

Pérez, Teadira

* La Dra. Pérez es Profesora Asociada de la Escuela de Idiomas Modernos y miembro activo del Centro de Investigaciones en Lenguas Extranjeras (CILE), de la Universidad de Los Andes, Mérida, Venezuela.

Abstract

The purpose of this paper is to present a theoretical discussion of how Computer Assisted Language Learning (CALL) practices need to be informed and supported by Second Language Acquisition (SLA) theories. The first part presents fundamental conceptual issues related to SLA and CALL. The second part offers a review of CALL approaches, moving from behaviourist towards sociocognitive CALL practices. The final section of this paper presents the relationship between SLA and CALL in order to provide a clear view of how both disciplines are blended and how practitioners need to consider both to create pedagogically sound CALL projects.

Where do SLA and CALL meet?

Key words

CALL, SLA, teaching, learning, electronic media

Palabras clave

ALAC, ASL, aprendizaje, enseñanza, medios electrónicos

Resumen

El propósito de este artículo es presentar una discusión teórica de la manera en que las prácticas de Aprendizaje de Lenguas Asistido por el Computador (ALAC) necesitan apoyarse en las teorías de Adquisición de Segundas Lenguas (ASL). La primera parte presenta los conceptos fundamentales relacionados con ASL y ALAC. La segunda parte

ofrece un estudio de los enfoques de ALAC, desde las prácticas conductistas hasta las prácticas sociocognitivas de ALAC. La relación entre ASL y ALAC se presenta en la parte final de este artículo, para mostrar la manera en que estas dos disciplinas están vinculadas y cómo los profesionales que utilicen estos recursos necesitan considerar ambas para crear pedagógicamente proyectos de ALAC.

1. Second language acquisition (SLA)— some fundamental theoretical groundings

Second language acquisition has become the standard term of referring to the study of the processes through which people learn another or other languages in addition to the mother tongue. The term SLA is commonly used after Krashen's (1981) distinction between 'language acquisition' and 'language learning'. According to Krashen (1981) 'language acquisition' involves a subconscious learning process and learners need to be exposed to meaningful interaction and natural language communication in order to convey meaning and infer rules rather than learning structures in a systematic manner. Language learning, instead, is linked to instruction and the mastering of grammatical accurate utterances through error correction. This acquisition-learning distinction contributed to the understanding of how natural learning environments and language use and communication favour second language acquisition, only if exposure is systematic and involve the learner. Nevertheless, classroom teaching can achieve both acquisition and learning by providing learners with authentic and real use of the target language.

The initial theories of SLA were informed by behaviourism during the 1950s and early 1960s. Second language learning resulted from the mastering of structures by imitation and repetition and by continuous practice (Mitchell and Myles, 2004). Influenced by Chomsky's criticism of behaviourist theories of language learning, Krashen developed the input hypothesis during the late 1970's and early 1980s based on the fact that input was

“all necessary for second language acquisition to take place” (Mitchell and Myles, 2004, p. 20). Krashen's (1981) SLA theory became a predominant influence on second language teaching practice. This hypothesis evolved and during the 1980s, Krashen (1981) constructed his theory around five hypotheses: a) the acquisition-learning hypothesis; b) the natural order hypothesis; c) the monitor hypothesis; d) the input hypothesis and the e) the affective filter hypothesis. Based on these five principles, second language classrooms need to focus on activities that foster acquisition without over-emphasising error corrections. In this sense, SLA classrooms need to provide enough language input to make learners use the language and then, “when they have time, when the focus is on form, and when they know the rule” (Krashen and Terrell, 1983, p. 59), consciously use grammar.

Comprehensible input, then, is focused on learners' construction of meaning rather than the study of grammar and vocabulary lists. The study of grammar is not completely excluded from Krashen's comprehensible input hypothesis, grammar explanations to learners come after comprehension has been achieved:

I recommend delaying the teaching of these rules until more advanced levels. I would first give acquisition a chance, and then use conscious knowledge to fill in some of the gaps. There is no sense in teaching rules for monitoring that will eventually be acquired. Grammar, thus, is not excluded. It is, however, no longer the star player but has only a supporting role. (p. 2)

Tutors need to make input comprehensible to learners who in turn notice and understand messages and 'output' is not forced. Structural aspects of the language are learned through use and constant exposure to the target language by making input comprehensible and meaningful to learners. 'Input', then occurs when learners are in direct contact with the language as opposed to 'intake', which refers to the way learners process language which can contribute to learning.

Krashen (1985) postulates that SLA is determined by 'comprehensible input', which claims that language is acquired when learners understand messages. The understanding of these messages is influenced by engaging learners with the material effectively and affectively; by providing an authentic and real context of communication; by making learners interact and by considering learners' needs and different learners' styles. Comprehensible input helps learners to become 'autonomous acquirers'. According to Krashen (2004):

The autonomous acquirer has acquired enough of the second language so that at least some authentic input is comprehensible, enough to ensure progress and the ability to acquire still more language.

The autonomous acquirer will understand the language acquisition process. The autonomous acquirer will know that progress comes from comprehensible input, not from grammar study and vocabulary lists, and will understand ways of making input more comprehensible (e.g., getting background information, avoiding obviously incomprehensible input).
(p. 6)

Comprehensible input, though necessary for SLA, is not enough; there are affective factors which influence learners' readiness to understand messages. Based on Krashen's affective filter hypothesis, a low affective filter – implying low anxiety and high self-confidence – contributes to SLA. The implications of Krashen's theory of SLA on teaching are based on, following the Natural Approach (Krashen and Terrell, 1983), an understanding that comprehension precedes form and that learners need to be allowed a silent period before production takes place.

By considering affect, the Natural Approach concentrates on activities that relieve stress and encourage learners to learn responsibility, negotiation and self-evaluation, which in turn, influence self-esteem and self-awareness (Arnold and Brown, 1999).

