedagogical research and make full use of current technology. The general guidelines given in the explanation of each term relative to CALL and the attributes under each term in the analysis of the compilation data provide examples of areas on which to focus development. Additionally, I specifically comment on pedagogically supported attributes within each term that have a weak representation in the software compilation and therefore need more development.

In addition, this thesis is accompanied by “Mis vacaciones”, a proof-of-concept software program, which demonstrates ways to improve the incorporation of interaction, individualization, and personalization into CALL software. In “Mis vacaciones”, the learner takes a virtual trip to Nuevo Leon, Nicaragua. The multimedia sent to the learner by a previous traveler shows Nicaraguan city people and the La Gigatona festival. After visiting, the learner is asked to describe the Nicaraguans that they saw. If the learner needs help, Structured Input activities lead the learner to develop the third person singular imperfect form. Buttons in the software environment provide access to internet sources. The learner is able to draw and take photos to create a visual prop to aid in the description task.

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CHAPTER 1 - Introduction

I refer to the language teaching system (LTS) in the title although the reader is free to generalize the information in this paper to other subsets of the superset, the teaching system. The teaching system is a subset of the education system. Which element is the weak link in the LTS? I define the weak link as the element that has not kept up with the progression of the other elements.

The LTS presently consists of teachers, language pedagogy, technology, and computer aided language learning (CALL) software. Not all of the elements in the LTS have always been the same as they are now. For example, ancient Roman teachers wore togas while teachers now commonly wear business casual attire. The “Evolution of Language Pedagogy” section of this paper presents the progression of pedagogy in the language teaching system. As the “Brief History of Technology in the Classroom” section shows, the technologies used in the classroom have progressed in their potential for student-centered use. For example, in 1967, most classrooms had phonographs and silent filmstrip projectors (Popham, 1969, pp. 334-35). Today, most classrooms or students have access to laptops. Technology is consequently not the weak link. In the early 1980s, personal computers became affordable enough to include in school systems beyond the engineering programs of universities. The introduction of computers as one of the technologies available to teachers also introduced software into the teaching system. Because teachers and learners delegate some or most of the role of teacher to CALL software when learners use it inside and outside of the classroom, they place emphasis on three common instructional practices: interaction, individualization, and personalization. These three attributes of teaching thus become the standard to measure the progress of CALL software. The “Definition of Terms and Their Applications to CALL” section of this paper explains these terms and relates them to CALL software.

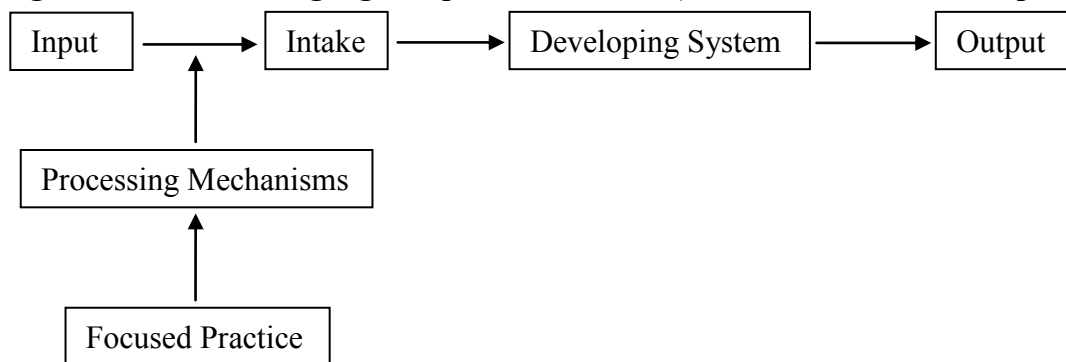
The “Software Compilation” section dissects 44 CALL software titles published from 1981 to 2008 (Appendix A) in order to establish the progression of interaction, individualization, and personalization. Based on the progress shown in the following sections, I conclude that CALL software has not progressed as much as the other elements in the LTS. Therefore, it is the weakest link. However, being the weakest link is not fatal in the LTS. The “Software

Compilation” section also describes ways that software developers can improve CALL software. In Chapter 4, I present my own CALL software program, “Mis vacaciones”, which addresses some of the issues concerning interaction, individualization, and personalization described in the “Software Compilation” section. I present it as a proof-of-concept rather than a model.

Some Useful Definitions

The following definitions offer a brief overview of some terms that this thesis will use and cover more in depth. Figure 1.1 is a general model of the second language acquisition (SLA) process to which some of the definitions will refer in order to contextualize their information.

Figure 1.1 Second Language Acquisition Process (Lee & VanPatten, 2003, p. 142)



Input

According to Lee and VanPatten (2003), “input is the language learners hear [and read] that is meant to convey a message” within a communicative exchange (p. 16). Input, as Figure 1.1 shows, is the root of the SLA process.

Comprehensible Input

Comprehensible input (CI) is input that the learner understands sufficiently to be able “to figure out what the speaker [writer] is saying” (Lee & VanPatten, 2003, p. 26). CI increases the chances that learners will process elements of the language found in the input (pp. 26-27). Input can be made comprehensible by slowing the rate of the input and modifying its vocabulary, syntax, flow, and setting (pp. 29-30). Interaction can also modify input, making it comprehensible (pp. 31-32).

Structured Input

Lee and VanPatten (2003) define structured input (SI) as:
input that is manipulated in particular way to push learners to become dependent on form and structure to get meaning and/or to privilege the form or structure in the input so that learners have a better chance of attending to it (i.e., learners are pulled away from their natural processing tendencies toward more optimal tendencies). (p. 142)

In Figure 1.1, SI activities make up part of the category marked “Focused Practice.” Table 1.1 indicates the six guidelines for developing SI activities that VanPatten (1996) establishes.

Table 1.1 Structured Input Activity Guidelines (Lee & VanPatten, 2003, p. 154; VanPatten 1996)

Guidelines
Present one thing at a time
Keep meaning in focus
Move from sentences to connected discourse.
Use both oral and written input.
Have the learner do something with the input.
Keep the learner’s processing strategies [behaviors] in mind.

Processing Instruction

Processing instruction (PI) is grammar instruction developed by VanPatten with the goal to guide and focus learners’ attention when they process input. In Figure 1.1, PI falls into the “Focused Practice” category. PI has three components: learners are given information about a linguistic structure or form, “learners are informed about a particular processing strategy [behavior] that may negatively affect their picking up the form or structure during comprehension” and learners participate in SI activities (Lee & VanPatten, 2003, p. 154; VanPatten, 1996, pp. 1-11).

Tasks

The word “task” has many definitions. David Nunan (2004) and Rod Ellis (2003), two of the sources used for the task related information in this thesis, refer to seven and nine versions respectively in the process of discussing their own definitions of a pedagogical task. Nunan addresses the issue in this way:

A pedagogical task is a piece of classroom work that involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is focused on mobilizing their grammatical knowledge in order to express meaning, and in which the intention is to convey meaning rather than to manipulate form. The task should also have a sense of completeness, being able to stand alone as a communicative act in its own right with a beginning, a middle, and an end. (2004, p. 4)

The definition that Ellis (2003) arrives at is more specific than Nunan's:

A task is a work plan that requires learners to process language pragmatically in order to achieve an outcome that can be evaluated in terms of whether the correct or appropriate propositional content has been conveyed. To this end, it requires them to give primary attention to meaning and to make use of their own linguistic resources, although the design of the task may predispose them to choose particular forms. A task is intended to result in language use that bears a resemblance, direct or indirect, to the way language is used in the real world. Like other language activities, a task can engage productive or receptive, and oral or written skills, and also various cognitive processes. (p. 16)

These two definitions inform the tasks that I incorporate into "Mis vacaciones", the proof of concept CALL software program that accompanies this thesis.

I use a combination of the two definitions because both do not exactly fit what a task can be in the CALL environment. An example of this is that Nunan refers to a task as "a piece of classroom work" (2004, p. 4). It is, however, difficult to define a classroom when using CALL. A classroom could be typical physical classroom, a learner's home, a learner's office, a bus, a virtual environment or any number of other arrangements. In Nunan's defense, he does specify more thoroughly than Ellis what the learners will do during a task. Ellis defines the learners actions as "process[ing] language pragmatically in order to achieve an outcome" (2003, p. 16). The term "processing" as Ellis uses it refers to comprehending and not to the processing that occurs during SI activities. Ellis also refers to linguistic resources in his definition but fails to mention that learners can and should use nonlinguistic resources such as objects, body language, gestures, and facial expressions. Finally, with CALL, one learner may be performing the task with non-learners (natives, computer simulations or virtual persons); however, both definitions assume that only learners are actors in the task.

Communicative Competence

Communicative competence is composed of four sub-competencies: grammatical, sociolinguistic, discourse, strategic (Savignon, 1997, p. 40). Each of these sub-competencies has extra-linguistic, listening comprehension, reading, socio-cultural, speaking, and writing components. This thesis refers to these components in the software compilation section under the “Works on these competencies” attribute.

Grammar-Translation Method

The Grammar-Translation method was used to teach modern languages in the late nineteenth and early twentieth centuries. Hadley states that, “its primary purpose was to enable students to access and appreciate great literature, while helping them understand their native language better through extensive analysis of the grammar of the target language and translation” (Hadley, 2001, p. 106).

Behaviorist Theory

In the 1940s and 1950s, behaviorist psychology influenced how researchers conceived that language learning occurred (Hadely, 2001, p. 57). This influence carried over into language teaching with the advent of the audiolingual methodology. Table 1.2 is a list of the key tenets of behaviorism.

Table 1.2 Tenets of Behaviorist Theory (Hadely, 2001, p. 57)

Num	Tenet
1	Human learning and animal learning are similar.
2	The child’s mind is a <i>tabula rasa</i> . There is no innate pre-programming specifically for language learning at birth.
3	Psychological data should be limited to that which is observable.
4	All behavior is viewed as a response to stimuli. Behavior happens in associative chains; in fact, all learning is associative in nature.
5	Conditioning involves the strengthening of associations between a stimulus and a response through reinforcement.
6	Human language is a “sophisticated response system” acquired through operant conditioning.

Audiolingual Methodology

In the 1940s and 1950s, descriptive linguistics was influential along with behaviorist psychology (see Behaviorist Theory). Descriptive linguistics is concerned with the structure of languages based on their phonemes and morphemes. Together these two fields of study generated the audiolingual methodology (ALM) of language learning (Hadley, 2001, pp. 57, 110; Lee & VanPatten, 2003, p. 9; Savignon, 1997, pp. 23-26). Table 1.3 indicates the tenets of the ALM. Common types of activities in ALM were memorizing dialogues until the learner achieved perfect pronunciation and intonation, repetition and transformation drills, and application activities (Hadley, 2001, pp. 111-112; Lee & VanPatten, 2003, p. 9; Savignon, 1997, p. 25). The application activities the learner “worked mainly with memorized material, repeating it, manipulating it, or transforming it to meet minimal communicative needs” (Hadley, 2001, p. 112).

Table 1.3 Tenets of the Audiolingual Methodology (Savignon, 1997, pp. 25-26)

Num	Tenets
1	Language learning is habit formation.
2	Language performance consists of four basic skills: listening, speaking, reading and writing.
3	L2 learning, like L1 learning, should begin with listening and speaking, regardless of the end goal of the learner.
4	A contrastive analysis of the phonological and structural differences between L1 and L2 provides the most effective basis for materials development and sequence.
5	The basic unit practice should always be a complete structure. Production should proceed from repetition to substitution and continue until responses are automatic. Spontaneous expression should be delayed until the more advanced levels of instruction. Production errors in structural or phonological features mean that the patterns have not received sufficient prior drilling.
6	The teacher is the center of all classroom activity and is responsible for maintaining attention and a lively pace.

Communicative Language Teaching

Communicative Language Teaching (CLT) developed in the 1970s as a reaction to and a rejection of the ALM that had been popular from the 1940s through the 1960s. Table 1.4 lists the principle tenets of CLT. This approach to language teaching is more student-centered than the ALM. The types of activities that fit into the CLT approach are interactive language games including simulations and role-plays, information sharing activities, task-based activities, social interaction, and functional communication practice (Hadley, 2001, p 117).

Table 1.4 Tenets of Communicative Language Teaching (Savignon, 1997, pp. 28-29)

Num	Tenets
1	Language use is creative. Learners use whatever knowledge they have of a language system to express their meaning in an infinite variety of ways.
2	Language use consists of many abilities in a broad communicative framework. The nature of the particular abilities needed is dependent on the roles of the participants, the situation and the goal of the interaction.
3	L2 learning, like L1 learning, begins with the needs and interests of the learner.
4	An analysis of learner needs and interests provides the most effective basis for materials development.
5	The basic unit of practice should always be a text or a chunk of discourse. Production should begin with the conveyance of meaning. Formal accuracy in the beginning stages should be neither required nor expected.
6	The teacher assumes a variety of roles to permit learner participation in a wide range of communicative situations.

Total Physical Response

James J. Asher developed Total Physical Response (TPR) in the early 1970s. Hadley indicates that Asher based this approach:

on the belief that listening comprehension should be developed fully, as it is with children learning their native language, before any active oral participation from students is expected. Further, it is based on the belief that skills can be more rapidly assimilated if the teacher appeals to the students' kinesthetic-sensory system. (2001, p. 118)

Learners doing TPR activities carry out actions as directed by the instructor's oral commands to show their language comprehension. After an initial period of listening and acting, the instructor encourages the learners to give commands when they are ready. The teacher and learners repeat the sequence of listening and then producing with increasingly complex material. As the class advances, learners prepare and perform skits and problem solving situations (pp. 117-118).

Learning Styles and Strategies

In the late 1980s and early 1990s, learning styles and strategies became increasingly important in educational planning. Hadley notes that before this time period, "conventional wisdom...[was] that second-language acquisition theories should attempt to explain how 'the learner' develops competence, as though learners were a relatively homogenous lot" (2001, p. 75). Learning styles (LSs) are "the general approaches students use to learn any subject,

including a second language” (Oxford, Ehrman & Lavine, 1991, as cited in Oxford & Ehrman, 1993, p. 196). Ls have dimensions such as sensory preference(s), intuitive vs. sensing, and global vs. analytic.

Oxford (1993) defines learning strategies as being “more specific than learning styles. Strategies are the particular behaviors that learners employ, usually intentionally, to enhance their understanding, storage, retrieval, and ultimate use of information” (Riney, 1978, as cited in Oxford, 1993, p. 65). In SLA, “examples include note-taking, seeking conversation partners, developing empathy with the target culture, skimming, previewing, and guessing to understand what is read or heard.” (p. 65). More than one strategy can map to a particular LS. Appendix C gives more examples of learning strategies.

Constructivism

In 1954, Piaget became the first constructivist when he wrote The Construction of Reality in the Child, a book in which he depicts a child as a scientist constructing meaning from the surrounding environment (Oxford, 1997, p. 39). Constructivism, however, remained an obscure philosophy until the 1990s when it became part of the movement for active and experiential learning. This movement is against teacher-centered classrooms and the lecture-plus multiple-choice tests structure of education (p. 46).

There are two general schools of constructivism: “those considering...the knowledge constructor to be the individual...and those viewing the...knowledge constructor as the whole society or group or as the individual as firmly embedded in the group” (p. 45). Independent of these schools of thought:

constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences. (On Purpose Associates, 2001)

Cognitive Map

I use the term “cognitive map” in this thesis to refer to a written visualization of how items such as concepts, ideas, pictures, and grammar items connect or relate to one another. Concept maps, webs, and idea maps are specific examples of cognitive maps. See Table 1.5 for more information.

Table 1.5 Common Cognitive Maps (Inspiration Software Inc, 2008a, 2008b, 2008c)

Cognitive Maps	Description
Concept map	Two or more concepts are linked by words that describe their relationship
Webs	Webs are visual maps that show how different categories of information relate to one another. Webs provide structure for ideas and facts and give students a flexible framework for organizing and prioritizing information.
Idea maps	Idea maps help students brainstorm, solve problems and plan their work. Using word and idea association, idea maps connect keywords, symbols, colors and graphics to form nonlinear networks of potential ideas and thoughts.

Evolution of Language Pedagogy

Table 1.6 presents a brief history of language pedagogy. To make a clear sketch, I have included the approaches, methodologies, and concepts that researchers and professionals stressed during each period. The items that appear in each period may or may not extend into subsequent periods. The time-periods represent approximately when the items became popular as indicated by the sources listed in the table’s caption.

Table 1.6 History of Language Learning (Hadley, 2001; Larsen, 1987; Oxford & Madeleine, 1993; Oxford, 1997; Wang & University of Central Florida, 2005)

Year Range	Methods, Concepts, Approaches Emphasized
<=1960s	Behaviorism, Grammar-Translation method, Audiolingual Methodology, drills
1970s	Communicative competency, Communicative Language Teaching, TPR, how to correct errors, contextualizing language learning
Mid 1980s	Teaching grammar in meaningful context, oral proficiency, structure drills so that they approximate normal exchange, comprehensible input, role of input and output, tasks
Late 1980s & Early 1990s	Communicativeness, interaction, learning styles and strategies, cooperative learning, multi-modal lessons
Mid 1990s & Late 1990s	Teacher as a facilitator, scaffolding, constructivism, how to focus-on-form & communication
Early 2000s	Constructivism, problem solving, learning as an active and collaborative process

The table (Table 1.6) shows a progression in various language-teaching areas having to do with making language learning more learner-centered. For example, from the 1960s to the early 2000s, there is a shift in the learner's role in the classroom. In the 1960s, language teaching is mainly teacher-centered. The employment of audiolingualism, mechanical drills, and instruction on grammar and translation is evidence of a teacher-centered classroom because the learner is a recipient of the teacher's knowledge (Hadley, 2001). However, in the early 2000s, Table 1.6 indicates that the learner produces and constructs knowledge in the classroom because of movements like CLT and constructivism. One of the principles of constructivism indicates that learners must take an active role in the learning process. Further evidence of the progression from teacher-centeredness to learner-centeredness is exhibited by the emphasis on the communicativeness of lessons, the effects of different error correction methods on learners, comprehensible input, learning styles and strategies, and the teacher as a facilitator after the 1960s. Finally, from the 1960s to the present, Table 1.6 shows that the importance of receiving input in relation to producing output has increased.

Brief History of Technology in the Classroom

Teachers can incorporate many different technologies into current classrooms. Table 1.7 shows a list of most of the technologies available to teachers for their classrooms. The list is in chronological order according to when a particular technology started appearing in classrooms.