The SLA framework was enriched, in the mid-1980s, with cognitive, neuro-psychology and socio-cultural premise of language learning. One of the major criticisms of Chomsky's innate view of language is the fact that language was perceived as a separate element in the mind, isolated from other cognitive processes. Cognitive researchers claim that the way learners process and learn new information based on existing schemes was paramount to SLA. McLaughlin (1987), for instance, argues that language learning is a cognitive process that involves the activation of learners' information through short-term memory mechanisms. At this stage activation is controlled and becomes automatic through repeated activation and when it is stored in the long-term memory. Learning, then, is perceived as:

The movement from controlled to automatic processing via practice (repeated activation). When this shift occurs, controlled processes are freed to deal with higher levels of processing (i.e. the integration of more complex skill clusters), thus explaining the incremental (step by step) nature of learning. (p. 101)

The study of learning styles and strategies is one of the legacies of cognitive views of language learning. According to Hedge (2000), it is assumed that learners have “a preferred way of approaching learning and processing information” (p. 18) and that there are “techniques used by learners to deal with input, assimilate new language, store, retrieve, and practise using it” (p. 19). Metacognitive, communication, and socio-cognitive strategies are equally important for SLA due to the fact that learners need to regulate their learning by planning, thinking, self-monitoring, and evaluating their own learning; to communicate using strategies such as gestures; and practise learners’ target language (Hedge, 2000). Learner strategies contribute to their confidence and have implications for training learners to be more responsible for their own learning (Ellis, 1985). Reaching a wider variety of learners, Heron (1992, cited in Kolb, 1971) calls for a multi-modal learning model that incorporates action, conceptual, imaginal and emotional components characteristic of experiential learning. Learning, then, involves learning through doing and learning about the language along with the use of images and emotions to understand language.

Cognitive explanations of learning are focused on the individual and do not include

the social aspects of language learning which have been the core of interactionist and socio-cultural perspectives on language learning. According to Krashen (1985), learners learn new input only when they are ready to learn and when they notice that there is a gap that they need to fill. This idea has been compared to Vygotsky’s Zone of Proximal Development, defined later in this section, but has also been criticised by interactionist theorists (Donato, 2000), for not making explicit reference of how learners reach the potential development level.

On elaborating upon Krashen’s innatist notion of one-way comprehensible input, interactionist SLA theorists (Lightbown and Spada, 1999; Pica, 1995) claim that interaction – two-way communication, contributes to meaning construction through negotiating comprehensible input and output. Long (1983) broadened Krashen’s claims of comprehensible input by highlighting that learner–learner and learner–tutor interaction and negotiation of meaning (NOM) are necessary to maximise comprehensible input even when comprehension is not achieved, interaction is fundamental to language development. Although from the interactionist perspective, both input and output play a significant role in SLA, output is often secondary.

Although Krashen’s comprehensible input hypothesis has contributed significantly to the understanding of how languages are learned, a number of scholars in SLA argue that ‘output’ and ‘interaction’ are equally significant to language learning. Swain (1985), for instance, claims that ‘output’ is also fundamental to SLA. Combining both Krashen’s input

and Swain's output hypothesis, interaction involves comprehensible input (Krashen, 1985) in order to understand the message and 'output' (Swain, 1995) which allows learners to communicate and negotiate meaning. Moving beyond these claims, Long (1983) argues that interaction helps learners convey meaning through negotiation when comprehensibility has been disrupted. This negotiation, then, enhances comprehension and learners 'notice' and focus on salient linguistic features. In this sense, Swain (1985) provides a more specific account of the value of output when learners interact with each other. Output, Swain (1985) argues, enhances learners' target language fluency; makes learners aware of language knowledge gaps; provides learners with opportunities to experiment with language forms and structures; and promotes feedback from others about language use. Whether this awareness of formal aspects of the language or noticing involves unconscious or conscious learning is still unclear. Schmidt (1995), for instance, contributes to the conception of noticing by stating that whether unconscious or conscious, when learners notice a linguistic form it becomes intake and it is necessary for second language acquisition. Ellis (1997) clarifies Schmidt's noticing hypothesis by highlighting that 'noticing' is connected to explicit knowledge and it is not related directly to learners' output of a particular structure introduced through formal instruction. Broadening Ellis's notion of 'noticing', Fotos (2002) highlights the fact that learners should notice grammar rules through communicative and context-based uses of the structure by providing learners with opportunities to receive input and produce output using the structures.

The concept of authenticity emerged to distinguish between interactions that are not artificially constructed, and are socially and contextually meaningful to learners, and interactions that take place through adapted texts (Van Lier, 1996). There is still the tendency to incorporate fabricated dialogues in language learning materials in which learners are asked to answer predictable questions (Deumert and Spratt, 2005). An authentic text, according to Little et al. (1989), is a text "created to fulfill some social purpose in the language community in which it was produced" (p. 25). The main reasons for using authentic texts, Little et al. (1989) go on, are related to the fact that authentic texts could be more interesting for learners since they have been created for a communicative purpose, focusing on content rather than form and by connecting learners with the kind of materials they have been immersed to acquire their mother tongue.

Considering Vygotsky's ideas of 'novice' and 'expert' learners and expanded conceptions that promote collaborative learning through pair and group work (Lantolf, 2000), peer interaction became fundamental for second language learning. The notion that learners gain proficiency when they interact with more advanced users of the target language (tutors or peer), adds another dimension to the understanding of interactionist perspectives of SLA. From a socio-cultural perspective:

Learning is seen as a social and inter-mental activity, taking place in the Zone of Proximal Development, which precedes individual development (viewed as the internalisation or appropriation of socially constructed knowledge). (p. 214)

The Zone of Proximal Development (ZPD) is defined as the difference between what a child can achieve independently and what a child can achieve when provided with adult assistance (Vygotsky, 1962). This notion of ZPD is considered seminal to the understanding of interaction; there is a general acceptance of the importance of the gap between learners' actual and potential development. It is what occurs in this gap that is of interest to other scholars attempting to explain how the participants in the learning situation mutually contribute to their learning.

A number of scholars in second language learning such as Donato (2000) and Ohta (2000), for instance, are contributing to a broader understanding of Vygotsky's conceptualisation of the ZPD by highlighting the concept of mediation and addressing the way tutors and learners can assist each other in the ZPD (Donato, 2000). In this sense, Donato (2000) moves also beyond Krashen's comprehensible input, by arguing that not only input matters in second language learning, but that social interactions are responsible for shaping learners' cognitive and linguistic development (Donato, 2000). According to Ohta (2000), the effectiveness of assistance to learners in the ZPD depends on a number of factors including tutors' expertise, learners' developmental level, the nature of the tasks, and the participants' goals, among others.