The progression of technology shown in Table 1.7 indicates that technology is becoming more learner-centered. I demonstrate this by an analysis of who uses the technology and when that technology is used. For example, teachers use instructional audio cassettes and film projectors during class time. Teachers also create and use transparencies for overhead projectors during class time. The learner does not play a major role in the educational use of technology until audio laboratories become popular. Audio laboratories, however, allow limited oral interaction. When personal computers (PCs) appear in the early 1980s, they increase learner-usage of educational technology, first in laboratories and then in the classroom. The space necessary for desktop systems, however, makes it impractical to have more than a few computers in a classroom. The increasing popularity of PCs means that learners can also use educational technology at home. As time moves forward, technologies such as clickers, digital projectors, laptops, and various handheld devices allow individuals, pairs, groups, and classes to interact

with each other and teachers. Laptops, handheld devices, and tablet PCs also make it possible for learners to transport technology to and from the classroom. Thus, technology has historically been teacher-centered, but recent advances in technology are enabling the teacher to shift the focus to the learner.

Table 1.7 Progression of Classroom Technology (Popham, 1969, pp. 334-35; Fought, 1987; National Education Association, 1992, pp. 53-55; National Education Association, 2001, p. 65; Manuelvuelta, 2006; Enlaces Centro de Educación y Tecnología Chile, 2007; Means, Roschelle, Penuel, Sabelli, & Haertel, 2003; Selene486, 2007)

Year	Technology in the Classroom
2007	<ul style="list-style-type: none"> Tablet PCs in classrooms Students bring their own laptops Handheld devices (e.g. Pocket PC) Electronic “chalk” boards (e.g. Smartboards, Ebeam, Interwrite, etc) Clickers Cellular telephones Laptops for students Laptops for Teachers Digital Projectors ELMOS Desktop computer for teacher
1985	<ul style="list-style-type: none"> Student desktop computers in classrooms Student desktop computers in laboratories Listening Laboratories (cassettes y CDs) Video Cassette Recorders (VCRs) Televisions Transparency projectors Motion picture projector (8mm & 16mm) Film strip projectors with or without audio
1960s	<ul style="list-style-type: none"> Audio cassettes Phonographs

CHAPTER 2 - Definition of Terms and Their Applications to CALL

The history of software developed for language learning as shown in Appendix B reveals an ignorance or misinterpretation of accepted terminology and methodology in the field of language acquisition. As an example, Table 2.1 on the following page shows a set of data from the tables of Appendix B. I based the data on CALL software titles published after the 1970s, so based on the data in Table 1.6 (History of Language Learning) the values of the “Focus on Input: Interactive”, “Communicative”, “Social-Cultural”, “Speaking”, and “The learner needs to learn/understand...” attributes should be higher throughout all the periods. While overall there is consistent improvement, none of the attributes in question are found in 50 percent or more of the CALL software of any period. On the contrary, in P1 and P2, an emphasis on grammar and vocabulary dominates. Additionally, 20 percent of the software titles in P3 were digital versions of grammar workbooks. In P2 and P3, the “Speaking” attribute, at first glance, appears to be a great addition to the troubled mixture, but the technology is applied mainly for learner vs. native voice comparison, which is ALMish. The absence of the “The learner needs to learn/understand...” attribute in the first two periods and the weak emphasis placed on it in P3 is also reminiscent of the repetition drills associated with ALM. Therefore, the majority of the CALL software from 1981 to 2008 is stuck in a quagmire of grammar practice and translation mixed with ALM, the tenets of which do not correspond to those expressed in post 1970s language learning methodology and terminology.

Table 2.1 Overview of the History of CALL Software (info taken from Appendix B)

Attributes	Percentage of Software Titles With the Specified Attribute per Period		
	P1 1981-1988	P2 1988-1996	P3 >1996
“Technified” Work Book	22%	NF	19%
Focus on Input: Interactive	11%	20%	38%
Communicative	11%	NF	44%
Competencies Worked			
Grammar/Vocabulary	83%	70%	31%
Listening Comprehension	6%	30%	69%
Reading	17%	30%	44%
Social-Cultural	6%	NF	13%
Writing	NF	NF	38%
Speaking	NF	<u>20%</u>	<u>44%</u>
Native/Learner	NF	20%	31%
Comparison			
Voice Rec. or	NF	NF	13%
Answer Selection			
via Voice			
The learner needs to learn/understand to complete a task	NF	NF	31%

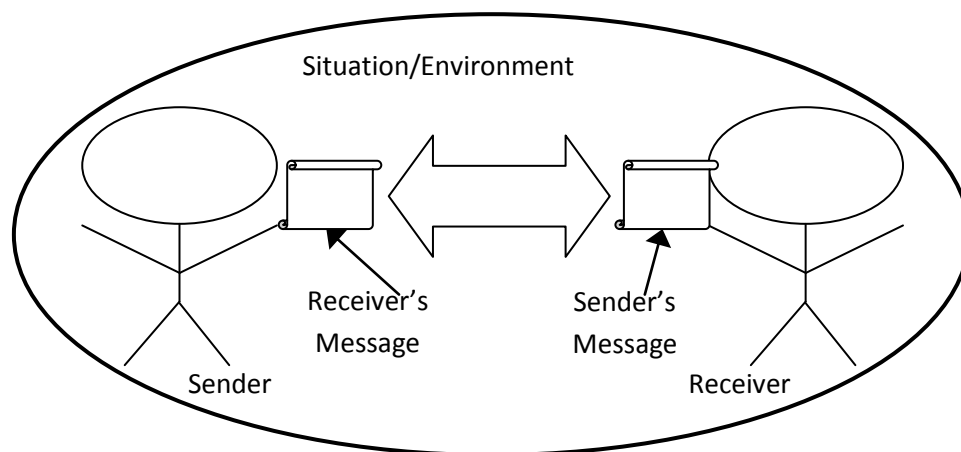
NF: Indicates that no data was found.

The proponents, reviews, and names of CALL software frequently indicate that the product is an interactive software program that provides individualized and personalized language learning. *Enredos Interactivos*, *Pueblo Ingles in Second Life*, *Pasos vivos Español Interactivo 1.01*, *Correct Behavior: The Mexican Way*, and *Spanish Bargaining* are examples of such software. Very few of the programs I found fill the big shoes that their advertising creates. Appendix D indicates the attributes that each of the CALL software programs in the compilation actually have with respect to interaction, individualization, and personalization. All of the programs have parts that fit into the advertised categories, but unlike their use in literature, synecdoches (using a part to describe a whole) do not adequately describe a software program. The advertised characteristics of a language learning software program must be motifs throughout its design and content. Therefore, the following section defines interaction, individualization, and personalization. It also explains how software developers can incorporate them into CALL software programs.

Interaction

In her 1987 book, *Interactive Language Teaching*, Rivers defines interaction as the “...conveying and receiving [of] authentic messages (that is, messages that contain information of interest to speaker [sender] and listener [receiver] in a situation [environment] of importance to both)” (4). Rivers’ definition suggests a basic model of communication (Figure 2.1). Therefore, interaction needs a sender, listener, at least two messages of interest to both parties and at least one channel through which the messages can travel, all of which are located in an environment important to the sender and the receiver. There must be at least two messages because the sender may send a message but not receive anything in return, which is a null message. The plausible situation that, upon perceiving a null message, the sender may resend the original message, redirect the original message, or do nothing confirms that a null message is a valid message. Sending an email is an example of such a situation. When there is no response from the receiver, the sender may send another message, send the message to a different email address or not do anything.

Figure 2.1 Basic Model of Communication



In the computer age, the interactionist approach to language teaching has expanded into the use of CALL software programs. In fact, Carol A. Chapelle, a prolific author on the subject of computer aided language learning (CALL), deals with the topic in her article entitled “Multimedia CALL: Lessons to be learned from research on instructed SLA.” She states, “When addressing applied questions such as design and evaluation of multimedia CALL, it is necessary to select from the many approaches those that are relevant” (21). Her selection of approaches starts at the research level. She categorizes “...approaches to SLA research on the basis of their

interface with teaching...” into three types: coexists, collaborates, and complements. Research into SLA that coexists with language teaching has “little if any intellectual interface” (21). Studies done on the effect that learning a language has on the learner fall into the “coexists” category. Collaborative research occurs when researchers and teachers work together to achieve the same goal in the classroom. An example of this is research into ways to teach communicatively. Research that complements language teaching studies the impact of complementarity, the utilization of “theoretically grounded learning materials and strategies to facilitate L2 learning” in the classroom (22). The supporting research for contextualization of and interaction with language materials falls in this category. Table 1.7 suggests that software is now a complimentary component in the language classroom as many of the technologies listed utilize it. Therefore, Chapelle reasons that the interaction approach is relevant to its design and content.

The interaction approach is different from the human-machine interaction approach inherent in many of the CALL software programs of which I read reviews. The environment in those programs as it pertains to interaction is the content that the software program is showing or has displayed for the user. For instance, if the questions are grammatical in nature, the user commonly conjugates a verb to reflect a certain tense, person, and number dictated by the instructions or by the context given by a few words in the sentence. In both situations, the environmental part of the definition of interaction is only important to the learner because the software already knows the correct answer without consulting the learner or the environment. Additionally, the environment is not important to the software because it usually does not plan on doing anything with the answer except indicating its correctness according to the given instructions. If the answer is correct, the lesson will continue; an incorrect answer will at best trigger an error correction subroutine. Consequently, it is possible for a software program to display information on present tense and then test on the use of preterit tense. Software programs that ignore the environment only test the performance of the learner and do not interact with the learner.

In addition to the importance of the environment (situation) to both sender and receiver, Rivers’ definition of interaction also asserts that the messages exchanged must be of interest to both parties. This role of interest in interaction is not complete, however. Her definition allows the learner not to be interested in his own message. The definition of interaction, therefore,

should specify that both participants are interested in the messages they send and receive respectively. The information in Table 2.2 and Table 2.3 supports this stricter definition. Table 2.2 lists the 16 combinations of a sender and a receiver being interested in the messages they receive and send. Combinations five through sixteen are not valid interaction scenarios according to Rivers' definition because either the sender or the receiver is not interested in the received message. Rivers' definition, however, does accept the first four combinations. They are those in which the sender and receiver are interested in the messages they receive respectively. Her definition, therefore, does not mean that one or both parties must also be interested in the messages they send because combinations two through four permit lack of interest in the message sent. This looseness in the definition allows for breakdowns (items 2-4 in Table 2.2) in the first scenario of Table 2.2, the only truly interactive scenario. Table 2.3 explains possible reasons for the decomposition of the first scenario into items two through four.

Table 2.2 Combinations of Sender and Receiver Interests in the Messages They Send and Receive

	Sender's interest in		Receiver's interest in	
	Own message	Receiver's message	Sender's message	Own message
1	+	+	+	+
2	-	+	+	+
3	+	+	+	-
4	-	+	+	-
5	+	-	+	+
6	-	-	+	+
7	+	+	-	+
8	+	-	-	+
9	-	+	-	+
10	-	-	-	+
11	+	-	+	-
12	-	-	+	-
13	+	+	-	-
14	+	-	-	-
15	-	+	-	-
16	-	-	-	-

Table 2.3 Reasons for the First Through Fourth Interactive Situations in Table 2.2

Situation #	Possible Reasons for the Situations
1	This is the ideal interactive situation.
2	Sender wants the receiver to talk, thinks the receiver is not interested or valuing the message, or wants only to know the right answer from the receiver.
3	Receiver is being rude, lying, tiring of the material, not accounting for learner strategies or styles, or trying to keep the learner talking (ALM or other methods that are output based).
4	This is the worst scenario classifiable under River's definition. Both participants, through a combination of the reasons in situations two and three, have lost interest in the messages they respectively send.

Research on using feedback in language learning also supports the need for the stricter definition of interaction. Similarly to the concept of “importance,” to exhibit “interest” means the sender and receiver must do something with the messages they receive. They must process the received messages in order to respond or give feedback. If a participant does not respond or responds inappropriately as has happened in situations two through four of Table 2.2, the interaction between the participants weakens (decomposes). In the case of interaction in language learning, it is important that participants in interactive activities respond to the content of the messages and not just to its syntax or grammar (Hadley, 2001, p. 263). A language learner may feel overly scrutinized by an inappropriate emphasis on form. Therefore, interacting participants have to process both the form and the meaning of the messages received. Table 2.2, which lists the possible interactive combinations derived from Rivers’ definition, is also useful in explaining why sender and receiver should process both content and form. Assuming that at the start of interaction, the first situation in Table 2.2 is present, the situation becomes a Type 2 situation if the sender loses interest in his own message. Number 2 of Table 2.2 offers some learner perceptions or reasons for a Type 1 to Type 2 situation decomposition. The receiver that pays too much attention to grammar and gives more feedback on it than on the message’s content may generate these perceptions, which lead the sender to stop interacting out of frustration. The reasons in Number 2 of Table 2.2 also indicate that the sender and receiver have taken on roles associated with the Atlas complex as described by Lee and VanPatten (2003, p. 6). The sender-receiver relationship is a generalized version of a teacher-student relationship so the roles of authoritative transmitter and receptive vessel are applicable (pp. 6-7). To maximize language

learning and the learning of other subjects, the communicative approach to SLA advises teachers and, in this case, any interacting participants to avoid Atlas complex roles (Hadley, 2001, p. 95).

Another way for a CALL software program to show that it is interested in the responses that it gives is for CALL software developers to keep learning strategies (LSs) in mind in the design and content of the program. Some authors even suggest that a CALL program should test or inform the learner on LSs (Oxford & Ehrman, 1993, pp.188-190; Ehrman & Oxford, 1990 pp. 312, 323-324). However, there is no agreed upon learning strategies test (i.e. a biographical questionnaire, Modern Language Aptitude Test (MLAT), Motivation and Strategies Questionnaire (MSQ), the Ehrman and Leaver Learning Style Questionnaire (E&L), the Myers-Briggs Type Indicator (MBTI), or the Hartmann Boundary Questionnaire (HBQ)) or even a consensus that one test can accurately inform someone about a person's LSs (Oxford & Ehrman, 1993; Ehrman, 2001; Clark, 2007). In addition, there is no context under which to separately test or teach LSs in a CALL software program. It is a language-learning program, not a self-help program. The key, then, is to keep in mind that using LSs helps generate a positive perception of interest, which decreases the chance of a breakdown in interaction. Consequently, the activities in CALL software should incorporate LSs but not directly teach or test them.

Individualization

Individualization is the changing, modifying, or forming of a resource by an outside force (e.g. teacher, software developer, artisan) to fit the perceived needs, uses, or preferences of an individual. For example, individualized attention describes the modification of the resource "attention" to suit an individual. One-at-a-time access is usually inherent in a system where a one-resource-to-many-individuals relationship and a desire to individualize exist. However, an outside force also individualizes a resource if it is sufficiently efficient at multi-tasking and distributing said resource in the form in which each individual requires and each individual perceives a one-to-one relationship between him or herself and the resource in question. An application server is an example of this preservation of individualization. It allows many users to access a program simultaneously, and each user can operate his program instance as he or she desires. Ideally, the user is unaware of any other individuals operating the same program or accessing other resources on the server.

With CALL, individualization is no longer solely the responsibility of the teacher or curriculum developer. The software developer should provide tools that allow the teacher or learner to replace the outside force (curriculum developer or teacher) traditionally involved in individualization. Additionally, no one has to play the role of an application server trying to fulfill requests. Given the right tools like a content importer, the teacher and the learner can replace individualization with personalization. However, individualization can still occur. For instance, if a teacher were to personalize the software by inserting his or her own, but different, content for each learner, then this would be individualization of the software's content.

Due to the time-consuming nature of individualization even with CALL, differentiation or the modification of design, content, or both for groups of students is more popular and practical. Since the mid 1990s, CALL software developers have typically used two methods to address individualization and differentiation. The first method makes the flow of the program less strict. This approach allows the learner to arrive at the same knowledge through different pathways, branches or tracts. When developers have implemented this well, the pathways are not fixed, so the learner creates or personalizes the path instead of the software dictating it (Hadley, 2001, pp. 163; Fought, 1987).

In addition to tools and designs that allow for multiple tracts, developers integrate tools to take into account learning styles and strategies (LSS). In the CALL software (Appendix A) published before the year 2000, CALL takes an input modality approach to covering LSS. It relies on combinations of text, images, sound, and occasionally videos. This represents a visual, audio, and kinesthetic (VAK) approach to LSS (Clark, 2008). These software programs rely on the "interaction" of typing and mouse clicking to satisfy the kinesthetic part.

After the year 2000, CALL takes a different approach to working with LSS. It starts allowing for memory, cognitive, compensation, meta-cognitive, affective, and social strategies (Ehrman & Oxford, 1990, pp. 314-315). To apply this approach to LSS, software developers include in CALL software tools that allow for content interpretation, control over content, and discovery (Hadley 161-163; Kahn, 1991). Some examples of these tools are note taking features, audio and video control, advanced-feedback, and immersion environments. Note taking allows the learner to personalize and process the content through the learner's schemata. A common feature also in this period is allowing the learner to control (stop, start, pause, and replay) video and sound content, as he or she would be able to do in a non-pedagogical environment.

Advanced feedback points the learner to the section of a video that contains the answer so that the learner discovers the answer instead of being told the answer (Kahn, 1991). Similarly, immersion enables learners to discover through the exploration of a virtual environment.

As CALL software incorporates more of the principles of the communicative and the constructivism movements in language learning, personalization will dominate over individualization. Even though, as my review of the history of CALL software suggests, the evolution of CALL software is slow, it still approximates “the changing goals of language education and the shifting conditions in our postindustrial society” (Wang, 2005, p. 2). Soon CALL software will leave behind the behaviorist approaches and embrace the fact that “Language is a living thing, so the best way to learn a language is in interactive, authentic environments” (1). Humans are famous for personalizing rather than individualizing their environments, so CALL software developers will create more tools to increase the personalization of learning. Individualization will evolve to mean incorporating those tools into a CALL platform to suit different learning styles and strategies.

Personalization

In the concrete business, individualization is constructing the frames, mixing the concrete, and pouring the concrete into the framing. For the average concrete pad, personalization occurs when the owner(s) put their initials, date, hand or foot print into the fresh concrete. The same relationship between individualization and personalization exists with CALL. Individualization tools (ITs) and multiple path designs in the software are how CALL developers individualize the software. Personalization is how much of the teacher, if applicable, and the learner the ITs allow to enter the concrete. In the case of CALL software, the superficial rights of ownership that occur with a normal concrete pad represent a small part of what ITs should allow a teacher and learner to do. ITs should allow the whole teacher and learner to jump into the concrete, inhale it, exhale it, and become part of the product, like an accident while building a dam or a bad date with the Mafia.

With CALL software, there are two types of personalization: teacher and learner. Typically, the learner is the focus of personalization; however, software designers should also give teachers the tools to personalize the software, to change the content and to adjust other features. Teachers need to personalize CALL software in this manner because of evolving

expectations in the field of teaching. Some recent evolutions include placing greater emphasis on differentiation and individualization, changing acceptable methodologies, and emphasizing the use of technology in classrooms.

The greater emphasis on differentiation and individualization has made it important for teachers to be able to personalize CALL software since they know their students better than software developers do. In addition, the characteristics of their students including gender, age, background, interests, and other demographic aspects can change from class to class and from year to year. There is evidence to suggest that male and females may prefer different content. Cultural values and gender roles played by the learners can also affect what content is interesting to the learner (Oxford & Ehrman, 1993). Independent of culture and gender, the age of the learner can affect the material in which the learner is interested and how the teacher should present it (Oxford & Ehrman, 1993; Oxford, 1993; Schleppegrell, 1987; Schulz & Elliott, 2000). Research that supports this also suggests that many classroom activities that involve speed and repetition bias the language classroom against older adults (Schulz & Elliott, 2000).

Another evolution in teaching is the “shift in educational paradigms from a behavioral to a constructivist learning approach” (Wang, 2005). Many teachers no longer view audiolingualistic drills and activities as being as pedagogically sound as they once were. They are replacing mechanical and meaningful drills of traditional instruction as defined by Lee and VanPatten with communicative activities (2003, pp. 120-123). There are many types of communicative activities such as drills, group work, and tasks from which teachers can choose (Hadley, 2001). Within each type, there is an assortment of kinds of activities such as pedagogical and real life tasks (Ellis, 2003, p. 6; Nunan, 2004). Additionally, as constructivism becomes stronger, “the teacher’s role should shift from ‘sage on the stage’ to ‘guide on the side’,” which means teachers will choose activities in which problem solving is the focus and CALL software acts as a facilitator in the process (Wang, 2005, p. 2). The broader range of activities from which a teacher can choose indicates that CALL software that is not personalizable by the teacher may not fit as a facilitator in the changing style(s) of many teachers. This is especially evident given the rapid technological growth towards more student-centered devices suggested by Table 1.7 and surveys done by the National Education Association (1992, 2001). Devices such as electronic dry erase boards, digital projectors, laptops, and tablet PCs favor the changing teacher-student paradigm, but CALL software that is not personalizable

resists being taken out of the fixed environment of the language laboratory and used in the dynamic environment of teaching.

As the communicative and constructivist movements take hold and evolve in the teaching field, the vision of the ideal environment for language learning evolves. Currently, “the best way to learn a language is in interactive, authentic environments” because language is viewed as a living thing (Wang, 2005, p. 2). For CALL software, the authenticity requirement means that the learner has to be present in the environment in order to receive the maximum benefit. Using the concrete analogy, the accident while building the dam and the bad encounter with the Mafia would not have the same affect if the learner watched it on television as it would if the learner participated in the ordeals. This is because while participating in a situation the learner applies three systems to personalize it: the learner’s mind, social awareness and input processing system. For example, in the concrete analogy, the learner might be thinking that he or she does not like the feeling of half-dried blood on his or her arms, wondering what his or her mother will think and trying to decode what the person with the accent is saying. Since participation involves personalization by the learner’s mind, social awareness, and input processing system, CALL software should incorporate these systems into itself to create the affect of participation.

The aspects of the learner’s mind that are especially valuable to CALL software are the learner’s preferences, previous knowledge, and output (PPkO). These are important because “Learning is an active process,” and “Learning is a natural, integral, and ubiquitous part of living; not something handed as a package to somebody else” (Wang, 2005, p. 2). Consequently, the learner must work to learn. Many factors affect whether work or, in this case, learning/acquisition takes place. Some of these factors are motivation, anxiety, and self-esteem (Oxford & Ehrman, 1993; Schulz & Elliott, 2000). Allowing the learner to personalize CALL software with PPkO enhances motivation, lowers anxiety, and improves self-esteem.

According to Oxford and Ehrman, motivation consists of four internal constructs that lead the learner to demonstrate decision-making, persistence, and activity level in a beneficial manner (1993, pp. 190-192). These four internal constructs are interest, relevance, expectancy, and outcomes. Personalization by PPkO enhances motivation because the learner intercalates into the software information that is interesting and relevant to him or herself. This means the learner must instantiate schemata as defined by Hadley in order to relate enough to the content to apply the necessary preferences, background knowledge, and output (2001, pp. 147-149). For

example, when a learner elects preferences like colors, characters, places, and clothing in response to some aspect of a lesson, the selection is based on what is relevant and interesting according to the learner's schemata concerning the lesson's content. Since the learner is now part of the lesson, the experience will be more fun, entertaining, and emotionally involving. Results like the three behavioral attributes I just mentioned help keep the learner's attention and help him or her remember (Kahn, 1991, p. 1144). Consequently, the learner, unknowingly, becomes a source of positive motivation to learn the content.

The third and fourth internal constructs of motivation; that is, expectancy and outcomes, relate closely to anxiety and self-esteem. Expectancy is the belief that a behavior done by oneself will result or not result in some desired outcome(s) (Kelly, n.d.; Oxford & Ehrman, 1993). The "outcomes refer [to] the intrinsic or extrinsic rewards felt by the learner while learning" (Oxford & Ehrman, 1993, pp. 191). These outcomes, which I will call sub-outcomes for clarity, are not limited to the desired outcome(s) set by expectancy. The learner experiences many sub-outcomes during a non-CALL or CALL language lesson. These sub-outcomes include but are not limited to answers to questions both spoken and unspoken, paralinguistic data, and receiving or giving information and feedback. Without personalization by PPkO, the focus of a language lesson is on getting correct answers; therefore, many of the sub-outcomes are of the type right/wrong. Personalization by PPkO shifts the focus of the lesson onto the learner and expressing oneself. The learner's sub-outcome(s), therefore, are of the type successful communication/non-successful communication. These sub-outcomes are more meaningful to the learner and more interactive (using the stricter definition). Thus, as VanPatten suggests, this focus is more congruent with the current input, communicative and constructivist movements in language teaching (1996, p. 59).

Anxiety is a facilitating or debilitating state of apprehension and a vague, sometimes undefined, fear. There are global and situational anxieties (Oxford & Ehrman, 1993, pp. 193-194). Debilitating anxiety can affect motivation by inserting overwhelming fear as an element to overcome when a learner is deciding expectancy. The fear attacks a learner's self-efficacy or "perception of one's own competence" by leading a learner to believe that a behavior or a task is too difficult; thus, a learner may feel a negative expectancy for behavior that would result in the desired outcome(s) (Kelly, n.d.). Facilitating anxiety works on a learner by encouraging

behaviors such as studying, interacting, and asking for assistance in order to enhance the learner's self-efficacy.

Improving self-efficacy is important because it is a component of self-esteem. Self-esteem is a "self-judgment of worth or value based on feelings of '[self-] efficacy'" (Oxford & Ehrman, 1993, p. 194). Like anxiety, self-esteem is global and situational (194). This means that a learner could feel not good at anything, not good at learning a language, or just not good at certain tasks like public speaking.

As was suggested in the section about interest and relevance, personalization by PPkO directs a learner to focus on the input and expression, thereby generating positive sub-outcomes or successes at the start of and throughout a lesson. These small successes can alleviate anxiety and improve low self-esteem in addition to raising interest and relevance levels. Therefore, learners who feel that they are not good at learning languages such as some older adults can benefit from the early success that personalization by PPkO offers (Schleppegrell, 1987).

The generation of successes involves the creation of constructs, form meaning connections (FMCs), or both. According to cognitive and constructivist theories respectively, these are part of how knowledge is acquired (Hadley 2001, p. 70; Lee & VanPatten, 2003, pp. 38-39; Oxford, 1997, pp. 41-43; VanPatten, 1996 p. 10). Apart from creating constructs and FMCs, with CALL software, a learner should utilize these FMCs and constructs to create personal constructions such as stories, comic strips, interviews, songs, and photo sequences. These are concrete representations of the learner's knowledge. The constructions are beneficial to a learner because while the learners are interacting they become comprehensible input anchored in the here-and-now (Lee & VanPatten, 2003, p. 33). A learner can refer back to them in order to assuage debilitating anxiety or boost self-esteem, similar to how teachers utilize the constructions mentioned above to keep input comprehensible, non-confusing, and non-stressful.

The effect that personal constructions can have on self-esteem is described by the theory that self-esteem is affected by where an individual attributes the locus of control to be in a situation (Ehrman & Oxford, 1990, pp. 320-322; Kelly, n.d.). Through personalization by PPkO, the software and any learner constructions contain learner-produced and learner-controlled content, so for the learner, the locus of control of that content is internal. The belief that one's locus of control is at least partially internal helps build at least situational self-esteem through increasing self-efficacy (Oxford & Ehrman, 1993, pp. 194-195).

Constructs and constructions can be social as well as personal (Oxford, 1997). Humans are social animals, so CALL software should allow personalization with social data (SD) in order to allow the learner to put himself fully into the concrete. For example, with personalization by PPkO, a learner could apply a personal construct of cool/not cool to an interesting object. This, according to Kelly's personal construct theory, is the learner giving a personal, idiosyncratic meaning to the encountered object (41). Additionally, as the learner gains more experience and processes the object actively and other objects, he or she will apply more complex and specific constructs to differentiate the object cognitively from other objects and thereby understand it better (42). However, the idiosyncratic meaning the isolated learner develops may not be the final meaning the learner accepts. Prawat suggests with his idea-based social constructivism that the learner is expressing an idea (cool/not cool) about the object created by perceptual schemata and that "an idea continually evolves because of its use in new [social] situations and activities" (43). For instance, the learner's friends may think the same object is gross rather than cool; therefore, the social construct is cool/gross. This social construct could influence the learner because "most learners want to have other people available with whom they can compare their strategies and interpretations..." (Raschio, 1990, p. 539). Consequently, the learner is likely to accept the social construct about the object if he learns negative information about it from his friends. The modification effect on the learner that SD can bring indicates that CALL software should have personalization implemented by SD.

Returning to the concrete metaphor, through the methods of personalization already described, a learner should be able to put him or herself into the concrete. Personalization has made the mixture look appealing and taste appetizing. In addition, when the learner enters the concrete, he or she will not suffer a gag reflex due to stress or anxiety because personalization has made the mixture's temperature acceptable. CALL software should still be prepared for one more type of personalization: input processing (IP). When a learner ingests the concrete (input), the learner must chew it. Chewing is the process of applying teeth (IP behaviors) in order to perceive or notice a form in the input and link it with meaning(s), functions(s), or both. Forms are either lexical like the word "gato" (cat in Spanish) or grammatical like the Spanish verbal inflections -ó/-é (VanPatten, 2004b, pp. 6-7; VanPatten, Williams, & Rott, 2004, pp. 1-4). The connections formed during chewing are form-meaning connections (FMCs). See Table 2.4 for VanPatten's list of theoretical IP behaviors that create FMCs (2004b, pp. 7-18). In Figure 2.2,

VanPatten illustrates how some of these IP behaviors digest input (2004b, p. 144). As Figure 2.2 also shows, the information that IP yields is the intake for the developing system. IP is, therefore, beneficial and necessary so that accommodation and restructuring can occur in the developing system. Accommodation is the inserting of a new FMC into the developing system. Restructuring takes place if an accommodation or a new grammatical awareness causes a cascading effect that changes other elements in the developing system (VanPatten, 2004a, pp. 33-35; VanPatten, 2004b, pp. 25-26; VanPatten et al., 2004, pp. 8-9).

However beneficial and necessary IP is, it does not always process all of the input (modified or not) efficiently and correctly. VanPatten and other authors suggest that working memory capacity, interaction, L1, universal mechanisms like the One-to-One Principle (initially one form is mapped to one meaning) and a universal grammar play a role in IP behaviors and their success (Lightbown, 2004, p. 69; VanPatten, 1996, 2004a, 2004b; VanPatten et al., 2004). VanPatten graphically depicts his ideas about this in Figure 2.2 and Figure 2.3. In essence, the learner's teeth are not always appropriate and perhaps some mechanisms influence them while they discern and connect the forms and meanings in the input. Therefore, the information in the intake is a subset of the information available in the input, and it may not be correct (Lee & VanPatten, 2003, p. 132; VanPatten, 1996, pp. 13-53; VanPatten, 2004a; VanPatten, 2004b, pp. 5-24).

Because it is possible that learner’s existing IP behaviors and other mechanisms “variously support, fail to support, or actively hinder the initial establishment of FMCs,” CALL software should not be created to accommodate these as would be the case if IP was considered under individualization (VanPatten et al., 2004, p. 12). The accommodation of a deficient or harmful IP behavior would limit or impair the success of the learner in learning the L2. Similarly, CALL software programs that ignore the IP of learners would frustrate some learners, as they would never seem to pick up the L2 or understand what they are doing wrong. Only one option remains for CALL software, and that is to attempt to adjust the learner’s IP mechanisms like an orthodontist or dental surgeon adjusts, repairs, or replaces teeth.

Figure 2.2 A Detail of Input Processing (VanPatten, 2004b, pp. 5-31)

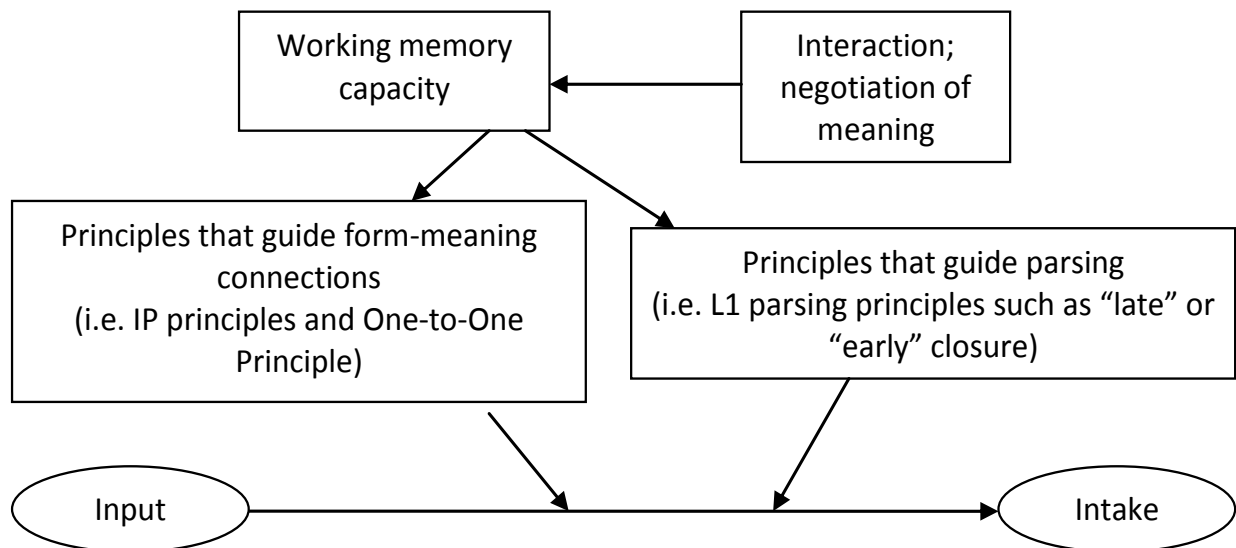
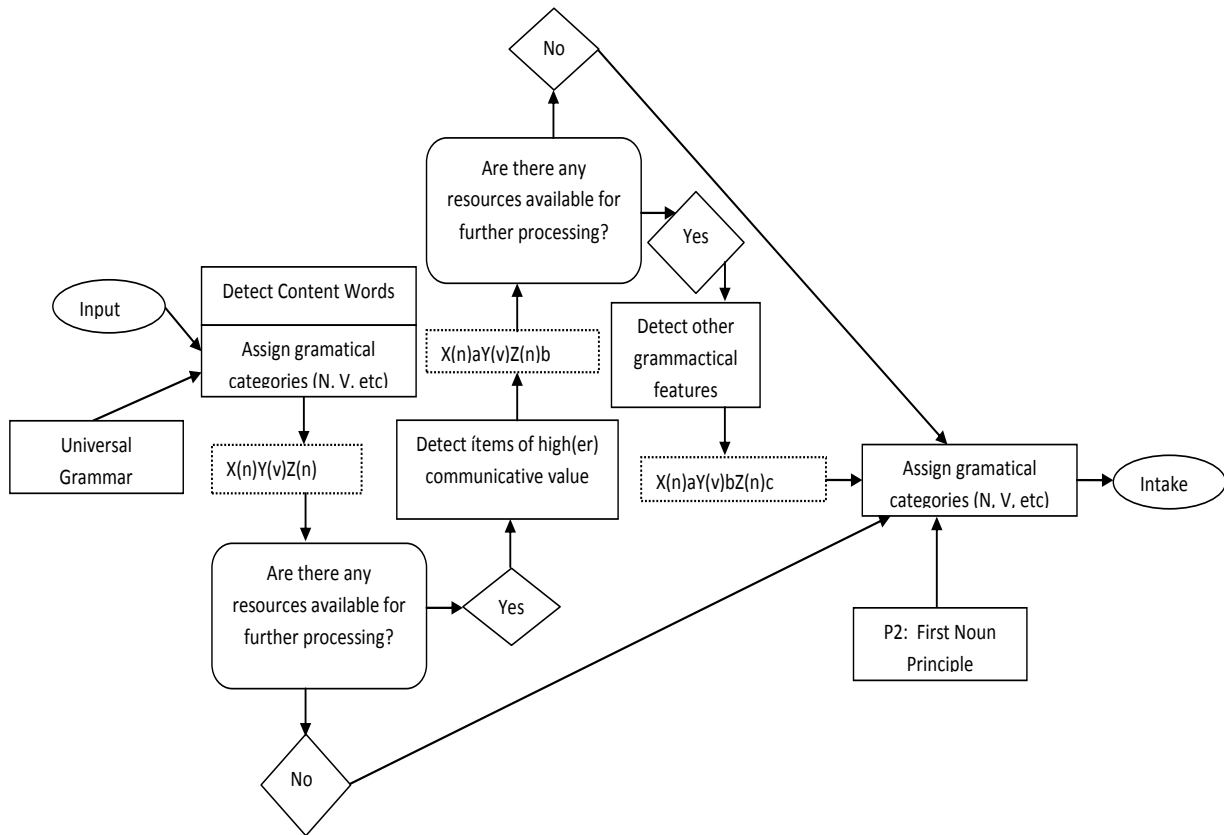


Figure 2.3 An Expanded Model of Second Language Acquisition Showing the Roles of Some Learning Principles and Universal Grammar (VanPatten, 1996, p. 144)



CHAPTER 3 - Software Compilation

CALL software has been produced since at least 1981 when the personal computer was starting to trickle into domestic life from the business world. Technological advances along with the pedagogical advances previously mentioned have occurred since those early PCs and software programs. The advances have broadened and deepened the potential of CALL. How CALL software developers have taken advantages of these advances is a factor that I measure in terms of the breadth, depth and density of the features offered in the software programs. I establish the breadth of CALL software features to fall into the three categories of interaction, individualization, and personalization because, as I have mentioned, these terms are fundamental for teachers and learners. In Tables 3.1, 3.2, 3.3, 3.4 and Appendices B and D, I have compiled and divided the data that I found in reviews of CALL software from 1981 to 2008 into those three categories. These categories existed in all the software that I reviewed. I selected the CALL software for this compilation from reviews in the publications Hispania and the CALICO Journal (The Computer Assisted Language Instruction Consortium). The analysis of the compilation will demonstrate the depth and the density of CALL software and opportunities for change or further development. In the analysis, I define depth as the number of attributes in each range of data. The density of the data is the number of software entries in each attribute or sub-attribute divided by the number of software titles in that range (RE/RT). The ranges are the periods into which I have divided the data. I explain the periods in the following paragraph.