Although this debate about how second languages are learned still continues, there is a general agreement on a number of principles informing second language learning, teaching, and materials. Second language (SL) is learned,

based on current theories of SLA, when: a) learners are exposed to comprehensible input; b) language is used for communicative purposes; c) learners interact with each other to negotiate meaning; and d) learning about the language follows learners' meaning construction. Second language teaching is effective when: a) tutors make content more understandable to learners; b) tutors delay the teaching of grammar in the early stages of SL learning; c) tutors grammar explanations are context, meaning and use-focus; and d) tutors provide learners with opportunities for interaction which allows learners to use their language for communication with the purpose of negotiating meaning in real life situations. Second language learning and teaching materials engage learners when: a) materials are authentic, meaningful and relevant to learners; b) materials focus on providing learners with meaningful tasks; c) materials offer learners grammar explanations in a context of language use rather than isolated language practice; and, d) materials call for learner interaction and negotiation of meaning.

SLA theories contribute to the understanding of how languages are learned, how languages are taught, and how language learning materials may be developed. Recent research demonstrates that CALL is slowly beginning to make use of SLA research (Chapelle, 1997) and task-based learning (Doughty and Long, 2003; Willis and Willis, 2001). In order to illustrate how CALL practices are informed by SLA, the next section presents a revision of CALL approaches and their underpinning principles of second language acquisition.

2. Computer-assisted language learning approaches

Although the use of computers has been

implemented since the 1960s in the teaching and learning of foreign languages in the higher education sector (Davies, 2003a), the use of the term Computer-Assisted Language Learning (CALL) was agreed to be used during a Teachers of English to Speakers of other Languages (TESOL) conference in 1983 to refer to the use of technology in language teaching and learning (Chapelle, 2001, p. 3) where the use of computers in language learning was discussed. This term replaced Computer-Assisted Language Instruction (CALI), which was related to the use of computers based on behaviourist premises of language learning. With the advent of new computer applications such as multimedia, CALL broadened its scope, focusing on learner-centred approaches that promote communication and interaction. In describing the evolution of the term CALL, Chapelle (2001) stated that at the beginning of CALL, teachers were attempting to answer questions related to whether or not there was any use of computers in language learning. During the 1990s, this question changed into 'How can the computer best be used in language teaching?' Chapelle (2001, p. 1). Although the use of CALL has evolved, CALL definitions tend to exclude specific uses of CALL that involved technology changes and new CALL applications. After more than a decade since the term was introduced, broad definitions continued to be introduced. Levy (1997, p. 1), for example, defined CALL as "the search for and study of applications of the computer in language teaching and learning" (Levy, 1997, p. 1).

The European Association for Computer-Assisted Language Learning (EUROCALL), the Computer-Assisted Language Instruction

Consortium (CALICO), and the International Association for Language Learning (IALL) Joint Policy Statement (1999) provided an umbrella concept that covers all CALL practices:

Computer-Assisted Language Learning (CALL) is a relatively new and rapidly evolving academic field that explores the role of information and communication technology in language learning and teaching. (EUROCALL, CALICO, IALL Joint Policy Statement, 1999)

The purpose of providing an overarching concept of CALL was to accommodate the changing and evolving nature of CALL. However, current literature suggests that there is a need to offer more specific CALL characterisations. Davies (1999) favours this position when arguing that CALL definitions should also include current CALL practices such as computer-mediated communication for language learning applications – both asynchronous (e-mail, discussion groups, blogs, wikis) and synchronous (chat, online conferencing). Davies (1999) puts special emphasis on understanding CALL by referring to its primary function—to assist language learning.

Kern and Warschauer (2000) introduced the term Network-Based Language Learning (NBLL) in response to the traditional applications of CALL that include drills, for instance. NBLL refers to "language teaching that involves the use of computers connected to one another in either local or global networks" (Kern and Warschauer, 2000, p. 1). NBLL is focused on new applications of CALL that allow communication between and among

learners and with native speakers of the target language these learners are trying to learn.

Despite the fact that CALL definitions have evolved from structural conceptions of language learning to sociocognitive paradigms that promote language learning through the use of the language in a social context, Beatty (2003) presents an argument consonant with Gremmo and Riley's (1995) conceptions of technological developments in language learners. This author explains that the progress from structural to sociocognitive CALL approaches has not been linear and new applications have not substituted structural CALL tasks: "Instead, many programmes being produced today feature little more than visually simulating variations on the same gap-filling exercises used 40 years ago" (Beatty, 2003, p. 11).

Even though not all CALL practices led to interactive and communicative uses of the language, it has been argued that CALL can offer learners opportunities to foster independent learning – learners can work on their own and control their own learning process (Benson, 2001).

The rapid spread of information together with the implementation of Communication and Information Technology (C&IT) in language learning initiated a debate on framing a language learning theory in technological-based environments; nevertheless, the emergence of any widely accepted overarching theory has been dilatory. Warschauer and Healey (1998) highlighted the idea of trying to learn from existing theories rather than creating a theory for Computer-Assisted Language Learning. The purpose of this section is to present different CALL approaches discussed in recent

literature rather than providing a history of CALL, that has already been documented by a number of scholars within this discipline (Beatty, 2003; Chapelle, 2001; Davies, 2003; Kern and Warschauer, 2000; Levy, 1997; Warschauer, 1996).

Foreign language teaching and learning approaches have moved from product-oriented to process-oriented approaches. Warschauer and Healy (1998), two of the key authors in researching the use of Information and Communication Technology (ICT) in foreign language learning, presented a description of the three main phases that categorised the development of Computer-Assisted Language Learning–CALL: behaviouristic CALL, communicative CALL, and integrative CALL. In an attempt to broaden this categorisation towards the description of the grounded principles of network-based language learning (NBLL), Kern and Warschauer (2000) divided CALL history into the following approaches: structural, cognitive, and sociocognitive approaches to CALL. These CALL approaches are informed by linguistic theories represented by structuralism (Bloomfield, 1933), cognitivism (Chomsky, 1957) and sociocognitivism (Hymes, 1971; Halliday, 1984). Levy (1997) provided a similar distinction by placing CALL within three chronological periods: *a*) CALL in the 1960s and 1970s – informed by three main disciplines "pedagogical audio-lingualism, psychological behaviourism, and linguistic structuralism" (Levy, 1997, p. 14); *b*) CALL in the 1980s – represented by Communicative Language Teaching (CLT); and *c*) CALL in the 1990s – that has emerged parallel to socio-cognitive theories of language learning (Levy, 1997).

Kern and Warschauer (2000), explaining the nature of language instruction within these theoretical frameworks, offered a pedagogical distinction among the three. Language instruction based on structural paradigms concentrates on “well-formed language products” (Kern and Warschauer, 2000, p. 6) and the purpose of instruction is focused on ‘discrete skills’ (Kern and Warschauer, 2000). Over three decades (1950s-1980s), Skinner (1957), and his behaviouristic theory of learning – the stimulus-response mechanism through which learning takes place – was the predominant theory of learning. Skinner’s ideas were likewise transferred into the design and use of computer applications for learning. Behaviourist models of language learning claim that learning takes place through imitation, repetition and habit formation. Language learning approaches were focused on behaviourist principles and on teacher-directed schemes. Learners, then, are considered empty vessels into which knowledge is transmitted and poured. Behaviourist language learning approaches promote the mastery of form and structure, which are learned through repetition and memorising. This bottom-up paradigm leads to the creation of language learning activities based on, for instance, discrete units of the language that go from simple to complex structures (Beatty, 2003). Audiolingual language learning approaches emerge with the idea that drilling – listening and repeating exercises – enhances language learning. Technology – in the form of language labs – provides learners with the opportunity to listen and repeat isolated units of the language and, therefore, to learn (Fitzpatrick and Davies, 2003).

In reaction against these mechanistic ideas of learning, the works of scholars like Piaget (1967) and Vygotsky (1962) influenced second language acquisition theories; what had previously been conceived as a mechanism of stimuli and responses emerged as a process of cognitive and socially constructed and transformed knowledge. Despite the move from behaviouristic to constructivist theories of learning, traces of mechanistic theories of learning still remain in learning environments. Cognitive/constructivist theories of language instruction favour the use of cognitive processes when learning and using the language and are focused on developing communication and use. Constructivist theories of language learning call for the adoption of learner-centred approaches. Learners use their existing knowledge to construct meaning. Learners rely on their existing ‘schemata’ “to select and transform information, create hypotheses and make decisions” (Beatty, 2003, p. 91). Through the understanding of schema theory and the way knowledge is organised, CALL practitioners create language tasks that encourage learners to use their previous knowledge to confront it with the information accessed and then transform this knowledge into a new learning experience to be used outside the classroom. Meaning is individually and socially constructed and learning takes place through social interaction and collaboration in which both peers and teachers play an active role. Following cognitive/constructivist premises, communicative language learning approaches provide a stronger emphasis on meaning construction and language use through the use of authentic contexts (Shetzer and Warschauer, 2000). Language learning is focused on problem-solving

activities through learners' interaction with one another (Fitzpatrick and Davies, 2003).

Instruction, following a socio-cognitive framework, emphasises the negotiation of meaning using authentic communicative tasks through collaborative interaction with others (Kern and Warschauer, 2000). From a socio-cognitive perspective, language learning is not solely confined to cognitive factors: immersion in social dynamic contexts is also necessary for knowledge construction. Learning is conceived, then, as a socio-cognitive active process: learners are active seekers of meaning – using their prior knowledge – and the emphasis is no longer on the product, but on the process that leads to meaning construction (Jonassen et al., 1999). Regarding the integration of the social aspects determining language learning, Vygotsky's explanations provide a framework towards understanding how language learning occurs in a social dynamic context through the collaboration that emerges from interaction among peers (Ellis, 2003). Although the shift from one trend to another is not linear, placing CALL approaches within three main approaches – behaviourist/structuralist, constructivist/cognitive and socio-cognitive – provides an insight into understanding how CALL has evolved along with language learning theories and the development of new technologies.

The behaviouristic/structuralist CALL – prevalent in the 1960s and 1970s – was grounded on behaviouristic theories of learning. In most of the computer programmes – implemented during the mainframe¹ era – computer-based learning activities were created using programming languages in

order to store them in a mainframe to be accessed by learners (Chapelle, 2001). These computer-based learning tasks – called courseware – have been associated with self-contained programmes such as tutorials, drills, simulations and games that resembled the stimuli and response pattern characteristic of this mechanistic theory of learning (Kern and Warschauer, 2000). Within this paradigm, the computer was considered a mechanical tutor that provided “positive or negative feedback to learners on the formal accuracy of their responses” (Kern and Warschauer, 2000, p. 8). PLATO (Programmed Logic for Automated Teaching Operations) – the first CALL project – was developed at the University of Illinois in 1960 and consisted of repetitive language drills, grammar explanations, and translations (Warschauer and Healy, 1998). PLATO provided learners with opportunities to communicate with other learners using notes and restricted e-mail facilities called ‘talk’ that could be used by learners who were accessing the application simultaneously. The Time-Shared, Interactive, Computer Controlled Information Television (TICCIT) project constituted another CALL project launched during the period of behaviourist CALL. TICCIT combined text, audio and video, and allowed learners to make choices related to the content of these media and the learning strategies through the use of special keyboard keys that included ‘rule, example, practice, advice, easy, hard’ functions (Levy, 1997, p. 18). CALL applications, within behaviourist perspectives of language learning, focus on reinforcing responses to learners through the use of text or images for instance, and CALL language activities also incorporate a system to score learners (Beatty, 2003).

CALL practices started to move from prescriptive language instruction to focus on language use. This shift was influenced by the emergence of the communicative language learning approach and the possibilities that the microcomputer offers to assist language learning (Levy, 1997). The second phase, the communicative CALL – in the 1970s and 1980s – was based on cognitive/constructivist theories of language learning and referred to learning as a process of constructing meaning using learners' previous experiences in order to build up new knowledge (Beatty, 2003). Within this constructivist stance, learners utilised their existing knowledge to undertake tasks and to make decisions and solve problems. Although computers functioned as tools allowing learners to explore simulated environments, they also provided feedback and interaction. The emphasis was on generating more authentic activities that would allow users to learn about the language explicitly, and to use the language in a context that required communicative activities. Although the programmes designed under these premises continued to introduce the computer as the teacher, the difference between the drill-and-practice exercises and communicative-based tasks resided in the fact that learners made their own choices and interactions in order to get any feedback. Constructivist CALL, Beatty (2003) affirms, goes beyond memorisation skills, allowing learners to construct meaning using their background knowledge.