Table 3.1 Overview of the Software Compilation

Row Labels	Entries in Data	Number of Software Titles in each Range	Range Entries (RE) / Range Software Titles (RT)	Percentage of Data Entries	Adjusted # of Entries*	Adjusted Percentage of Data Entries
<1988	140	18	7.78	27.13%	114.10	22.11%
Interaction	73		4.06	52.14%	59.50	52.14%
Individualization	61		3.39	43.57%	49.72	43.57%
Personalization	6		0.33	4.29%	4.89	4.29%
1988-1995	102	10	10.20	19.77%	149.63	29.00%
Interaction	39		3.90	38.24%	57.21	38.24%
Individualization	60		6.00	58.82%	88.02	58.82%
Personalization	3		0.30	2.94%	4.40	2.94%
>1996	274	16	17.13	53.10%	251.22	48.69%
Interaction	115		7.19	41.97%	105.44	41.97%
Individualization	128		8.00	46.72%	117.36	46.72%
Personalization	31		1.94	11.31%	28.42	11.31%
Grand Total	516	44				

***Number of entries if each time period had the same number (44/3) of software titles. The calculation uses the current RE/RT ratio.**

Table 3.1 provides an overview of the interaction, individualization, and personalization categories. I divided the data into three periods according to publishing year of the software. I selected the intervals, <1988, 1988 to 1995, and 1996 to 2008, because they represent important shifts in the personal computer (PC) market. Before 1988, personal computer technology was in its infancy relative to 2008. Many computer brands of this period only supported rough graphic detail with 16 or fewer colors and ran software from cassettes or disks. Software that ran from a hard drive was available towards the end of the period. The Apple I and II, Tandy, Commodore, and Amiga 1000 series were popular machines in this period ("Amiga," 2008; "Apple Inc," 2008; "Commodore 64," 2008; "Commodore 128," 2008; "Commodore Amiga," 2008).

From 1988 to 1995, the personal computer market boomed and the graphic user interface, which both Apple Inc and the Microsoft Corporation had introduced in the previous period, became standard along with software that ran from a hard drive. The common computers of this period were the PS/2, PowerPC, and various PC compatible brands because of IBM's open architecture policy of the previous period ("IBM PC," 2008; "Apple Inc," 2008; "PowerPC," 2008). Despite the boom in the domestic PC market, processor speed, memory capacity, and hard disk capacity were expensive and did not increase greatly.

In the third period, 1996 to 2008, memory and hard drive capacities soared while their prices per unit dropped. Processor chips also experienced a similar increase in capacity and a decrease in their prices per unit because processor manufacturers AMD and the Intel Corporation became involved in a speed war. For example, in 1996 and 2008 the fastest PC processors were 200MHz and 3200MHz (3.2 GHz) respectively while from 1981 to 1995 processor speeds increased from 0 MHz to 200 MHz ("Advanced Micro Devices," 2008; Intel Corporation, 2008; "Intel Pentium," 2008). Various models by Apple Inc and many PC compatible manufacturers were popular in the 3rd period ("IBM PC," 2008; "Apple Inc," 2008; "PowerPC," 2008).

Due to the increased potential of computers in the third period, the compilation should show an increase in the depth and density in all categories for the second and third periods, and the changes should be much more noticeable in the third period. As expected, the "Adjusted Percentage of Data Entries" column of Table 3.1 does show an increase in the total number of data entries for the second and third periods. The seven percent increase that the second period experienced over the first period in total number of data entries is evidence of the slow growth of PC technology from 1981 to 1995. Additionally, because the growth registered in the second period is all in the individualization category, it indicates that the slow technological growth led to an increased emphasis on differentiating software programs by incorporating individualization features. The negative growth exhibited by the interaction and personalization categories in the first and second periods further emphasizes the slow technological growth occurring at that time. In contrast, the 20 percent increase in entries from the second period to the third period is large enough to be consistent with a boom in software potential provided by the explosion in technology during the same period. Perhaps due to pedagogical shifts in the third period, the emphasis on interaction and individualization is more balanced. The extremely small percentage contributed by the personalization column in any period represents an area in need of development. It is especially evident since in the third period there is only an eight percent increase in the importance of personalization. The third period is when the emphasis on the learner and constructivism is the greatest of all three periods.

To highlight the details of the evolution of CALL software and to reveal areas in need of further evolution according to current technology and pedagogy, I performed a more in depth study of the periods and categories previously overviewed. Appendices B and D show the categories and their attributes and sub-attributes into which I sorted the data from each period.

Because I want to emphasize the areas (attributes and sub-attributes) in need of changes, I show those areas in Table 3.2, Table 3.3 and Table 3.4. In each table, I rank the listed attributes and sub-attributes according to how their representation in the third period compares with that of the other periods. Then, based on the influence that pedagogy and technology play in each attribute or sub-attribute, I assigned a reason for each observed evolution. Consequently, each table depicts the evolution and reasons for it of one category from 1981 to 2008.

Table 3.2 shows the under-evolved attributes and sub-attributes of the interaction category. The areas are listed along with their respective rank in the third period (P3) and reasons from Appendix B.

Table 3.2 Comparison of the Interaction Category

Attribute	Rank in P3	Reason for P3 standing
A Technified workbook	Lowest	Inconsistent w/ Pedagogical shifts but revived by Tech Boom
Approach to Focus on Input		
Interactive	Highest	Pedagogical shifts & Tech Boom
Communicative	Highest	Pedagogical shifts
Software or Learner utilizes an avatar or cartoon figure	Only in P3	Tech Boom
The learner needs to learn/understand to complete a task	Only in P3	Pedagogical shifts
Types of Activities		
Binary (i.e. T/F), Matching, & Putting in Order	Highest	Pedagogical shifts
Fill-in-the-blanks	Lowest	Pedagogical shifts
Multiple Options	Middle	Pedagogical shifts
Dialogues	Highest	Tech Boom
Paired conversations	Only in P3	Pedagogical shifts & Tech Boom
Simulations	Highest	Tech Boom
Works on these competencies		
Extra-linguistic	Only in P3	Pedagogical shifts & Tech Boom
Listening comprehension	Highest	Pedagogical shifts & Tech Boom
Reading	Highest	Pedagogical shifts
Socio-cultural	Highest	Pedagogical shifts & Tech Boom
Speaking	Highest	Tech Boom
Writing	Only in P3	Pedagogical shifts

At the top of the list of areas from the interaction category is the attribute “A Technified Workbook.” This means that the software developers for some CALL software programs have converted traditional grammar workbooks into software programs. *Spanish Review, Software for*

Dos Mundos, many implementations using *Blackboard* y *WebCT*, and *QUIA* are some examples of this (Appendix D).

Because interaction should be more than typing and clicking as explained in the interaction section of this paper, CALL software developers should not continue to create “technified” workbooks. The sub-attribute “Interactive” of “Approach to Focus on Input” describes an approach to input that employs technologies and insights from pedagogical research that are more effective.

In step with interaction is the area of making CALL software more communicative. In the stricter definition of interaction, communication plays the role of keeping interacting learners interested in their respective messages, thereby setting the stage to keep everyone interested in the message they receive. The concept of interacting learners is outside the common paradigm of CALL software as is noticeable in both the interaction and individualization categories. Simply stated, the learner using current CALL software has no one with whom to interact and scarcely truly interacts with the computer. The CALL software, *Aprende español con el hijo de Astérix* and *Tesoros: Curso Multimedia Interactivo de Español* made an inroad into this area by having an avatar, or animated character, teach the learner (Appendix D). However, the avatar concept should be further developed to model the current pedagogical ideal of a facilitator and interacting learners (Lonsdale, Graham, & Madsen, 2006, p. 120). This development could also assist in the area of learners needing to learn something to complete a task. *¡A su salud! Spanish for Health Professionals* and *Pueblo Ingles of Second Life* are amongst a few software programs in the reviews that had the learners complete a task that required them to exercise their new knowledge (Appendix D). Developing this area will give learners a reason to learn the information and keep them interested in interacting.

The 16 different activity types that I found throughout the software reviews can help keep learners interested in interacting (Appendix D). Some of the basic activity types like binary (e.g. T/F), fill-in-the-blanks, matching, multiple options, and putting-in-order need further development. In the reviews, these activity type questions were output production or comprehension based. The opportunity, therefore, is to provide more input focused questions, so the learner gains more experience with the covered aspect. This way, more information will make its way into the learner’s intake and then into the developing system. Improving the developing system will help to lessen incorrect output, which as previously discussed, acts to

overcome negative learner characteristics like low motivation, debilitating anxiety, and low self-esteem.

Some more complex activity types like dialogues, paired conversations, and simulations also should be developed more. *Pasos vivos* and *Español Interactivo 1.01* are a couple of the reviewed CALL software programs that use written and oral dialogues to allow learners to pretend they are interacting with people (Appendix D). The dialogues, however, always have only one correct flow, which involves the memorization of a dialogue between native speakers. Current artificial intelligence and voice recognition technologies allow for a less limiting written or verbal interaction. The learner could even direct the conversation based on his/her initiation of the conversation and his/her responses to the intelligent agent's output. CALL software developers could extend this to mimic paired or group conversations. In the reviewed software, paired conversations take place over the telephone or face to face like in *¡A su salud! Spanish for Health Professionals* (Appendix D).

In addition to simulating conversations with artificial intelligences, the learner can now perform both live written and verbal conversations through software and over the Internet. As of 2008, this is even available in the immersion based internet world of *Second Life*. *Second Life* is not strictly a CALL environment, but a multi-purpose, multi-user virtual environment hosted by Linden Research, Inc. on various servers. In this virtual environment, users can create their own avatars and virtual worlds or use ones that already exist, such as *Pueblo Inglés*. Apart from *Second Life*, the few CALL software programs in the reviews that have virtual environments such as *El Mundo Hispanico* and *Un Misterio en Toluca* utilize simpler ones to do simulations (Appendix D). However, *Second Life* reveals that current technologies allow more complex and feature-rich environments and simulations (Linden Research, Inc, 2008).

Despite a variety of activity types, all of the competencies except grammar need to be developed further in CALL software. Very few reviews of the 44 software titles that make up the compilation mention the software program teaching something besides grammar. This may indicate a limitation on the part of both the software and the reviews. In the third period, videos enhance the capability of teaching the socio-cultural and extra-linguistic competencies, but only 2 (*Enredos Interactivos* and *Second Life*) out of 16 software titles intentionally incorporate those competencies in the material and activities (Appendix D). As for the reading and writing competencies, primarily software directed towards intermediate and advanced levels utilized

these competencies (Appendix D). However, given the proper scaffolding such as pre-activities and strategy advice, novice language learners can read and respond to authentic or slightly modified authentic material (Hadley, 2001, p. 188-190, 206-207; Lee & VanPatten, 2003, pp. 223-238). This will allow novice learners to experience connected discourse and invite them to imitate it in their own responses. Due to technology limitations, only the second and third periods address the speaking competency. With the exception of *Second Life*, which is not strictly CALL software, the reviewed software primarily includes the speaking competency through dialogue activities that record and compare learner and native speech samples. *Let's Talk* was the only software program that let the learner verbally interact (not using the strict definition) within the software environment (Appendix D). The learner can verbally choose an answer in multiple-option questions by saying the letter or reading the answer. As indicated in the improving-the-dialogue-activity-type section of this paper, there are many opportunities for development in the speaking competency (Nieves, 1997).

Table 3.3 on the following page shows the under-evolved attributes and sub-attributes of the individualization category. The areas are listed along with their respective rank in the third period and reasons from Appendix B.

The increase in artificial intelligence technology in the second period caused a spike in the indication and location of errors. Later, shifts in pedagogy towards discovery learning decreased interest in this feedback type, thus the third and first periods were the lowest.

The feedback type, “One chance at correct answer,” should occur less while the feedback type, “Permit more than one correct answer,” should be standard. The first type is inconsistent with current movements towards making CALL software more interactive and communicative. Those two movements very seldom involve obtaining a correct answer or at least not a correct answer immediately. They emphasize processing input in order to do something with the information such as making a value judgment for oneself, which inherently has plural correct answers.

I look forward to seeing more feedback types like “Replays the multimedia part with the answer but does not indicate the answer.” This type of feedback is similar to when someone asks for repetition during a conversation, a video or an audio recording. Not only does it imitate a real world event, it also moves feedback into the multimedia era in which “immediacy skill[s]...can be made to resemble the recursive skill[s]...” (Joiner 1997, p. 82, as cited in

Hadley, 2001, p. 179). Typically, the immediacy skills are listening and speaking, and the recursive skills are reading and writing.

Table 3.3 Comparison of the Individualization Category

Attribute	Rank in P3	Reason for P3 standing
Feedback		
Indicates the location of errors (Artificial Intelligence)	Tie p1 for lowest	Pedagogical Shifts & Tech Boom
One chance at correct answer	Tie p1 for highest	Inconsistent w/ Pedagogical Shifts & Tech Boom
Replays the multimedia part with the answer but does not indicate the answer	Only in P3	Tech Boom
Permits more than one right answer	N/A	Inconsistent w/ Pedagogical Shifts & Tech Boom
Immersion (Everything is in L2 and/or realistic environment)	Highest	Pedagogical Shifts & Tech Boom
Involves culture and/or behavior	Highest	Pedagogical Shifts & Tech Boom
Learning Style Dimensions	Highest	Pedagogical Shifts
Learning Strategies (Appendix A)	Highest	Pedagogical Shifts
Modalities involved to create Form-Meaning connections		
TPR	Only in P3	Pedagogical Shifts & Tech Boom
Native vs. Learner voice comparison	Highest	Tech Boom
Offers various learning tracks	Tie p2 for lowest	Inconsistent w/ Pedagogical Shifts and Tech Boom
Pre and/or During activities for listening/reading/writing activities	Lowest	Inconsistent w/ Pedagogical Shifts
Scaffolding (i.e. sentences to connected discourse)	Tie all low	Inconsistent w/ Pedagogical Shifts

As explained in the section on individualization, imbedding tools in CALL software is a way to address learners' learning strategies and learning style dimensions. It is easier to address strategies since there are many style dimensions that map to the same learning strategies. Of the reviewed software only *Let's Practice Spanish*, *Ciberteca: Una carta a Dios*, and *Enredos Interactivos* address learning strategies through tools or otherwise. This number should increase because technology allows the opening of applications such as a note pad with the click of a button. This is also relevant to immersion since the learner often role-plays, explores, or both in a virtual world and needs to find and keep track of linguistic data and other information.

Methodologies not traditionally found in CALL such as Total Physical Response (TPR) should appear more frequently. *Live Action Spanish Interactive* is the only CALL software in

the review that incorporates a non-traditionally-found methodology. It bases its activities on TPR. Therefore, based on the reviews in this compilation, CALL software developers envision the usage of their product as a sit-down-and-be-quiet time for learners. This is inconsistent with oral proficiency and proficiency in the physical (non-verbal) aspects of competencies such as sociolinguistic and strategic (Hadley, 2001, pp. 2-8). Methodologies such as TPR in CALL software can target learning styles and strategies that are more kinesthetic. Additionally, they will enrich the possibilities available to CALL software programs for having the learner respond to information from the input.

As for the “Native vs. Learner voice comparison” attribute, it is possible that comparing learner and native output samples in software programs emphasizes accent, pronunciation and flow more than is pedagogically accepted (Lee & VanPatten, 2003, pp. 9-14). The extra emphasis on imitation may be helpful to learners that want to work on certain linguistic characteristics such as pronunciation and accuracy (Hadley, 2001, p. 112). However, language pedagogy now states that focusing on communication and interaction is more important, not to the detriment of pronunciation and precision but to their enhancement (Lee & VanPatten, 2003, pp. 132-133). Acceptable L2 linguistic characteristics develop over time. Consequently, for CALL software developers, it would be better to emphasize vocabulary development in a communicative context and interaction through artificial intelligence and voice recognition. Interaction can provide the feedback necessary to modify linguistic characteristics such as tone, pronunciation, and flow (31-32,119).

Very few reviews directly or indirectly mentioned scaffolding, the provision of sufficient support structures to promote learning as the learner does the exercises, activities, and tasks the software program presents (Appendix D). Scaffolding should be an essential part of CALL software. Ellis (2003) refers to scaffolding as something that “creates conditions in which learners can develop awareness of new L2 forms and/or actually produce them” (199). VanPatten provides scaffolding in his simple sentence to complex discourse design of structured input. He reasons similarly to Ellis that “learners process input for form only if their processing resources have not been depleted after they have processed the input for meaning” (VanPatten, 2004, p. 38). This means the learner should have the support of experience with simpler discourse when trying to process discourse that is more complex.

Scaffolding is also applicable to listening, reading, and writing activities in the form of pre-activities, during-activities, and post-activities. These activities help prepare and guide the learner while giving a purpose to the activity other than to listen, to read, or to write (Hadley, 2001, pp 184-188, 204-208, 290-296; Lee & VanPatten, 2003, pp. 205-214, 228-240, 247-254). In this compilation, only four of the CALL software programs (*Spanish Microtutor version 2.0*, *Recuerdos de Madrid*, *Enredos Interactivos*, and *¡A su salud! Spanish for Health Professionals*) have pre-activities, during-activities, or both as part of its listening, reading, or writing activities (Appendix D). Post-activities of the comprehension type were common. The Post-activities could help the learner assimilate information as opposed to checking comprehension if pre-activities and during-activities prepared the learner to perform assimilating activities (Lee & VanPatten, 2003, pp. 236-240).

Table 3.4 shows the under-evolved attributes and sub-attributes of the personalization category. These areas are listed along with their respective rank in the third period and reasons from Appendix B.

Table 3.4 Comparison of the Personalization Category

Attribute	Rank in P3	Reason for P3 standing
Incorporates Tasks (Pedagogical or Real)	Highest	Pedagogical Shifts
Learner builds a personal or social construction to benefit him or herself and others (Personal/Social Constructivism)	Only in P3	Pedagogical Shifts & Tech Boom
Learner has options to personalize the software (e.g. options to change types of questions)	Highest	Pedagogical Shifts
Professor can control the content or the visible content	Highest	Pedagogical Shifts
Utilizes preferences, previous knowledge and output in subsequent activities	Only in P3	Pedagogical Shifts

The personalization category provides the most opportunities for improvement. In fact, all of the attributes had low representations in all of the periods. Because of their focus on the learner, the most important are those that develop personal and social constructions and those that propagate user preferences, previous knowledge, and output into subsequent activities.

The appearance in the third period of the idea that the learner can build personal and social constructions shows a pedagogical shift to constructivism and the effects of the internet and social connectionist movements. As indicated by the personalization section of this paper, a CALL software program should allow the user to personalize fully his or her CALL experience. If CALL software designers do not develop these constructivism areas, learners may not truly

incorporate the language into themselves. To the learner, the L2 will remain an academic subject instead of a means of personal expression and social interaction, which for many people extends into personal and social constructions such as Wikipedia.com, Flickr.com, YouTube.com, and blog sites.

Only two software programs (*Pasos vivos* and *Second Life*) out of the 44 I reviewed included the area “utilizing learner preferences, previous knowledge, and output in activities”. There are many possibilities for further development of this area. For example, the software can use the learner to generate content. In addition, the software could modify its own content to match the learner’s needs and motivations.

CHAPTER 4 - “Mis vacaciones” (My CALL Software Program)

Interaction

“Mis vacaciones” addresses some of the under-evolved areas in the interaction category of the compilation. I use an interactive approach to focusing on input that the reviewed software does not frequently incorporate. I base my approach on Processing Instruction (PI), a methodology developed by VanPatten (1996, 2004b; Farley, 2005). In my program when a learner clicks on the UGenio button, structured input (SI) activities appear to assist the learner in acquiring the language needed to perform the task of the selected city. SI activities adjust the input processing strategies of the learner so there is an interaction between the learner and the activity. Another interaction that takes place in “Mis vacaciones” is the use of the learner’s choices within the same activity or in other activities. In this way, it maintains the appearance of being interested in its own output and that of the learner.

“Mis vacaciones” keeps the learner interested in his/her own output by using communicative tasks (CT) and activities. There is an end of game CT, which presents the purpose of the experience. Each destination also has a CT. To start the game, the learner chooses a destination from a map of Mexico and Central America. For this thesis, only the destination of Nuevo Leon, Nicaragua is available. “Mis vacaciones” presents each destination CT to the learner at the entrance to the respective destination. The learner can then decide to do the CT, get help with the CT via SI activities, or go to another destination. In addition to communicative tasks, “Mis vacaciones” incorporates SI activities to further address the communicative deficiency found in the reviewed software (Lee & VanPatten, 2003, pp. 142-165; VanPatten 1996, 2002). There are two categories of SI activities: referential and affective. Referential-SI activities “are those for which there is a right or wrong answer and for which the learner must rely on the targeted grammatical form to get meaning” (Lee & VanPatten, 2003, p. 159). Affective-SI activities differ from referential-SI activities in that they do not have right or wrong answers. Instead, they require learners to express an opinion, belief or some other affective response as they are engaged in processing information about the real world” (Farley, 2005; Lee & VanPatten, 2003, p. 159; VanPatten, 1996; Wong, 2004, pp. 42-45). Affective-SI activities, therefore, are communicative, but both types are meaning based. In its current form,

“Mis vacaciones” has one referential-SI and no affective-SI activities although the underlying structure of the software allows for using affective-SI activities. Future versions will incorporate hybrid-SI activities, which are referential-SI and affective -SI activities. In this type of activity, the learner gives a right or wrong answer (that the software program can check) and responds to an affective question about how the content of the referential part applies to him or herself in order to address communicativeness and personalization.

The use of tasks and SI activities also contributes to another under-evolved area of CALL software: the learner having to learn or understand something to complete an activity. The communicative real world tasks at the city level and at the end of the game require the learner to have understood and learned the presented vocabulary and grammar items. Of course, the software does not force the learner to complete the SI activities if the learner already possesses the required information and completes the tasks. If the learner does the SI activities, these activities keep meaning in focus, which according to VanPatten (1996, 2002) means that the learner “must successfully process the propositional content of the input in order to successfully complete the activity” (Farley, 2005; Wong, 2004, p. 38).

In the area of types of activities, “Mis vacaciones” differs from the reviewed software in two ways. Similarly to the reviewed software SI activities allow the use of binary, fill-in-the-blanks, matching, multiple-option, and putting-in-order questions. The difference between my approach and the reviewed software is that my questions focus on getting meaning from forms rather than testing the comprehension of a sentence or the conjugation of a verb. The learner acquires information rather than being tested. Finally, as part of the interactive focus on input of “Mis vacaciones,” the simulations involved in the software give the learner input from experience instead of from an output-based test.

To contribute to the speaking competency area, “Mis vacaciones” allows the use of speaking in input activities instead of only output activities. SI activities can use speaking as long as the user does not have to use creatively the form-meaning link on which the lesson is concentrating. For example, a learner could read aloud some input to another learner. In this way, some of the SI activities that the learner can do with a partner or group in class are able to improve speaking competency. Depending on the learner, this could be true for individual use as well. The learner can read the input aloud to another learner (the computer) as part of a simulation of pair or group work.

Individualization

Despite the growth exhibited by the individualization category in Table 3.1 from the first period to the second period and its continued strength in the third period, it still has weak areas. “Mis vacaciones” contributes to the strengthening of three of those areas. In the “Feedback” area, current technology allows for many multimedia (video, sound, and images) effects that were not possible before the third period. One in particular stands out for use as feedback. CALL developers can link multimedia or segments of multimedia to sections of activities. Traditionally, CALL software plays the multimedia at the beginning of an activity and then requires the learner to respond afterwards. The feedback for the learner’s responses, typically, has been the same type associated with non-multimedia activities (right, wrong, why, how, and where). “Mis vacaciones” contributes to the small number of CALL software programs using multimedia clips in feedback. The multimedia in the feedback is usually all or part of the multimedia clip on which the software bases the activity. However, the developer could utilize a different multimedia clip in a feedback message if the learner is aware of this practice and the different clip is better suited to allow the learner to notice any errors made in the activity, or to confirm what he or she has learned.

Additionally under the “Feedback” area, a limited number of CALL software programs in the review permitted more than one right answer (Appendix D). This attribute is inherent in the affective type of SI activities since the learner must respond to the question with how the information applies to him or herself. Referential-SI activities can also incorporate questions with multiple answers. The communicative tasks of “Mis vacaciones,” by their nature, allow for more than one right answer.

“Mis vacaciones” strengthens the learning strategies area by including tools that allow the learner to expand beyond the cognitive learning strategy category to which many of the CALL software programs in the review restrain the learner. Appendix C shows diagrams of learning strategy categories, sub-categories, and example strategies (Ehrman & Oxford, 1990). “Mis vacaciones” allows the learner to make use of memory, cognitive, comprehension, meta-cognitive, affective, and social strategies. I list in Table 4.1 the sub-categories that my program allows and the tools that permit their use.

Table 4.1 Learning Strategy Types that My CALL Software Program Allows

Sub-Categories	Tool(s) that allow for strategies of this type
Memory	
Creating mental linkages	SI activities, Cognitive Mapping
Applying images and sounds	Image and Drawing tools
Cognitive	
Practicing Receiving and sending messages	Pair/Group work, Tasks
Analyzing and reasoning	SI activities, Cognitive Mapping
Creating structure for input & output	Pre activities, Cognitive Mapping, Image Tools
Comprehension	
Guessing intelligently	SI activities
Overcoming limitation in speaking and writing	Links to external resources
Meta-cognitive	
Centering your learning	SI activities, Cognitive Mapping
Arranging and planning your learning	Various paths, Scaffolding, Tasks, SI activities
Evaluating your learning	Tasks
Affective	
Lower your anxiety	SI activities
Social	
Cooperating with others	Pair/Group work, Links to external resources
Empathizing with others	Culture of unit, Links to external resources

As mentioned in Table 3.3, my CALL software program also contributes to the areas “various learning tracks” and “scaffolding.” Scaffolding is inherent in SI activities as VanPatten defines them (1996, 2002). One of his guidelines for creating SI activities is moving from simple sentences to connected discourse. Another is focusing on one grammatical form/function at a time (Wong, 2004, p. 38).

Personalization

Personalization is like a third world category, under-privileged when compared to the interaction and individualization categories. “Mis vacaciones” addresses most of the underdeveloped areas in the personalization category. The learner develops his/her own way of completing the tasks in “Mis vacaciones”. The tools mentioned in individualization help the learner prepare for and complete the tasks. For example, the learner could use a cognitive map as a reminder in the end game task, which is to converse with a friend about the virtual vacation the learner took. The cognitive map is also a personal construction, which is another area in need of development. Other personal constructions the learner can make are drawings, images, and sequences of images.

The SI activities have the learner do something with the information gleaned from the input. In fact, one of the guidelines of SI activities is that the learner has to do something with the information from the input (Lee & VanPatten, 2003, p. 158; VanPatten, 1996, 2002; Wong, 2004, p. 40).

“Mis vacaciones” enables the learner and the teacher to do something with its content. They can personalize the software through preferences, previous knowledge, and output. As mentioned before, “Mis vacaciones” demonstrates that the learner’s choices in previous activities can be carried into subsequent activities. Any teacher is also able to upload his/her own content including images and activities. This allows any teacher to modify the program’s content and add additional destinations.

CHAPTER 5 - Conclusion

As has been stated in this paper, CALL software is the weakest link in the language teaching system (LTS) because of its lack of progress in the areas of interaction, individualization, and personalization. Making the improvements in these areas will turn CALL software into a truly interactive, individualized, and personalizable environment. Presently, CALL is like a sandbox with a few tools with which to enjoy the sandbox experience (learning and acquiring). Most of the tools follow old sandbox experience theory. There are some new tools like voice recognition that show promise to break into newer sandbox experience theory. Perhaps the question that needs to be asked is why CALL learners are still playing in a sandbox. Sandboxes and their respective tools are low technological and insufficient solutions. I have shown that technology now exists to reengineer the sandbox, to do away with it. Additionally, as I have shown in this paper, current research into pedagogically well documented concepts like interaction, individualization, and personalization reveals that developers should do much more to enhance the CALL experience.

Instead of a sandbox, I have shown in this paper and with my own CALL software program that CALL should be a three-dimensional wet concrete shape. This concrete playshape should allow the learner to immerse him or herself, swim around, and build deep caverns as well as surface structures. It should allow the learner to sculpt and build constructs and constructions without them losing their shape even when they are dry because the concrete is interested in its response (message) to the learners touch (input). The environment/situation is important to concrete because it needs certain conditions to maintain its properties (interaction). The concrete playshape should also be able to link to the playshapes of friends or strangers (interaction, personalization by social data). There should be tools with which learners can interact with imaginary friends (simulate group/pair work). Learners and teachers (when the concrete playshape is used with supervision), should have tools to change the properties and content of the concrete mix (individualization and personalization). Developers of concrete playshapes should also provide tools for the learner to express different learning styles and to work on a variety of competencies because not all learners are kinesthetic learners (individualization). The concrete playshape should have the learner interact with what he/she has already built while in the process

of playing (learning/acquiring) (personalization by PPkO). Finally, the concrete should have sufficient fortification with nutrients (input processing modification activities) to modify the learners input processing behaviors (personalization by IP) so that the learner can take full advantage of playtime.

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Appendix B - Compilation Data

Table B.1 Interaction Category From All Periods Part 1

Row Labels	Entries in Data	Number of Software Titles in each Range	Range	Percentage	Number of Entries	Adjusted Percentage of Data Entries	Rank Amongst the Three Periods
			Entries (RE) / Range Software Titles (RT)	of Data Entries in respective category	If Each Range had the Same # (44/3) of Titles (using the same RE/RT ratio)		
<1988	140	18	7.78	27.13%	114.10	22.11%	
Interaction	73		4.06	52.14%	59.50	52.14%	
A Technified workbook	4		0.22	5.48%	3.26	5.48%	Highest
	4						
Approach to Focus on Input	2		0.11	2.74%	1.63	2.74%	
Interactive	2		0.11	100.00%	1.63	100.00%	Tie p2 Lowest
Communicative	2		0.11	2.74%	1.63	2.74%	Lowest
	2						
Types of Activities	45		2.50	61.64%	36.68	61.64%	
Binary (i.e. T/F)	2		0.11	4.44%	1.63	4.44%	Tie p2 Lowest
Fill-in-the-blanks	13		0.72	28.89%	10.60	28.89%	Highest
Games and puzzles	5		0.28	11.11%	4.08	11.11%	Tie p3 Highest
Matching	2		0.11	4.44%	1.63	4.44%	Tie p2 Lowest
Multiple Options	11		0.61	24.44%	8.97	24.44%	Highest
Putting in Order	1		0.06	2.22%	0.82	2.22%	Tie p2 Lowest
Short Answer	1		0.06	2.22%	0.82	2.22%	Lowest
Simulations	1		0.06	2.22%	0.82	2.22%	Lowest
Transforming	2		0.11	4.44%	1.63	4.44%	The Only One
Translating	7		0.39	15.56%	5.71	15.56%	Highest
Works on these competencies	20		1.11	27.40%	16.30	27.40%	
General grammar/vocab	15		0.83	75.00%	12.23	75.00%	Highest
Listening comprehension	1		0.06	5.00%	0.82	5.00%	Lowest
Reading	3		0.17	15.00%	2.45	15.00%	Lowest
Socio-cultural	1		0.06	5.00%	0.82	5.00%	Lowest

Table B.2 Interaction Category From All Periods Part 2

Row Labels	Entries in Data	Number of Titles in each Range	Range Number of Entries (RE) / Range Software Titles (RT)	Percentage of Data Entries in respective category	Number of Entries If Each Range had the Same # (44/3) of Titles (using the same RE/RT ratio)	Adjusted Percentage of Data Entries	Rank Amongst the Three Periods
1988-1995	102	10	10.20	19.77%	149.63	29.00%	
Interaction	39		3.90	38.24%	57.21	38.24%	
Approach to Focus on Input	2		0.20	5.13%	2.93	5.13%	
Interactive	2		0.20	100.00%	2.93	100.00%	Tie p1 Lowest
Types of Activities	22		2.20	56.41%	32.27	56.41%	
Binary (i.e. T/F)	1		0.10	4.55%	1.47	4.55%	Tie p1 Lowest
Dialogues	2		0.20	9.09%	2.93	9.09%	Lowest
Fill-in-the-blanks	5		0.50	22.73%	7.34	22.73%	Middle
Games and puzzles	2		0.20	9.09%	2.93	9.09%	Lowest
Listening	2		0.20	9.09%	2.93	9.09%	Lowest
Looking	1		0.10	4.55%	1.47	4.55%	Tie p1 Highest
Matching	1		0.10	4.55%	1.47	4.55%	Tie p1 Lowest
Multiple Options	4		0.40	18.18%	5.87	18.18%	Lowest
Putting in Order	1		0.10	4.55%	1.47	4.55%	Tie p1 Lowest
Short Answer	2		0.20	9.09%	2.93	9.09%	Middle
Translating	1		0.10	4.55%	1.47	4.55%	Lowest
Works on these competencies	15		1.50	38.46%	22.01	38.46%	
General grammar/vocab	7		0.70	46.67%	10.27	46.67%	Middle
Listening comprehension	3		0.30	20.00%	4.40	20.00%	Middle
Reading	3		0.30	20.00%	4.40	20.00%	Middle
Speaking	2		0.20	13.33%	2.93	13.33%	Lowest

Table B.3 Interaction Category From All Periods Part 3

Row Labels	Entries in Data	Number of Software Titles in each Range	Range Entries (RE) / Range Software Titles (RT)	Percentage of Data Entries	Number of Entries If Each Range had the Same # (44/3) of Titles (using the same RE/RT ratio)	Adjusted Percentage of Data Entries	Rank Amongst the Three Periods
>1996	274	16	17.13	53.10%	251.22	48.69%	
Interaction	115		7.19	41.97%	105.44	41.97%	
A Technified workbook	3		0.19	2.61%	2.75	2.61%	Lowest
Approach to Focus on Input	6		0.38	5.22%	5.50	5.22%	
Interactive	6		0.38	100.00%	5.50	100.00%	Highest
Communicative	7		0.44	6.09%	6.42	6.09%	Highest
Software or Learner utilizes an avatar or cartoon figure	2		0.13	1.74%	1.83	1.74%	The Only One
The learner needs to learn/understand to complete a task	5		0.31	4.35%	4.58	4.35%	The Only One
Types of Activities	52		3.25	45.22%	47.68	45.22%	
Binary (i.e. T/F)	3		0.19	5.77%	2.75	5.77%	Highest
Dialogues	3		0.19	5.77%	2.75	5.77%	Highest
Fill-in-the-blanks	6		0.38	11.54%	5.50	11.54%	Lowest
Games and puzzles	4		0.25	7.69%	3.67	7.69%	Tie p1 Highest
Listening	4		0.25	7.69%	3.67	7.69%	Highest
Long Answer	3		0.19	5.77%	2.75	5.77%	The Only One
Looking	1		0.06	1.92%	0.92	1.92%	Tie p2 Highest
Matching	5		0.31	9.62%	4.58	9.62%	Highest
Multiple Options	9		0.56	17.31%	8.25	17.31%	Middle
Paired conversations	1		0.06	1.92%	0.92	1.92%	The Only One
Putting in Order	4		0.25	7.69%	3.67	7.69%	Highest
Search for text with answer	1		0.06	1.92%	0.92	1.92%	The Only One
Short Answer	6		0.38	11.54%	5.50	11.54%	Highest
Simulations	2		0.13	3.85%	1.83	3.85%	Highest
Works on these competencies	40		2.50	34.78%	36.68	34.78%	
Extra-linguistic	2		0.13	5.00%	1.83	5.00%	The Only One
General grammar/vocab	5		0.31	12.50%	4.58	12.50%	Lowest
Listening comprehension	11		0.69	27.50%	10.09	27.50%	Highest
Reading	7		0.44	17.50%	6.42	17.50%	Highest
Socio-cultural	2		0.13	5.00%	1.83	5.00%	Highest
Speaking	7		0.44	17.50%	6.42	17.50%	Highest
Writing	6		0.38	15.00%	5.50	15.00%	The Only One