In illustrating the focus of communicative CALL, Warschauer and Healy (1998), described the nature of language tasks in the following way:

Proponents of communicative CALL stressed that computer-based activities should focus more on using forms than on the forms themselves, teach grammar explicitly rather than implicitly, allow and encourage students to generate utterances rather than just manipulate prefabricated language, and use the target language predominantly or even exclusively. (p. 58)

Communicative CALL emphasises functional and meaningful language use; language tasks therefore focus on communication rather than on mastering grammar structures before using the language. The communicative CALL software developed during this period included programmes of text reconstruction, that involved learners working individually or in groups to rearrange texts and elucidate language patterns and meanings, and simulations, in which learners undertook discussion and discovery language tasks (Warschauer and Healy, 1998). The Athena Language Learning Project (ALLP) was established in 1983 at the Massachusetts Institute of Technology (MIT) in order to promote the creation of communicative-based software for foreign language learning that enables learners to explore video-based conversations in order to try to understand the plot of a story and to interact with the characters in it by asking them questions (Levy, 1997). Almost parallel to the emergence of cognitive approaches, the socio-cognitive-oriented paradigms emerged. The third phase, integrative/socio-cognitive CALL, was described by Warschauer and Healy (1998) in the following way:

Integrative CALL seeks both to integrate various skills (e.g., listening, speaking, reading, and writing) and also integrate technology more fully into the language learning process. In integrative approaches students learn to use a variety of technological tools as an ongoing process of language learning and use, rather than visiting the computer lab on a once week basis for isolated exercises (whether the exercises be behaviouristic or communicative). (p. 58)

Integrative CALL, then, needs to call for collaboration in order to create language learning tasks that put together language courses and language learners. Teachers need to encourage learners to develop critical thinking through activities that require learners to work collaboratively (Beatty, 2003). This need for teachers' guidance towards the development of learners' autonomy was also highlighted by (Warschauer, 2002). Socio-cognitive CALL was focused on promoting human interaction through the use of Computer-Mediated Communication (CMC) allowing learners to communicate with other learners or with speakers of the target language (Kern and Warschauer, 2000).

Integrative CALL emphasises the integration of language and the connection between the course and the language tasks provided. Learners, using integrative CALL material, combine the use of computer tools with their language learning. Multimedia, networked computers and the use of authoring tools for the web represented the technological tools utilised within the integrative CALL period. Authoring tools, for instance, provide learners with the

opportunity to select between multiple-choice responses and get hints that will help them to find the most accurate answer (Arneil and Holmes, 1999). The International E-mail Tandem Network constitutes an example of integrative CALL, created by Brammerts (1996). The Tandem Network links universities around the world in order to provide learners anywhere with opportunities to learn language through e-mail exchanges and discussion lists (Levy, 1997).

Interactive web-based language tasks provide learners with opportunities to communicate and exchange information in order to negotiate meaning and to construct knowledge. It has been argued that the use of CMC for language learning promotes interaction and provides opportunities for learners to negotiate meaning (Kern and Warschauer 2000). In this respect, Chun and Plass (2000) state that

Networked multimedia environments provide opportunities for asynchronous and synchronous dialogue in which meaning can be negotiated in modes other than written or printed text. The interactions between and among learners, as well as the interaction of the learner with authentic material in the Web environment, enhance the "learning-as-knowledge construction" process. (p. 161)

Although CMC environments are framed within the integrative CALL approaches, providing learners with synchronous and asynchronous tools for communication and interaction, these computer-based networks still offer text-based interaction (Warschauer, 1996).

The computer plays different roles that are influenced by the learning approaches that framed CALL practices. Considering CALL changes from the structural to socio-cognitive frameworks, computers play the role of teachers offering learners drill and skill practice through which learners get feedback to correct their answers (Kern and Warschauer, 2000). The role of the computers within cognitive CALL approaches consists of providing learners with “language input and analytical and inferential feedback” (Kern and Warschauer, 2000, p. 13). Within socio-cognitive CALL frameworks, the computer is used as a tool in order to offer learners opportunities for social interaction by engaging them in communicative tasks with other learners. Three metaphors are used in the literature to identify the role of computers within each CALL approach: the computer as tutor, the computer as tool, and the computer as toolkit. The computer as a toolkit metaphor highlights the mediational role that computers play in order to facilitate communication with other learners as well as accessing information (Kern and Warschauer, 2000).

Development of CALL applications fostered the creation of new language learning environments; however, the evolution of CALL innovation has not run parallel with current language learning theories. Currently, the use of computers in foreign language classrooms resembles all three paradigms (Davies, 2001) and there are still drill programmes that promote grammar and vocabulary practice (Fotos and Browne, 2004). Multimedia represents another type of CALL practice that consists of the use of courseware focusing on specific aspects

of the language, such as grammar, that may include hyperlinks to provide learners with opportunities to obtain supplementary material. The Internet also constitutes another CALL application that offers learners tools to search for information. Concordancing and referencing corpus can be used in order to understand the usage of vocabulary and grammar. Distance learning and test taking also offer learners the chance to enrol in online language courses and to take language test using computers. This range of CALL activities provide evidence that “CALL is now an integral part of L2 classrooms and is likely to assume increasing importance as technology improves” (Fotos and Browne, 2004, p. 11). Although this categorisation is useful to the understanding of the use of CALL activities, characterising CALL practices considering technology advances needs to be connected to language learning and CALL approaches. In this sense, the adoption of approaches that combine one or two CALL practices has been suggested (Davies, 2003; Felix, 2001). Integrative CALL, Fotos and Browne (2004) argue, provides learners with flexible information that is accessed by learners on their own time and at their own pace, helping them to develop autonomy. Fotos and Browne (2004) place the Internet within integrative CALL approaches arguing that the Internet offers learners the tools to communicate and interact with their peers by promoting “the use of CALL for information retrieval, creating the concept of computer literacy, a term referring to the development of skills of data retrieval, critical interpretation, and participation in online discourse communities” (Fotos and Browne, 2004, p. 6).

There is an existing debate about the use of the web as an integrative CALL approach. Scholars in this area have offered arguments in favour of the creation of hybrid approaches to provide learners with high-quality materials that enhance communication and interaction. Web-based video materials are primitive compared with off-line materials such as multimedia (Davies, 2003). This last point resembles what Felix (2001) envisioned when saying that hybrid approaches are recommended to offer learners communicative and interactive tools:

The Web provides wonderful potential for creative teachers to motivate students and keep them interested, and individual practitioners are using different combinations of approaches in a variety of ways. Included among these are hybrid approaches designed to avoid potential technical problems, such as downloading activities from the web on to a self-contained intranet, integrating CD-ROMs and the web, or running audio conferences or video conferencing with web activities. (p. 190)

Warschauer (1996) argued that multimedia does not replace the type of integration that the web offers: the integration of meaning and authentic communication. In predicting the future of CALL, Warschauer (2002) suggests two likely trends in CALL applications: language software will be integrated into the internet when broadband technologies improve and, as a consequence, traditional language activities will be combined with communicative tasks using the same internet software (Warschauer, 2002, p. 7). Davies (2003) suggests that although skill-learning

web-based tasks still exist, there is still a wide range of web-based language resources that provide communicative web-based tasks, as Warschauer (2002) predicted. Synchronous communication among learners and teachers is thus possible using virtual language learning environments (Davies, 2003).