Table B.4 Individualization Category From All Periods Part 1

Row Labels	Number of Entries in Data	Range Number of Software Titles in each Range	Percentage of Entries (RE) / Range Software Titles (RT)	Percentage of Data Entries in respective category	Number of Entries If Each Range had the Same # (44/3) of Titles (using the same RE/RT ratio)	Adjusted Percentage of Data Entries	Rank Amongst the Three Periods
<1988	140	18	7.78	27.13%	114.10	22.11%	
Individualization	61		3.39	43.57%	49.72	43.57%	
Additional Practice available if student wants/needs	3		0.17	4.92%	2.45	4.92%	Lowest
Approach to Focus on Input	13		0.72	21.31%	10.60	21.31%	
Comprehensible	1		0.06	7.69%	0.82	7.69%	Lowest
Contextualized	8		0.44	61.54%	6.52	61.54%	Lowest
Frequency	1		0.06	7.69%	0.82	7.69%	The Only One
Functional-notional	2		0.11	15.38%	1.63	15.38%	The Only One
Morphological	1		0.06	7.69%	0.82	7.69%	The Only One
Feedback	19		1.06	31.15%	15.49	31.15%	
Automatic Correction	1		0.06	5.26%	0.82	5.26%	Lowest
Detailed feedback; Tells why	2		0.11	10.53%	1.63	10.53%	Highest
General Feedback “Check Spelling” or meta-linguistic feedback	2		0.11	10.53%	1.63	10.53%	Tie p3
Indicates the location of errors (Artificial Intelligence)	1		0.06	5.26%	0.82	5.26%	Tie p3 Lowest
One chance at correct answer	4		0.22	21.05%	3.26	21.05%	Tie p1 Highest
Permits more than one right answer	4		0.22	21.05%	3.26	21.05%	Highest
Score Information (ej. Percent correct)	5		0.28	26.32%	4.08	26.32%	Highest
Involves culture and/or behavior	6		0.33	9.84%	4.89	9.84%	Middle
Learnig Style Dimensions	1		0.06	1.64%	0.82	1.64%	Tie p2 Lowest
Learning Strategies (Apendix C)	1		0.06	1.64%	0.82	1.64%	Lowest
Modalities involved to create Form-Meaning connections	7		0.39	11.48%	5.71	11.48%	
Imágenes	6		0.33	85.71%	4.89	85.71%	Lowest
Sonido	1		0.06	14.29%	0.82	14.29%	Lowest
Offers various learning tracks	9		0.50	14.75%	7.34	14.75%	Highest
Report and/or Management System	1		0.06	1.64%	0.82	1.64%	Tie p2 Lowest
Scaffolding (i.e. sentences to connected discourse)	1		0.06	1.64%	0.82	1.64%	Tie p1,p2,p3

Table B.5 Individualization Category From All Periods Part 2

Row Labels	Entries in Data	Number of Software Titles in each Range	Range Entries (RE) / Range Software Titles (RT)	Percentage of Data Entries in respective category	Number of Entries If Each Range had the Same # (44/3) of Titles (using the same RE/RT ratio)	Adjusted Percentage of Data Entries	Rank Amongst the Three Periods
1988-1995	102	10	10.20	19.77%	149.63	29.00%	
Individualization	60		6.00	58.82%	88.02	58.82%	
Adult learner and learning strategies	2		0.20	3.33%	2.93	3.33%	The Only One
Approach to Focus on Input	8		0.80	13.33%	11.74	13.33%	
Comprehensible	3		0.30	37.50%	4.40	37.50%	Middle
Contextualized	5		0.50	62.50%	7.34	62.50%	Middle
Explanation of grammar in L2	1		0.10	1.67%	1.47	1.67%	Lowest
Feedback	19		1.90	31.67%	27.87	31.67%	
Automatic Correction	6		0.60	31.58%	8.80	31.58%	Highest
Detailed feedback; Tells why	1		0.10	5.26%	1.47	5.26%	Middle
General grammar/vocab	1		0.10	5.26%	1.47	5.26%	Tie p3
Indicates the location of errors (Artificial Intelligence)	3		0.30	15.79%	4.40	15.79%	Highest
No feedback given for wrong answer	1		0.10	5.26%	1.47	5.26%	Tie p3
One chance at correct answer	2		0.20	10.53%	2.93	10.53%	Lowest
Permits more than one right answer	3		0.30	15.79%	4.40	15.79%	Lowest
Score Information (ej. Percent correct)	2		0.20	10.53%	2.93	10.53%	Lowest
Immersion (Everything is in L2 and/or realistic environment)	2		0.20	3.33%	2.93	3.33%	Lowest
Involves culture and/or behavior	1		0.10	1.67%	1.47	1.67%	Lowest
Learnig Style Dimensions	1		0.10	1.67%	1.47	1.67%	Tie p1 Lowest
Modalities involved to create Form-Meaning connections	16		1.60	26.67%	23.47	26.67%	
Imágenes	7		0.70	43.75%	10.27	43.75%	Middle
Sonido	7		0.70	43.75%	10.27	43.75%	Middle
Video	2		0.20	12.50%	2.93	12.50%	Lowest
Native vs Learner voice comparison	2		0.20	3.33%	2.93	3.33%	Lowest
Offers various learning tracks	4		0.40	6.67%	5.87	6.67%	Tie p3 Lowest
Pre and/or During activities for listening/reading/writing activities	2		0.20	3.33%	2.93	3.33%	Highest
Report and/or Management System	1		0.10	1.67%	1.47	1.67%	Tie p1 Lowest

Table B.6 Individualization Category From All Periods Part 3

Row Labels	Entries in Data	Number of Software Titles in each Range	Range Entries (RE) / Range Software Titles (RT)	Percentage of Data Entries in respective category	Number of Entries If Each Range had the Same # (44/3) of Titles (using the same RE/RT ratio)	Adjusted Percentage of Data Entries	Rank Amongst the Three Periods
>1996	274	16	17.13	53.10%	251.22	48.69%	
Individualization	128		8.00	46.72%	117.36	46.72%	
Additional Practice available if student wants/needs	4		0.25	3.13%	3.67	3.13%	Highest
Adult learner and learning strategies	1		0.06	0.78%	0.92	0.78%	The Only One
Approach to Focus on Input	22		1.38	17.19%	20.17	17.19%	
Comprehensible	7		0.44	31.82%	6.42	31.82%	Highest
Contextualized	12		0.75	54.55%	11.00	54.55%	Highest
Input Flooding	1		0.06	4.55%	0.92	4.55%	The Only One
Natural	2		0.13	9.09%	1.83	9.09%	The Only One
Explanation of grammar in L2	3		0.19	2.34%	2.75	2.34%	Highest
Feedback	22		1.38	17.19%	20.17	17.19%	
Automatic Correction	2		0.13	9.09%	1.83	9.09%	Middle
Detailed feedback; Tells why	1		0.06	4.55%	0.92	4.55%	Lowest
Feedback given by instructor	2		0.13	9.09%	1.83	9.09%	The Only One
General Feedback "Check Spelling" or meta-linguistic feedback	2		0.13	9.09%	1.83	9.09%	Tie p1
General grammar/vocab	1		0.06	4.55%	0.92	4.55%	Tie p2
Indicates the location of errors (Artificial Intelligence)	1		0.06	4.55%	0.92	4.55%	Tie p1 Lowest
No feedback given for wrong answer	2		0.13	9.09%	1.83	9.09%	Tie p2
One chance at correct answer	4		0.25	18.18%	3.67	18.18%	Tie p1 Highest
Replays the multimedia part with the answer but does not indicate the answer	3		0.19	13.64%	2.75	13.64%	The Only One
Score Information (ej. Percent correct)	4		0.25	18.18%	3.67	18.18%	Middle
Immersion (Everything is in L2 and/or realistic environment)	4		0.25	3.13%	3.67	3.13%	Highest
Involves culture and/or behavior	8		0.50	6.25%	7.34	6.25%	Highest
Learnig Style Dimensions	4		0.25	3.13%	3.67	3.13%	Highest
Learning Strategies (Apendix A)	2		0.13	1.56%	1.83	1.56%	Highest
Modalities involved to create Form-Meaning connections	36		2.25	28.13%	33.01	28.13%	
Imágenes	11		0.69	30.56%	10.09	30.56%	Highest
Sonido	13		0.81	36.11%	11.92	36.11%	Highest
TPR	1		0.06	2.78%	0.92	2.78%	The Only One
Video	11		0.69	30.56%	10.09	30.56%	Highest
Native vs Learner voice comparison	5		0.31	3.91%	4.58	3.91%	Highest
Offers various learning tracks	6		0.38	4.69%	5.50	4.69%	Tie p2 Lowest
Pre and/or During activities for listening/reading/writing activities	2		0.13	1.56%	1.83	1.56%	Lowest
Report and/or Management System	8		0.50	6.25%	7.34	6.25%	Highest
Scaffolding (i.e. sentences to connected discourse)	1		0.06	0.78%	0.92	0.78%	Tie p1,p2,p3

Table B.7 Personalization Category From All Periods

Row Labels	Number of Entries in Data	Number of Software Titles in each Range	Range Entries (RE) / Range Software Titles (RT)	Percentage of Data Entries	Number of Entries If Each Range had the Same # (44/3) of Titles (using the same RE/RT ratio)	Adjusted Percentage of Data Entries	Rank Amongst the Three Periods
<1988	140	18	7.78	27.13%	114.10	22.11%	
Personalization	6		0.33	4.29%	4.89	4.29%	
Incorporates Tasks (Pedagogical or Real)	1		0.06	16.67%	0.82	16.67%	Lowest
Learner has options to personalize the software (i.e. options to change types of questions)	2		0.11	33.33%	1.63	33.33%	Lowest
Professor can control the content or the visible content	3		0.17	50.00%	2.45	50.00%	Middle
1988-1995	102	10	10.20	19.77%	149.63	29.00%	
Personalization	3		0.30	2.94%	4.40	2.94%	
Learner has options to personalize the software (i.e. options to change types of questions)	2		0.20	66.67%	2.93	66.67%	Middle
Professor can control the content or the visible content	1		0.10	33.33%	1.47	33.33%	Lowest
>1996	274	16	17.13	53.10%	251.22	48.69%	
Personalization	31		1.94	11.31%	28.42	11.31%	
Incorporates Tasks (Pedagogical or Real)	5		0.31	16.13%	4.58	16.13%	Highest
Learner builds a social construction to benefit others (Social Constructivism)	3		0.19	9.68%	2.75	9.68%	The Only One
Learner builds a personal construction (Constructivism)	4		0.25	12.90%	3.67	12.90%	The Only One
Learner does something with the information	5		0.31	16.13%	4.58	16.13%	The Only One
Learner has options to personalize the software (i.e. options to change types of questions)	4		0.25	12.90%	3.67	12.90%	Highest
Professor can control the content or the visible content	8		0.50	25.81%	7.34	25.81%	Highest
Utilizes preferences, previous knowledge and output in subsequent activities	2		0.13	6.45%	1.83	6.45%	The Only One

Appendix C - Learning Strategies Categories

Figure C.1 Oxford's Strategy Classification System Part 1(Ehrman & Oxford, 1990)

FIGURE I

Oxford's Strategy Classification System

Direct Strategies: Memory, Cognitive, and Compensation Strategies

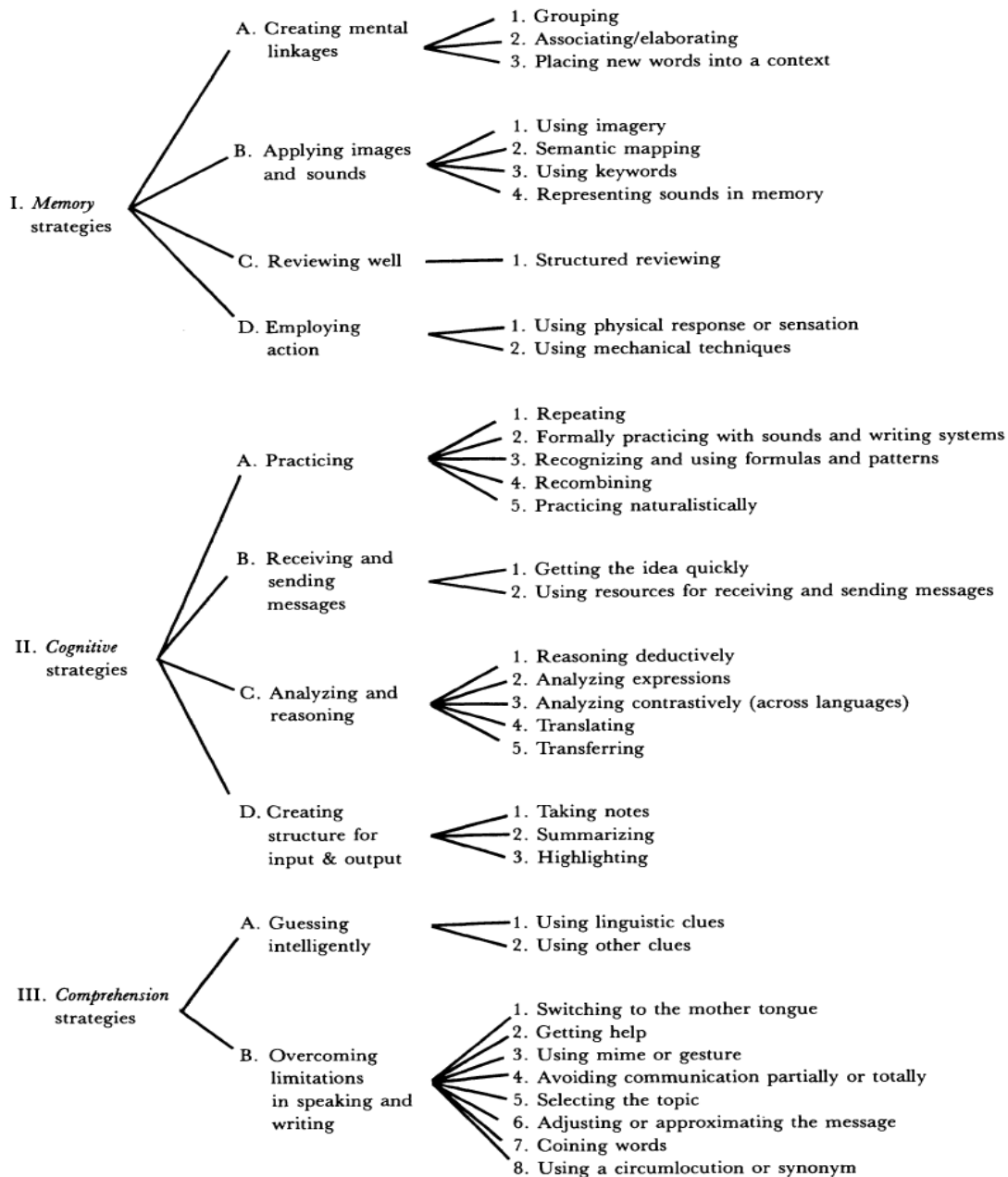
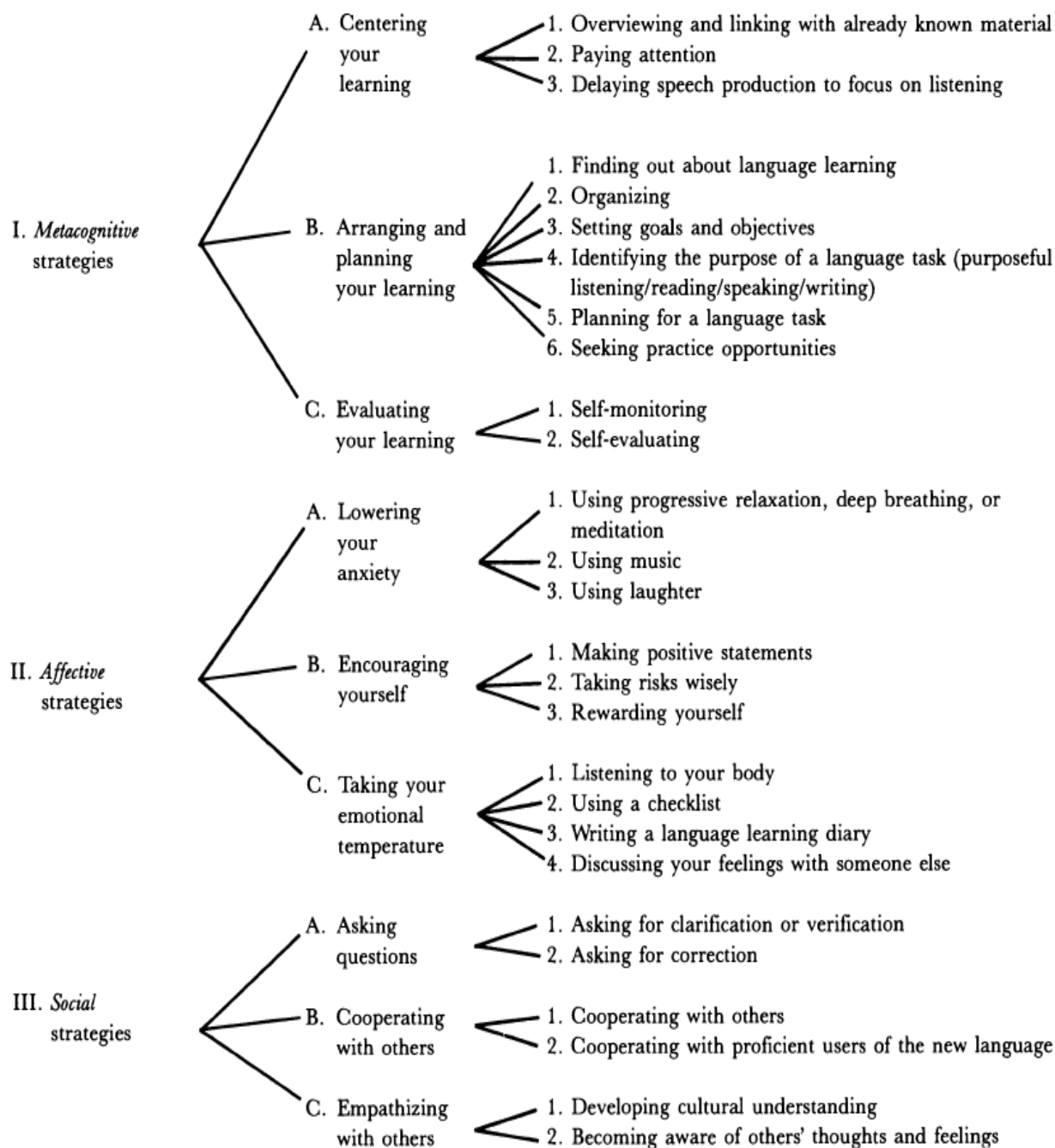


Figure C.2 Oxford's Strategy Classification System Part 2 (Ehrman & Oxford, 1990)

FIGURE I (continued)

Indirect Strategies: Metacognitive, Affective, and Social Strategies



Appendix D - Attributes with Software Titles and Years

Row Labels	Sum of PubYear
Are there trends	
Recommended for what level of proficiency?	
Advanced	
Practicando Español con La Manzana II	1981
El Mundo Hispanico	1985
Recuerdos de Madrid	1991
Ciberteca: Una carta a Dios	1999
Enredos Interactivos	2004
QUIA	2008
Second Life	2008
Intermediate	
Practicando Español con La Manzana II	1981
Spanish Word Order	1983
Batalla de palabras	1984
Lecciones de español conduit	1984
El Mundo Hispanico	1985
Una Visita a México	1985
Computer Exercises for Business Spanish	1987
Juego de pista	1987
Electro-Escuela	1989
Olafo el Terrible	1991
Recuerdos de Madrid	1991
Spanish Microtutor version 2.0	1991
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Un Misterio en Toluca	1999
¡A su salud! Spanish for Health Professionals	2005
Second Life	2008
QUIA	2008
Novice	
Practicando Español con La Manzana II	1981
Spanish for the Traveler	1982
Spanish Word Order	1983
Lecciones de español conduit	1984
Spanish Basic Vocabulary Builder on Computer	1984
Batalla de palabras	1984
Correct Behavior: The Mexican Way	1984
Una Visita a México	1985
Spanish Grammar Computerized, Parts I II	1985
El Mundo Hispanico	1985
Un día típico	1985
¿Habla Español?	1985
Juego de pista	1987