It is widely accepted that the web offers authentic, meaningful, and up-to-date information, which provides a valuable technological tool that allows teachers and learners to bring the authentic and real-life world into the classroom. The integrative features that the web offers have not been fully exploited yet. Web-based language learning activities range from reduplications of traditional grammar-based textbooks to web-based tasks and projects that promote interaction and collaboration between and among learners (Felix, 1999). There is still a need for the integration of the technological tools that the web offers and what learners can do in order to assist their language learning through interactive meaningful activities.

3. So...where do SLA and CALL meet then?

The answer is clear, CALL practices need to be informed and supported by SLA theories in order to create e-environments that offer learners comprehensible input and encourage learners to communicate and interact with their peers. It is not enough to technically master e-tools: Teachers need to find ways of engaging learners in web-based tasks by calling learners' attention to their culture; providing learners with meaning-focused tasks which allow learners to use language for real communication; creating production oriented tasks which derive from the input

in order to contextualise language use and form; and, offering learners feedback based on task outcomes that takes the form of providing explanations about the language they have used. Second language teachers deal with complex decisions in integrating new technology into language learning tasks. Web-based language learning task (WBLLT) design may avoid reduplicating the same mistakes from traditional learning approaches. Considering relevant SLA theories, WBLLT's design need to be underpinned by the notions of *comprehensible input* (Krashen, 1985) – to expose learners with meaningful linguistic information, *interaction* (Lightbown and Spada, 1999) – to encourage learners to communicate, to exchange information and negotiate meaning, *noticing* (Fotos, 2002) – to internalise grammar rules in a communicative and context-based language use, *output* (Swain, 1995) – to get learners create their own oral or written productions which will, consequently, emerge from interaction. Based on the literature review presented in this paper, there are a number of issues that could help teachers design web-based tasks, integrating both SLA theories and CALL approaches. Although nowadays more and more authentic digital texts are available on the Web, it is still not easy for most teachers to incorporate them into their language class. Technology *per se* does not entitle learners to construct meaning; it is the nature of language tasks that provides learners with meaningful language learning opportunities through which they communicate and interact with other learners. Meaning construction and exchange is central to meaning-based language learning approaches. Task-based language learning approaches, for instance, promote language use through communicative language learning activities (Willis and Willis,

2001). The web, certainly, offers authentic information for language learners, bringing the target language world into the learning experience. The creation of meaningful and authentic tasks that provide different levels of interactivity in accordance with learners' needs and language levels is paramount to promote communication and interaction between and among learners (Felix, 1999). The use of web-based language tasks which allow interaction among learners through the use of synchronous and asynchronous communicative tools and web-based projects which allow learners to publish information on the web constitute two examples of good practice (Shetzer and Warschauer, 2000). Teachers may create, for instance, a blog for their class to encourage learners to communicate with each other using the comment feature of blogs and/or by setting up a parallel e-mail discussion group to enrich learners' discussion. This is what Felix (2001) call hybrid approaches and its adoption may help teachers provide learners with a variety of e-authentic sources through different communicative and interactive e-tools.

Tasks based on the Web need to expose learners to enough comprehensible input (Krashen, 1985) and to plenty opportunities for understanding this input, as suggested by Ellis (2003). Comprehensible input needs to be enhanced by combining audio, reading, and printing information to cater for different learners' needs. Web-based tasks need to offer learners with enough support to make input comprehensible by including:

- a) user-friendly design by making the content easy to navigate and download audio files – learners could listen to the material repeatedly after completing tasks;

- b) clear and engaging instructions for learners to undertake web-based tasks – learners could navigate from one screen to another and to help learners feel at ease by avoiding cramming different activities and long texts together on the same page;
- c) standard colours and format to include the web-based listening tasks and pictures in order to facilitate learners' familiarisation with the web-based materials and tasks;
- d) pictures related to the content of the materials and tasks and to the target language culture;
- e) web links with explanations to guide learners through the content and function of the website;
- f) written or audio recorded anecdotes in order to help learners relate to the topic and understand the target language culture;
- g) varied topics and levels of difficulty in order to cater for different learners' needs and interests, and
- h) good-quality sound playback for the audio materials.

This comprehensible input provision is consonant with task-based design approaches by offering learners enough opportunities for understanding input, as suggested by Ellis (2003) and applies particularly to the way in which materials can have an impact on learners and make learners feel at ease by considering Krashen's (1985) comprehensible input and affective filter hypothesis. Considering Krashen's (2004) notions of topic based activities that encourage learners to communicate their ideas and emotions, Web-based tasks involve considering learner's topic interests that are relevant to them by giving learners tasks to search for information

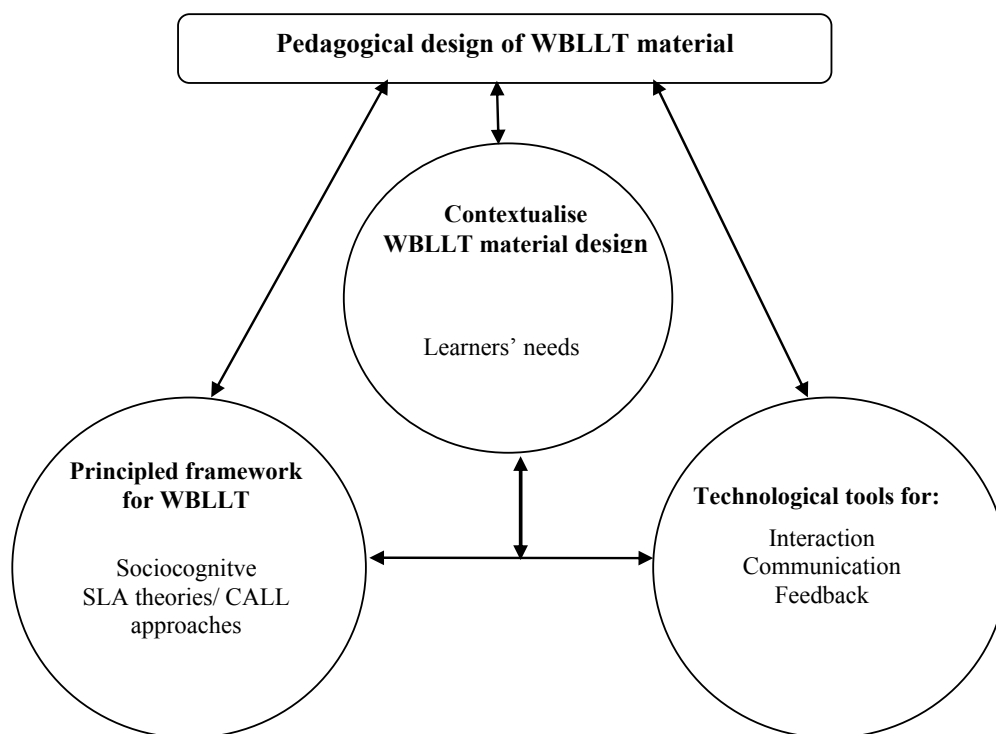
themselves. One of the benefits of providing learners with theme-based tasks is to introduce learners to a contextualised use of certain vocabulary and expressions that constituted one of the premises of meaning focus and explicit learning approaches of grammar (Fotos, 2002). Another relevant issue to take into account when designing web-based tasks is learners' language levels - from beginners to more advanced learners, but teachers should allow learners to move through one level to another when they consider that they are ready to take more risks.

Web-based tasks, following cognitive perceptions of SLA and highlighting learners' use of existing schemas (Hedge, 2000), need to follow the premise of anticipating learners' previous knowledge of the topic and building up vocabulary that would allow learners to use it when undertaking the tasks. Web-based pre-tasks should give learners enough opportunities to use their cognitive strategies in order to anticipate and build up prior knowledge, mainly about vocabulary and expressions related to the topic to make learners understand the input by engaging them with authentic material in real contexts of use. Teachers should bear in mind that meaning construction precedes conscious learning: grammar rules and structure are learned through constant exposure to authentic web-based material (Fotos, 2002). Early exposure to structural tasks, and premature learners' production could interfere with the understanding of the input by making learners pay unnecessary early attention to vocabulary and grammar.

Web-based tasks are more effective if they are divided into pre-whilst and post-activities.

This organisation may allow learners to use their cognitive strategies by anticipating and building up prior knowledge, mainly about vocabulary and expressions related to the topic, in order to complete the post-tasks. Post-tasks design involve making learners notice certain structural aspects which

derived from the context of the authentic material. This post-task design is related to the notion of ‘noticing’ Schmidt (1995) and ‘comprehensible output’ (Swain, 1995). In this sense, post-tasks invite learners to make a conscious attempt to undertake structural and comprehension tasks.



The integration of SLA theories, current CALL approaches and technological advances, is needed. The diagrammatic representation, shown below, places three main interconnected components of the design of WBLLTs, contextualisation, principled framework (SLA theories and CALL approaches), and technological tools, in order to provide a more pedagogically sound response to WBLLT design.

focused, learner-centered, communicative approaches, CALL itself has evolved from teacher-created structural applications to student-centered, meaningful, interactive and collaborative practices. CALL, then, has encountered in SLA theories fundamental premises to support the role of the Web as a platform for searching, communication, and interaction. ■

SLA has witnessed a movement from form-focused and teacher-centered to meaning-

e-mail: teadira@ula.ve

Footnotes:

- ¹ Mainframe computer refers to a very large computer that can serve many users at remote terminals (ICT4LT Project 2000)

References

- Arneil, S., & Holmes, M. (1999). Juggling hot potatoes: decisions and compromises in creating authoring tools for the Web. *ReCALL*, 11 (2), 12-19.
- Arnold, J., & Brown, D. (1999). A map of the terrain. In J. Arnold (Ed.), *Affect in language learning* (pp. 1-24). Cambridge: Cambridge University Press.
- Beatty, K. (2003). *Teaching and researching computer-assisted language learning*. London: Longman.
- Benson, P. (2001). *Teaching and researching autonomy in language learning*. London: Pearson Education Limited.
- Bloomfield, L. (1933). *Language*. New York: Holt, Rinehart & Winston.
- Brammerts, H. (1996). Tandem language learning via the Internet and the International E-mail Tandem Network. In D. Little & H. Brammerts (Eds.), *A guide to language learning in Tandem via the Internet* (pp. 9-22). Centre for Language and Communications Studies, Trinity College, Dublin. Available: <http://www.jtap.ac.uk/reports/html/jtap-041.html>
- Chapelle, C. (1997). CALL in the year 2000: Still in search of research paradigms? *Language Learning and Technology*, 1 (1), 19-43.
- Chapelle, C. (2001). *Computer applications in second language acquisition. Foundations for teaching, testing and research*. Cambridge: Cambridge University Press.
- Chomsky, N. (1957). *Syntactic structures*. The Hague: Mouton.
- Chun, D., & Plass, J. (2000). Networked multimedia environments for second language acquisition. In M. Warschauer & R. Kern, *Networked-based language learning teaching: concepts and practice* (pp. 151-170). Cambridge: Cambridge University Press.
- Davies, G. (1999). Introduction to computer assisted language learning (CALL) ICT4LT Module 1.4. Sections 1-4. Thames Valley University: Information and Communication Technology for Language Teachers (ICT4LT) Organisation. Available: <http://www.ict4lt.org>
- Davies, G. (2001). Do it on the web. *Language Learning Journal*, Association for Language Learning, (24), 34-35. Available: <http://www.camsoftpartners.co.uk/DoingIt.htm>
- Davies, G. (2003). *Computer assisted language learning. Where are we now and where we are going?* NESTA FutureLab learning article. Available: <http://www.nestafuturelab.org/articles/learn23.htm>
- Deumert, A., & Spratt, C. (2005). Authentic teaching as the context for language learning. *Educational Technology & Society*, 8 (2), 83-93.
- Donato, R. (2000). Sociocultural contributions to understanding the foreign and second language classroom. In J. Lantolf (Ed.), *Sociocultural theory and second*