Spanish Review	1987
Software for Churros y Chocolate	1988
Electro-Escuela	1989
Spanish Microtutor version 2.0	1991
Picture It!	1992
En el zoológico	1992
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Tesoros: Curso Multimedia Interactivo de Español	2001
QUIA	2008
Fluenz	2008
Second Life	2008
Individualization	
Additional Practice available if student wants/needs	
Spanish Word Order	1983
Una Visita a México	1985
Un día típico	1985
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Live Action Spanish Interactive	2005
¡A su salud! Spanish for Health Professionals	2005
Adult learner and learning strategies	
EXITO: Survival Spanish	1993
Let's Talk	1995
¡A su salud! Spanish for Health Professionals	2005
Approach to Focus on Input	
Comprehensible	
Let's Practice Spanish	1985
Electro-Escuela	1989
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Software for Dos Mundos	1998
Encuentros en español 1	2000
Enredos Interactivos	2004
¡A su salud! Spanish for Health Professionals	2005
Viaje al pasado: los aztecas	2007
Second Life	2008
Contextualized	
Spanish Bargaining	1983
Batalla de palabras	1984
Correct Behavior: The Mexican Way	1984
El Mundo Hispanico	1985
Una Visita a México	1985
Let's Practice Spanish	1985
Un día típico	1985
Spanish Review	1987
Electro-Escuela	1989
Recuerdos de Madrid	1991

En el zoológico	1992
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Un Misterio en Toluca	1999
Ciberteca: Una carta a Dios	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
Enredos Interactivos	2004
Live Action Spanish Interactive	2005
¡A su salud! Spanish for Health Professionals	2005
Viaje al pasado: los aztecas	2007
Second Life	2008
Frequency	
Let's Practice Spanish	1985
Functional-notional	
Lecciones de español conduit	1984
Una Visita a México	1985
Input Flooding	
Encuentros en español 1	2000
Morphological	
Practicando Español con La Manzana II	1981
Natural	
Software for Dos Mundos	1998
Second Life	2008
Explanation of grammar in L2	
Electro-Escuela	1989
Tesoros: Curso Multimedia Interactivo de Español	2001
Live Action Spanish Interactive	2005
Viaje al pasado: los aztecas	2007
Feedback	
Automatic Correction	
Un día típico	1985
Electro-Escuela	1989
Olafo el Terrible	1991
Spanish Microtutor version 2.0	1991
Recuerdos de Madrid	1991
Picture It!	1992
EXITO: Survival Spanish	1993
Español Interactivo 1.01	1998
¡A su salud! Spanish for Health Professionals	2005
Detailed feedback; Tells why	
Lecciones de español conduit	1984
Correct Behavior: The Mexican Way	1984
Spanish Microtutor version 2.0	1991
Viaje al pasado: los aztecas	2007
Feedback given by instructor	
Un Misterio en Toluca	1999
QUIA	2008

General Feedback “Check Spelling” or meta-linguistic feedback	
Spanish Bargaining	1983
Spanish Word Order	1983
Tesoros: Curso Multimedia Interactivo de Español	2001
Live Action Spanish Interactive	2005
General grammar/vocab	
Spanish Microtutor version 2.0	1991
Software for Dos Mundos	1998
Indicates the location of errors (Artificial Intelligence)	
Spanish Grammar Computerized, Parts I II	1985
Software for Churros y Chocolate	1988
Electro-Escuela	1989
¿Cómo se dice?	1990
Tesoros: Curso Multimedia Interactivo de Español	2001
No feedback given for wrong answer	
En el zoológico	1992
Aprende español con el hijo de Astérix	1996
Software for Dos Mundos	1998
One chance at correct answer	
Spanish Basic Vocabulary Builder on Computer	1984
¿Habla Español?	1985
Computer Exercises for Business Spanish	1987
Juego de pista	1987
¿Cómo se dice?	1990
Picture It!	1992
Español Interactivo 1.01	1998
Ciberteca: Una carta a Dios	1999
Viaje al pasado: los aztecas	2007
QUIA	2008
Permits more than one right answer	
Practicando Español con La Manzana II	1981
Spanish Bargaining	1983
Spanish Grammar Computerized, Parts I II	1985
Spanish Review	1987
Software for Churros y Chocolate	1988
Electro-Escuela	1989
Olafo el Terrible	1991
Replays the multimedia part with the answer but does not indicate the answer	
Tesoros: Curso Multimedia Interactivo de Español	2001
Enredos Interactivos	2004
Live Action Spanish Interactive	2005
Score Information (ej. Percent correct)	
Batalla de palabras	1984
Spanish Grammar Computerized, Parts I II	1985
Spanish for Mastery Software	1985
¿Habla Español?	1985
Juego de pista	1987
Software for Churros y Chocolate	1988
Let's Talk	1995
Software for Dos Mundos	1998
Ciberteca: Una carta a Dios	1999
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008

Immersion (Everything is in L2 and/or realistic environment)	
Electro-Escuela	1989
En el zoológico	1992
Pasos vivos	1997
Un Misterio en Toluca	1999
Live Action Spanish Interactive	2005
Second Life	2008
Involves culture and/or behavior	
Spanish Bargaining	1983
Correct Behavior: The Mexican Way	1984
El Mundo Hispanico	1985
¿Habla Español?	1985
Una Visita a México	1985
Juego de pista	1987
Recuerdos de Madrid	1991
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Un Misterio en Toluca	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
Enredos Interactivos	2004
¡A su salud! Spanish for Health Professionals	2005
Viaje al pasado: los aztecas	2007
Second Life	2008
Learnig Style Dimensions	
Lecciones de español conduit	1984
EXITO: Survival Spanish	1993
Español Interactivo 1.01	1998
Ciberteca: Una carta a Dios	1999
Enredos Interactivos	2004
¡A su salud! Spanish for Health Professionals	2005
Learning Strategies (Apendix C)	
Let's Practice Spanish	1985
Ciberteca: Una carta a Dios	1999
Enredos Interactivos	2004
Modalities involved to create Form-Meaning connections	
Imágenes	
Spanish Bargaining	1983
Spanish Basic Vocabulary Builder on Computer	1984
Una Visita a México	1985
El Mundo Hispanico	1985
Un día típico	1985
Juego de pista	1987
Electro-Escuela	1989
Olafo el Terrible	1991
Recuerdos de Madrid	1991
Picture It!	1992
En el zoológico	1992
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Ciberteca: Una carta a Dios	1999

Un Misterio en Toluca	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
Blackboard y WebCT	2001
Live Action Spanish Interactive	2005
Second Life	2008
QUIA	2008
Sonido	
Spanish for the Traveler	1982
Software for Churros y Chocolate	1988
Electro-Escuela	1989
Recuerdos de Madrid	1991
En el zoológico	1992
Picture It!	1992
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Ciberteca: Una carta a Dios	1999
Un Misterio en Toluca	1999
Blackboard y WebCT	2001
Tesoros: Curso Multimedia Interactivo de Español	2001
Enredos Interactivos	2004
¡A su salud! Spanish for Health Professionals	2005
Live Action Spanish Interactive	2005
Fluenz	2008
Second Life	2008
TPR	
Live Action Spanish Interactive	2005
Video	
EXITO: Survival Spanish	1993
Let's Talk	1995
Pasos vivos	1997
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Ciberteca: Una carta a Dios	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
Blackboard y WebCT	2001
Enredos Interactivos	2004
Live Action Spanish Interactive	2005
¡A su salud! Spanish for Health Professionals	2005
Fluenz	2008
Second Life	2008
Native vs Learner voice comparison	
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Español Interactivo 1.01	1998
Tesoros: Curso Multimedia Interactivo de Español	2001
¡A su salud! Spanish for Health Professionals	2005
Fluenz	2008

Offers various learning tracks	
Spanish for the Traveler	1982
Batalla de palabras	1984
Lecciones de español conduit	1984
Let's Practice Spanish	1985
¿Habla Español?	1985
Un día típico	1985
Una Visita a México	1985
El Mundo Hispanico	1985
Spanish Grammar Computerized, Parts I II	1985
Olafo el Terrible	1991
Spanish Microtutor version 2.0	1991
En el zoológico	1992
EXITO: Survival Spanish	1993
Pasos vivos	1997
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Enredos Interactivos	2004
Second Life	2008
Fluenz	2008
Pre and/or During activities for listening/reading/writing activities	
Spanish Microtutor version 2.0	1991
Recuerdos de Madrid	1991
Enredos Interactivos	2004
¡A su salud! Spanish for Health Professionals	2005
Report and/or Management System	
¿Habla Español?	1985
Spanish Microtutor version 2.0	1991
Pasos vivos	1997
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Ciberteca: Una carta a Dios	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
¡A su salud! Spanish for Health Professionals	2005
Fluenz	2008
QUIA	2008
Scaffolding (i.e. sentences to connected discourse)	
Spanish for the Traveler	1982
Electro-Escuela	1989
¡A su salud! Spanish for Health Professionals	2005

Interaction

A Technified workbook

Spanish for the Traveler	1982
¿Habla Español?	1985
Computer Exercises for Business Spanish	1987
Spanish Review	1987
Software for Dos Mundos	1998
Blackboard y WebCT	2001
QUIA	2008

Approach to Focus on Input

Interactive	
Spanish Bargaining	1983
El Mundo Hispanico	1985
En el zoológico	1992
Let's Talk	1995
Pasos vivos	1997
Español Interactivo 1.01	1998
Un Misterio en Toluca	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
Live Action Spanish Interactive	2005
Second Life	2008

Communicative

Spanish Bargaining	1983
Correct Behavior: The Mexican Way	1984
Pasos vivos	1997
Software for Dos Mundos	1998
Un Misterio en Toluca	1999
Ciberteca: Una carta a Dios	1999
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008
Second Life	2008

Software or Learner utilizes an avatar or cartoon figure

Aprende español con el hijo de Astérix	1996
Tesoros: Curso Multimedia Interactivo de Español	2001

The learner needs to learn/understand to complete a task

Pasos vivos	1997
Software for Dos Mundos	1998
Un Misterio en Toluca	1999
¡A su salud! Spanish for Health Professionals	2005
Second Life	2008

Types of Activities

Binary (i.e. T/F)	
Spanish Word Order	1983
¿Habla Español?	1985
Electro-Escuela	1989
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
QUIA	2008

Dialogues	
Olafo el Terrible	1991
EXITO: Survival Spanish	1993
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Español Interactivo 1.01	1998
Fill-in-the-blanks	
Practicando Español con La Manzana II	1981
Spanish Bargaining	1983
Batalla de palabras	1984
Lecciones de español conduit	1984
Spanish Basic Vocabulary Builder on Computer	1984
Una Visita a México	1985
¿Habla Español?	1985
Let's Practice Spanish	1985
Spanish Grammar Computerized, Parts I II	1985
El Mundo Hispanico	1985
Un día típico	1985
Spanish for Mastery Software	1985
Spanish Review	1987
Software for Churros y Chocolate	1988
Olafo el Terrible	1991
Spanish Microtutor version 2.0	1991
Picture It!	1992
EXITO: Survival Spanish	1993
Pasos vivos	1997
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Tesoros: Curso Multimedia Interactivo de Español	2001
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008
Games and puzzles	
Spanish Bargaining	1983
Batalla de palabras	1984
El Mundo Hispanico	1985
Una Visita a México	1985
Spanish Review	1987
EXITO: Survival Spanish	1993
Let's Talk	1995
Pasos vivos	1997
Español Interactivo 1.01	1998
Viaje al pasado: los aztecas	2007
QUIA	2008
Listening	
¿Cómo se dice?	1990
Let's Talk	1995
Pasos vivos	1997
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
QUIA	2008
Long Answer	
Pasos vivos	1997
Software for Dos Mundos	1998
QUIA	2008

Looking	
Let's Talk	1995
Live Action Spanish Interactive	2005
Matching	
Let's Practice Spanish	1985
Un día típico	1985
En el zoológico	1992
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Tesoros: Curso Multimedia Interactivo de Español	2001
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008
Multiple Opciones	
Spanish for the Traveler	1982
Batalla de palabras	1984
Correct Behavior: The Mexican Way	1984
Lecciones de español conduit	1984
Let's Practice Spanish	1985
¿Habla Español?	1985
Una Visita a México	1985
El Mundo Hispanico	1985
Spanish for Mastery Software	1985
Un día típico	1985
Spanish Grammar Computerized, Parts I II	1985
Recuerdos de Madrid	1991
Picture It!	1992
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Ciberteca: Una carta a Dios	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
Enredos Interactivos	2004
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008
Paired conversations	
¡A su salud! Spanish for Health Professionals	2005
Putting in Order	
Spanish Word Order	1983
Software for Churros y Chocolate	1988
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Tesoros: Curso Multimedia Interactivo de Español	2001
QUIA	2008
Search for text with answer	
Ciberteca: Una carta a Dios	1999
Short Answer	
Computer Exercises for Business Spanish	1987
Electro-Escuela	1989
¿Cómo se dice?	1990
Español Interactivo 1.01	1998
Software for Dos Mundos	1998

Ciberteca: Una carta a Dios	1999
Un Misterio en Toluca	1999
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008
Simulations	
El Mundo Hispanico	1985
Un Misterio en Toluca	1999
¡A su salud! Spanish for Health Professionals	2005
Transforming	
Lecciones de español conduit	1984
Spanish Grammar Computerized, Parts I II	1985
Translating	
Spanish for the Traveler	1982
Batalla de palabras	1984
Lecciones de español conduit	1984
Let's Practice Spanish	1985
Spanish Grammar Computerized, Parts I II	1985
Un día típico	1985
Spanish Review	1987
Software for Churros y Chocolate	1988
Works on these competencies	
Extra-linguistic	
Enredos Interactivos	2004
Second Life	2008
General grammar/vocab	
Practicando Español con La Manzana II	1981
Spanish for the Traveler	1982
Spanish Word Order	1983
Lecciones de español conduit	1984
Spanish Basic Vocabulary Builder on Computer	1984
Batalla de palabras	1984
Una Visita a México	1985
¿Habla Español?	1985
Un día típico	1985
Spanish Grammar Computerized, Parts I II	1985
El Mundo Hispanico	1985
Let's Practice Spanish	1985
Spanish for Mastery Software	1985
Juego de pista	1987
Spanish Review	1987
Software for Churros y Chocolate	1988
Recuerdos de Madrid	1991
Spanish Microtutor version 2.0	1991
En el zoológico	1992
Picture It!	1992
EXITO: Survival Spanish	1993
Let's Talk	1995
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008
Second Life	2008

Listening comprehension	
Spanish for the Traveler	1982
Electro-Escuela	1989
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Tesoros: Curso Multimedia Interactivo de Español	2001
Enredos Interactivos	2004
Live Action Spanish Interactive	2005
¡A su salud! Spanish for Health Professionals	2005
QUIA	2008
Second Life	2008
Fluenz	2008
Reading	
Correct Behavior: The Mexican Way	1984
Let's Practice Spanish	1985
El Mundo Hispanico	1985
Olafo el Terrible	1991
Recuerdos de Madrid	1991
EXITO: Survival Spanish	1993
Software for Dos Mundos	1998
Español Interactivo 1.01	1998
Ciberteca: Una carta a Dios	1999
Un Misterio en Toluca	1999
Tesoros: Curso Multimedia Interactivo de Español	2001
Second Life	2008
QUIA	2008
Socio-cultural	
Correct Behavior: The Mexican Way	1984
Enredos Interactivos	2004
Second Life	2008
Speaking	
EXITO: Survival Spanish	1993
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Pasos vivos	1997
Español Interactivo 1.01	1998
Tesoros: Curso Multimedia Interactivo de Español	2001
¡A su salud! Spanish for Health Professionals	2005
Fluenz	2008
Second Life	2008
Writing	
Español Interactivo 1.01	1998
Software for Dos Mundos	1998
Ciberteca: Una carta a Dios	1999
Un Misterio en Toluca	1999
QUIA	2008
Second Life	2008

Personalization

Incorporates Tasks (Pedagogical or Real)

Spanish Bargaining	1983
Pasos vivos	1997
Un Misterio en Toluca	1999
Encuentros en español 1	2000
Viaje al pasado: los aztecas	2007
Second Life	2008

Learner builds a (social) construcción to benefit others (Social Constructivism)

Un Misterio en Toluca	1999
Ciberteca: Una carta a Dios	1999
Second Life	2008

Learner builds a personal construcción (Constructivism)

Pasos vivos	1997
Español Interactivo 1.01	1998
Ciberteca: Una carta a Dios	1999
Second Life	2008

Learner does something with the information

Un Misterio en Toluca	1999
Blackboard y WebCT	2001
Live Action Spanish Interactive	2005
QUIA	2008
Second Life	2008

Learner has options to personalize the software (i.e. options to change types of questions)

Practicando Español con La Manzana II	1981
¿Habla Español?	1985
Electro-Escuela	1989
Let's Talk	1995
Aprende español con el hijo de Astérix	1996
Español Interactivo 1.01	1998
Ciberteca: Una carta a Dios	1999
Second Life	2008

Professor can control the content or the visible content

Practicando Español con La Manzana II	1981
Batalla de palabras	1984
Computer Exercises for Business Spanish	1987
Picture It!	1992
Pasos vivos	1997
Un Misterio en Toluca	1999
Ciberteca: Una carta a Dios	1999
Encuentros en español 1	2000
Blackboard y WebCT	2001
Fluenz	2008
Second Life	2008
QUIA	2008


Utilizes preferences, previous knowledge and output in subsequent activities

Pasos vivos	1997
Second Life	2008

Appendix E - Instructions for “Mis vacaciones”








1) The “Mis vacaciones.exe” file looks similar to the one in Figure E.1. It is a self-extracting compressed file, which was compressed by WinRAR 3.71. Double click on the file to start the self-extraction. If the self-extraction process asks what directory in which to install the files, please indicate the desired directory.

Figure E.1 A View of the “Mis vacaciones” Self-Extracting file

Name	Date modified	Type	Size	Tags
 MisVacaciones20090107131211	1/7/2009 1:12 PM	Application	8,446 KB	

2) After the self-extraction process, the install directory will have the files and directories indicated in Figure E.2 in addition to any pre-existing files and directories.

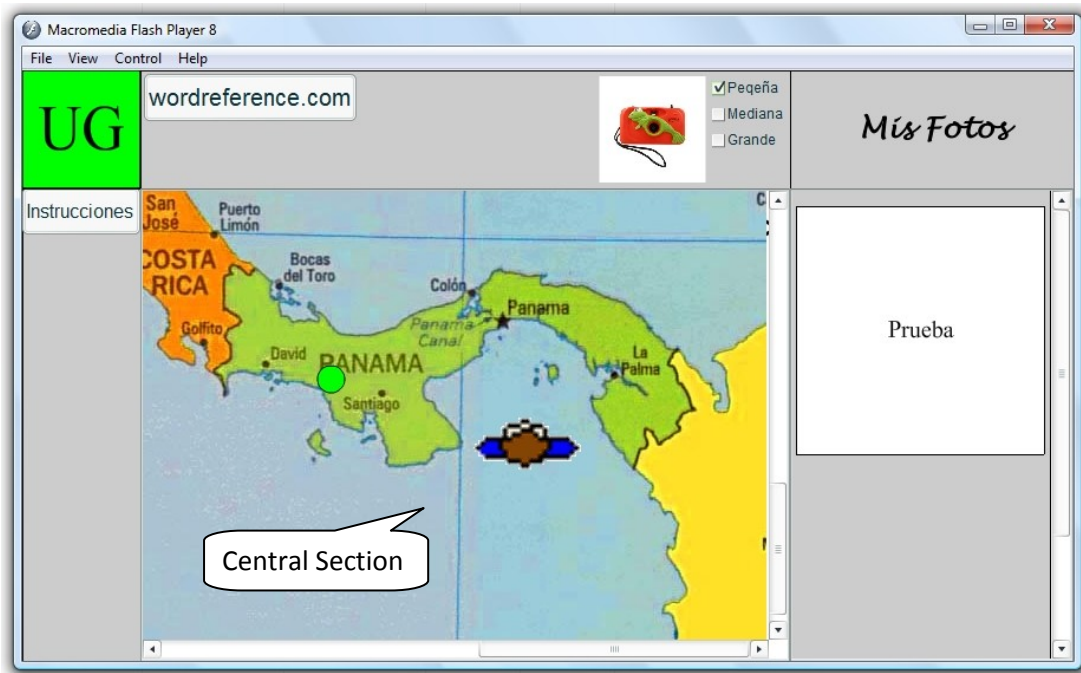
Figure E.2 A View of the Files and Directories that the Self-Executable Installs

Name	Date modified	Type	Size	Tags
 FotosNic	1/7/2009 12:10 PM	File Folder		
 SwfsNic	1/7/2009 1:09 PM	File Folder		
 forBlankUrl	1/4/2009 9:28 PM	JPEG Image	5 KB	
 Mis_vacaciones	1/7/2009 3:18 PM	Application	1,803 KB	
 MisVacaciones20090108120737	1/8/2009 12:07 PM	Application	8,446 KB	
 MyMediaDistribuidora	1/7/2009 3:52 PM	SWF File	258 KB	
 slideshow_r	1/8/2009 11:08 AM	XML Document	23 KB	

3) With the mouse, double click on the “Mis_Vacaciones” application file (Mis_Vacaciones.exe). Figure E.2 has this file highlighted in blue.

4) After double clicking on the application file, the “Mis vacaciones” main screen (Figure E.3) appears.

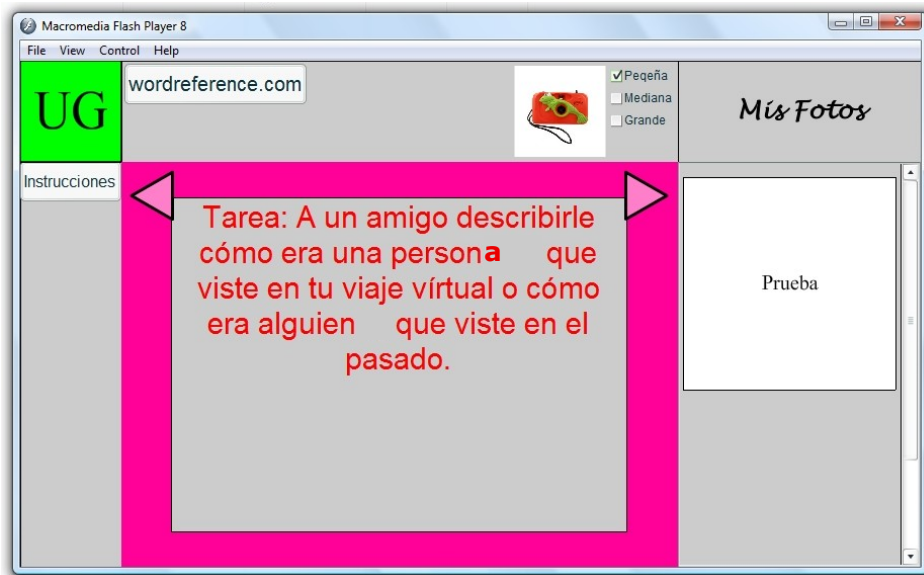
Figure E.3 The Main Screen of “Mis vacaciones”



5) The central section of the main screen (Figure E.3) initially contains a map of Central America, a movable character, and one or more green dots. To go to a location, click on the location’s green dot. This allows a user to select his or her learning path. A teacher can visit select locations and differentiate or individualize the lesson by charting certain paths during class time. The user can modify the xml document (slideshow_r.xml shown in Figure E.2) that controls what locations “Mis vacaciones” offers.

When the user clicks on a location (green dot), the main section will show the task(s) designated by the xml document. Figure E.4 shows the task for Nuevo León de León, Nicaragua. To go to the next frame, the user can click on the forward arrow in the upper right corner of the main section. The next frame could be another task. The option of offering more than one task provides another opportunity for differentiation and/or individualization. To review previous frames, the user can click on the backward arrow in the upper left corner.

Figure E.4 A View of the Task for Nuevo León de León, Nicaragua



6) After the Nuevo León task section, the software informs the user of the built in camera feature that is available by clicking on the picture of a camera in the central part of the header section above the main section (Figure E.5). The camera feature allows the user to personalize the CALL lesson by taking pictures of the parts of the lesson that he or she likes or has found useful for completing the task(s). This may lead the user to form a personal construction like a picture dictionary with the photos. Personal constructions are explained in the main section of this document.

Figure E.5 A View of the Introduction of the Camera Feature.

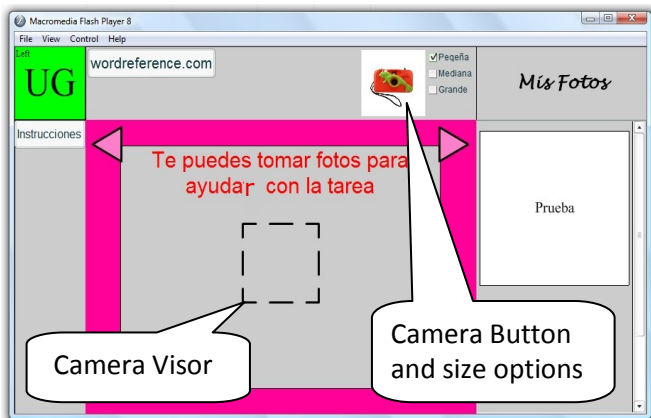


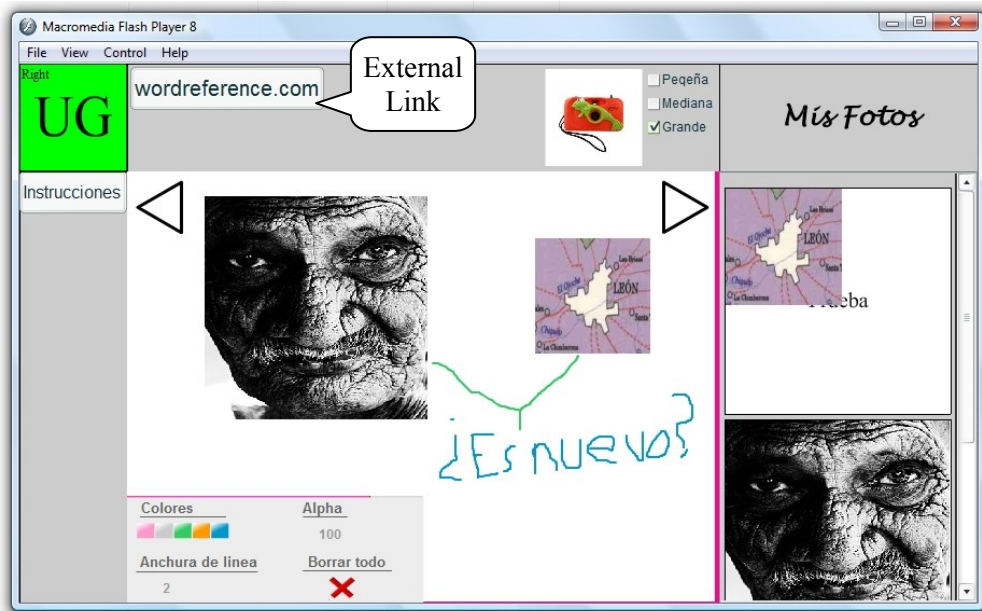
Figure E.5 also shows the camera visor (a black outlined square) that appears when the user activates the camera. The user can move the camera visor left (“a” key), down (“d” key), up (“s” key), and right (“f” key) by pressing the corresponding key of the keyboard. To take a picture, the user clicks on the camera visor. The camera comes with three sizes of visors. The

user selects a different size from the size selectors to the right of the camera button. When the user takes a picture, it will appear in the “Mis Fotos” column to the right of the main section. To deactivate the camera visor, the user clicks on the camera button again.

The task(s) for a location does (do) not have to utilize the camera feature. However, as an example of utilizing the camera feature, the CI section for Nuevo León contains a drawing application (Figure E.6) so that the user can design a caricature while preparing for the task. The drawing and photos are also examples of the user creating personal constructions.

The slideshow_r.xml document (shown in Figure E.2) allows the teacher to link swf files (applications) as well as pictures and text into “Mis vacaciones”. As with the drawing application, when the user encounters applications for photos, the user can drag and drop copies of the photos from the “Mis Fotos” storage section. The user can also move an already-dropped photo by clicking and dragging it again. If the user wants to delete photos from the lesson area, the user should drag and drop them over the “Mis Fotos” storage area.

Figure E.6 The Drawing application in Nuevo León’s Comprehensible Input Section



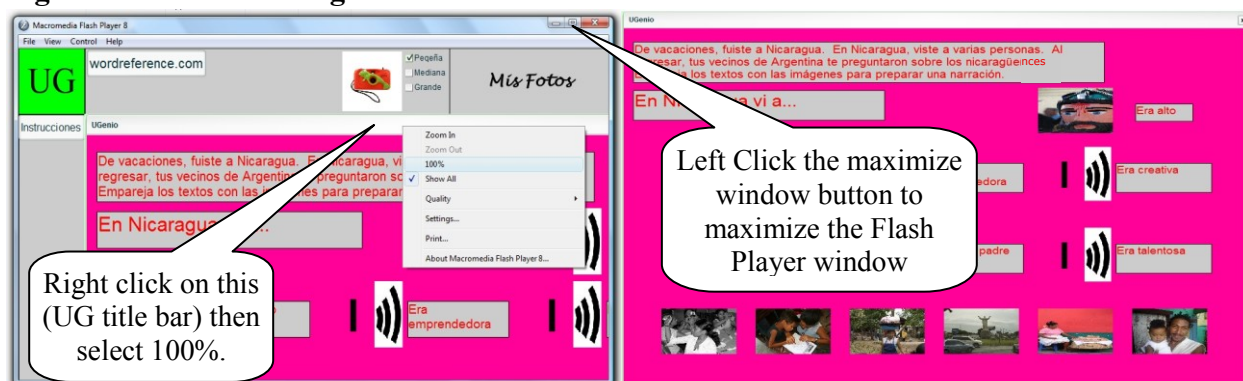
7) Figure E.6 indicates that the main screen also contains a button named “wordreference.com”. This is a link to <http://www.wordreference.com>; a website external to “Mis vacaciones”. The purpose of this link is to show the ability of CALL software to link to external sources in order to provide the user with help. Wordreference.com offers a multilingual dictionary, thesaurus, and language forum with options for pronunciation, image, and contextual output. The user can choose the type of output that they desire. It can provide output in the user’s language (L1) and in the target language (L2). The forum section allows the user to ask questions about the target language using L1 or L2. Responses to questions are from wordreference.com users from around the world. The diversity of the users helps to ensure that the CALL user receives input rich in L2 grammar and socio-cultural usage information. Consequently, by incorporating this external link, “Mis vacaciones” provides the user with multi-modal support and interaction opportunities. Figure E.7 shows what the wordreference.com web page looked like on January 8, 2009.

Figure E.7 WordReference.com on January 8, 2009



8) To the left of the wordreference.com button there is a green button labeled “UG”. This is the “UGenio” help button. The user can click on the UGenio button to receive help on concepts covered in the task or comprehensible input sections. The help is in the form of the structural input (SI) activities, which I describe in the main body of this document. Briefly, SI activities allow the user to discover grammatical concepts through the controlled presentation of input. Figure E.8 shows the process to view the SI activities after clicking on the green UG button. The user may need to adjust the process for the computer running “Mis vacaciones”.

Figure E.8 After clicking on the Green UG button



SI content is available through the UGenio button after the user has clicked on a green button. “Mis Vacaciones” allows the user to control whether he or she does the SI activities in order to work with the user’s learning style(s) and abilities. In addition, the user does not have to do all of the SI activities or even complete an opened activity. A secondary effect of allowing the user these controls is that the user can direct his or her path through the software.

9) Another feature of “Mis vacaciones” is that the user can import tasks, images, texts and swf applications to the sections of the software. The user can also control various attributes of the imported items. To import and control items, the user must modify the slideshow_r.xml file shown in Figure E.2. Tables E.1 and E.2 show examples of the code used in the task, CI and SI sections of “Mis vacaciones”. A brief explanation of the functions of the xml tags and attributes in the code is included in each table.

Table E.1 Xml Code Examples and the Functions of Tags and Attributes for Sections

Task Section

Code for Text

```
<Task1_L1_C1>
  <tTexto1_T1_L1_C1 bkg="forBlankUrl.jpg" attachedTo="T_I1_T1" myText="Tarea: A un
  amigo describirle cómo era una persona que viste en tu viaje virtual o cómo era alguien
  que viste en el pasado." xCord="49" yCord="35" tHeight="330" tWidth="450"
  myTextSize="30" myTextAlign="center" myTextColor="0xFF0000" Tborder="true"
  TbackgroundColor="0xCCCCCC">
  </tTexto1_T1_L1_C1>
</Task1_L1_C1>
```

Functions of Xml Tags and Attributes

<code><Task1_L1_C1></code>	Begins Task # (Task1) of Location # (_L1) of Country # (_C1)
<code><tTexto1_T1_L1_C1</code>	Begins Text # (tTexto1) of Task # (_T1) of Location # (_L1) of Country # (_C1)
<code>bkg="forBlankUrl.jpg"</code>	Defines the background image for the Task frame in which the text appears
<code>attachedTo="T_I1_T1"</code>	(Currently not implemented completely) Defines what section (T) in which the image (_I1) appears with this textbox (_T1)
<code>myText="Tarea: A..."</code>	Defines the text that appears
<code>xCord="49" yCord="35"</code>	Define the position of the textbox within the frame (bkg)
<code>tHeight="330" tWidth="450"</code>	Define the height and width attributes of the textbox
<code>myTextSize="30"</code>	Just like in a word processor program
<code>myTextAlign="center"</code>	
<code>myTextColor="0xFF0000"</code>	
<code>Tborder="true"</code>	Puts a border around the textbox
<code>TbackgroundColor="0xCC CCCC"></code>	Defines the color of the textbox background
<code></tTexto1_T1_L1_C1></code>	End respective sections (see beginning section tags)
<code></Task1_L1_C1></code>	

Comprehensible Input Section

Code for Text

```
<Textos_CI1_L1_C1>
  <texto1_CI1_L1_C1 num="1" tUrl="" attachedTo="C_I1_T1" myText="Puedes
  tomar fotos para ayudarte con la tarea" xCord="49" yCord="35" tHeight="330"
  tWidth="450" myTextSize="30" myTextAlign="center" myTextColor="0xFF0000"
  Tborder="true" TbackgroundColor="0xCCCCCC" response="" />
```

Functions of Xml Tags and Attributes

<code><texto1_CI1_L1_C1</code>	Begins Text # (texto1) of CI section # (_CI1) of Location # (_L1) of Country # (_C1)
<code>num="1"</code>	Always set to the same number as Text #. It has internal processing importance.
<code>tUrl=""</code>	Has not been implemented
<code>attachedTo="C_I1_T1</code>	Defines what section (C) in which the image (_I1) appears with this text (_T1). Image _I1 must exist in the picture section.

Table E.2 Part 2 Xml Code Examples and Functions of Tags and Attributes for Sections

Comprehensible Input Section

Functions of Xml Tags and Attributes Continued from E.1

<code>myText="Puedes..."</code>	Same as in the Text part of the Task section
<code>xCord="49" yCord="35"</code>	Same as in the Text part of the Task section
<code>tHeight="330"</code>	
<code>tWidth="450"</code>	
<code>myTextSize="30"</code>	
<code>myTextAlign="center"</code>	
<code>myTextColor="0xFF0000"</code>	
<code>0" Tborder="true"</code>	
<code>TbackgroundColor="0xC</code>	
<code>CCCCC"</code>	
<code>response=""</code>	Currently not implemented
<code>/></code>	Ends the section (see beginning section tags)

Comprehensible Input Section

Code for Images

```
<Images_CI1_L1_C1>
  <picture1_CI1_L1_C1 pUrl="forBlankUrl.jpg" attachedTo="C_I1" caption=""
  xCord="0" yCord="0" pHeight="400" pWidth="550" rotation="" visible="true"
  response="" />
</Images_CI1_L1_C1>
```

Functions of Xml Tags and Attributes

<code><Images_CI1_L1_C1</code>	Begins Images section of the CI section # (_CI1) of Location # (_L1) of Country # (_C1)
<code><picture1_CI1_L1_C1</code>	Begins picture # of CI section # (_CI1) of Location # (_L1) of Country # (_C1)
<code>pUrl="forBlankUrl.jpg"</code>	The location of the image file relative to the "Mis vacaciones" file. If it is in a different directory than use "/MyDirName/myImageName.***" with as many directory names as needed. Swf applications will use a .swf extension.
<code>attachedTo="C_I1</code>	Defines what section (C) in which the image (_I1) appears.
<code>caption=""</code>	Has not been implemented
<code>xCord="0" yCord="0"</code>	Same as in a word processor
<code>pHeight="400"</code>	
<code>pWidth="550"</code>	
<code>rotation=""</code>	
<code>visible="true"</code>	An image can be made invisible
<code>response=""</code>	Has not been implemented
<code>/></code>	Ends its beginning Tag
<code></Images_CI1_L1_C1></code>	Ends its beginning Tag