- language learning (pp. 27-50). Oxford: Oxford University Press.
- Doughty, C., & Long, M. H. (Eds.) (2003). *Handbook of second language acquisition*. New York: Basil Blackwell.
- Ellis, R. (1985). *Understanding second language acquisition*. Oxford: Oxford University Press.
- Ellis, R. (1997). *SLA Research and language teaching*. Oxford: Oxford University Press.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford: Oxford University Press.
- Felix, U. (1999). Web-based language learning: a window to the authentic world. In M. Levy & R. Debski (Eds.), *WORLDCALL: Global perspectives on Computer-Assisted Language Learning* (pp. 85-98). Amsterdam: Swets & Zeitlinger.
- Felix, U. (2001). *Beyond Babel: language learning online*. Melbourne: Language Australia Ltd.
- Fitzpatrick, A., & Davies, G. (Eds.) (2003). *The impact of information and communications technologies on the teaching of foreign languages and on the role of teachers of foreign languages*. EC Directorate General of Education and Culture. Available: www.icc-europe.com
- Fotos, S. (2002). Structured-based interactive tasks for the EFL learner. In E. Hinkel & S. Fotos (Eds.), *New perspectives on grammar teaching in second language classrooms* (pp. 135-154). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Fotos, S., & Browne, C. (2004). The development of CALL and current options. In S. Fotos & C. Browne (Eds.), *New perspectives on CALL second language classrooms* (pp. 3-14). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Gremmo, M., & Riley, P. (1995). Autonomy, self-direction, and self-access in language teaching and learning: the history of an idea. *System*, 2 (3), 151-164.
- Halliday, M. A. K. (1984). *The semiotics of culture and language*. London: Pinter.
- Hedge, T. (2000). *Teaching and learning in the language classroom*. Oxford: Oxford University Press.
- Heron, J. (1992). *Feeling and personhood: Psychology in another key*. London: Sage.
- Hymes, D. (1971). *On communicative competence*. Philadelphia, PA: University of Pennsylvania Press.
- Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999). *Learning with technology: a constructivist perspective*. Upper Saddle River, NJ: Merrill/Prentice-Hall.
- Kolb, K. J. (2000). Using the Internet in ESL writing instruction. *The Internet TESL Journal*, 1 (11). Available: <http://www.aitech.ac.jp/~iteslj/>
- Kern, R., & Warschauer, M. (2000). Theory and practice of network-based language teaching. In M. Warschauer & R. Kern (Eds.), *Network-based language teaching: concepts and practice* (pp. 1-19). New York: Cambridge University Press.
- Krashen, S. (1981). *Second language acquisition and language learning*. Oxford: Pergamon Press Ltd.

- Krashen, S., & Terrel, T. (1983). *The natural approach. Language acquisition in the classroom*. Oxford: Pergamon Press Ltd.
- Krashen, S. (1985). *The input hypothesis*. Beverly Hills, CA: Laredo Publishing Company.
- Krashen, S. (2004). *Applying the Comprehension Hypothesis: Some Suggestions. Presented at 13th International Symposium and Book Fair on Language Teaching*. English Teachers Association of the Republic of China, Taipei, Taiwan.
- Lantolf, J. P. (2000). Second language learning as a mediated process. *Language Teaching*, 33, 79-96.
- Levy, M. (1997). *Computer-assisted language learning: context and conceptualization*. Oxford: Oxford University Press.
- Lightbrown, P., & Spada, N. (1999). *How languages are learned*. Oxford: Oxford University Press.
- Little, D., Devitt, S., & Singleton, D. (1989). *Learning foreign languages from authentic texts: theory and practice*. Dublin: Authentik, in association with CILT.
- Long, M. (1983). Native speaker/non-native speaker conversation in the second language classroom. In M. A. Clarke & J. Handscombe (Eds.), *On TESOL '82: Pacific Perspectives on Language Learning and Teaching*. Washington, CD: TESOL.
- McLaughlin, B. (1987). *Theories of second language learning*. London: Arnold.
- Mitchell, R., & Myles, F. (2004). *Second language learning theories* (2nd ed.). London: Arnold.
- Ohta, A. S. (2000). Rethinking interaction in SLA: developmental appropriate assistance in the zone of proximal development and the acquisition of L2 grammar. In J. Lantolf (Ed.), *Socio-cultural theory and second language learning* (pp. 51-78). Oxford: Oxford University Press.
- Piaget, J. (1967). *Six psychological studies*. New York: Random House, Inc.
- Pica, T. (1994). Research on negotiation: what does it reveal about second language conditions, processes and outcomes? *Language Learning*, 44 (3), 493-527.
- Reid, J. (1999). Affect in the classroom: problems, politics and pragmatics. In J. Arnold (Ed.), *Affect in language learning* (pp. 1297-306). Cambridge: Cambridge University Press.
- Shetzer, H., & Warschauer, M. (2000). An electronic literacy approach to network-based language teaching. In M. Warschauer & R. Kern (Eds.) *Network-based language teaching: Concepts and practice* (pp. 171-185). New York: Cambridge University Press.
- Skinner, B. F. (1957). *Verbal behaviour*. New York: Appleton-Century-Crofts.
- Schmidt, R. (1995). Consciousness and foreign language learning: A tutorial on the role of attention and awareness. In R. Schmidt (Ed.), *Attention and awareness in foreign language teaching and learning (Technical Report No. 9)* (pp. 1-64). Honolulu: University of Hawaii at Manoa.
- Swain, M. (1995). Three functions of output in second language learning. In G. Cook

and G. Seidhofer (Eds.), *Principles and practices in applied linguistics: studies in honour of H. G. Widdowson* (pp. 125-144). Oxford: Oxford University Press.

(Eds.). *Teaching English to speakers of other languages* (pp. 173-179). Cambridge: Cambridge University Press.

Van Lier, L. (1996). *Interaction in the language curriculum: Awareness, autonomy and authenticity*. London: Longman.

Este artículo fue presentado a Entre Lenguas en marzo de 2008, revisado en mayo 2008 y aprobado definitivamente para su publicación en julio de 2008.

Vogel, T. (2001). Learning out of control: some thoughts on the World Wide Web in learning and teaching foreign languages. In A. Chambers & G. Davies (Eds.), *ICT and language learning. A European Perspective* (pp. 133-145). Lisse: Swets & Zeitlinger.

Vygotsky, L. (1962). *Thought and language*. Cambridge, MA: MIT Press.

Warschauer, M. (1996). Computer-assisted language learning: An introduction. In S. Fotos (Ed.), *Multimedia language teaching* (pp. 3-20) Tokyo: Logos International.

Warschauer, M., & Healy, D. (1998). Computer and language learning: an overview. *Language Teaching*, 31, 57-71.

Warschauer, M. (2002). A developmental perspective on technology in language education. *TESOL Quarterly*, 36 (3), 453-475.

Warschauer, M (2004). Technological change and the future of CALL. In S. Fotos & C. Browne (Eds.), *New perspectives on CALL second language classrooms* (pp. 15-26). Mahwah, NJ: Lawrence Erlbaum Associates.

Willis, D., & Willis, J. (2001). Task-based language learning. In R. Carter & D. Nunan