

November 10, 2011

Computers and their suitability for second and foreign language error correction

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Abstract

This article is an attempt to ascertain the suitability of computers for second and foreign language (SL/FL) error correction, especially those made by SL/FL learners. For this purpose, the handling of such errors proposed in Second Language Acquisition (SLA) literature will be examined. Subsequently the technologies capable of evaluating student output and identifying and correcting Non-Native Speaker (NNS) errors will be examined. Though it will be made quite clear that the computer cannot substitute a human being in total language processing, some strengths of artificial intelligence in partial language processing will be pointed out and their suitability for L2 error correction will be highlighted. The article will conclude emphasizing that the use of high quality multimedia applications and programmes stimulates and fosters language learning.

Key Words: computer, language errors, error correction, second language (L2), Computer Assisted Language Learning (CALL), Intelligent CALL (ICALL).

Introduction

L2 learners around the world seem to be doomed to make mistakes which clearly label them as non-native speakers (NNS) in their attempts to acquire, in addition to their mother tongue, another language. The nature of their expression is sometimes treated with patience and understanding by native speakers of the target language, while other times, patience and understanding seem to diminish.

Van Lier (1996) notes that sometimes intolerance prevails towards NNS statements, and, therefore, native speakers put the onus on the NNS to improve their expressions, so that it can be produced at the level of the standard language. This

can lead to frustration for both sides, especially if the NNS cannot produce the correct language that is expected. This can affect the motivation of the NNS. Moreover, many language learners throughout the world expose themselves to such risks. They do this by moving temporarily or permanently to another country, often with the goal of completing their college education. In the humanities and social sciences, language is the crucial factor that influences academic success, often being disadvantageous to the very non-native speakers.

Artificial Intelligence (AI), on the other hand, can deal with new problems, once the general principles and techniques for working with

computer applications for language learning have been learnt. For example, to recognise the erroneous sentence of a student, a computer programme should have the same correct and incorrect forms. In this way, and so that the computer application can provide the student with feedback about why the sentence has errors, the system should also include a record of wrong rules. For an identical syntax error but with a different vocabulary, this application again should have the exact expression pre-stored in its memory. However, an intelligent program would only have to have a rule that the student uses for such an erroneous production. The programme theoretically could recognise the same type of error in any context and any vocabulary. Thus, given the power of AI techniques to correct the user at the same time that he is committing the error, such applications are considered as the best ally of the teacher in correcting L2 errors.

By taking into account the above, this paper aims to highlight the importance of computer and technological applications and programmes to correct language errors, as it relates to Second Language Acquisition (SLA). Thus, this paper outlines the main criteria to consider when they intend to introduce computer applications in teaching and learning and language acquisition and automatic processing of natural language.

Historic Framework of CALL

Computer-Assisted Language Learning, (CALL) is a type of educational technology designed to serve as a learning tool. In simple terms, it refers to the use of computer applications in teaching and learning languages.

For many years, foreign language teaching has traditionally been limited to opportunities created by the teacher in the classroom, getting and extracting information from text books, tapes, recordings, among others. In the 90's, alternative ways of teaching languages were developed such

as distance learning and self-directed learning through the Internet, with two purposes: first, save resources and, secondly, reduce geographic barriers and time constraints when taking a foreign language course. Indeed, the use of computers in language teaching and learning has generated major changes in how second language are taught and learnt- better learning in less time, more lasting learning and improving communicative competence. (Chapelle, 2001 & 2003; Levy, 1997; Warschauer, 2000).

The use of computational tools has become a new medium which shapes the processes and products of communication. Because multimedia technology has opened new opportunities for communication between teachers and learners, and among those who speak a second language, many language teachers have realised the enormous potential for teaching computer-mediated learning (Levy, 1998; Warschauer & Healy, 1998; Warschauer & Kern, 2000).

Since the 60's, language teachers have witnessed dramatic changes corresponding to the teaching-learning of languages. This approach has been extended from the teaching of discreet grammatical structures to the development and improvement of the communicative ability. Computers had begun to be used by universities, especially in the United States. Its use became an integral part in educational training of university students in some careers. Soon, multimedia technology has started to be used experimentally in other levels of education (Garrett, 1987; Heift & Schulze, 2003; Levin & Evans, 1995).

The first phase of CALL, conceived in the 50's and implemented in the sixties and seventies, was based on the then behaviourist theory which stressed on repetitive language exercises (Chapelle, 2001 & 2003; Levy, 1997; Warschauer, 2000; Taylor 1980). This stage is based on the model of the computer as tutor and its arguments were that:

(1) the computer was ideal for carrying out repeated exercises because the machine, unlike a teacher, it can do reps with the same linguistic material without getting tired or making mistakes, as well as providing immediate feedback.

(2) the computer could present such material on an individual basis, allowing students to work at their own pace and paving the way to success.

In summary, the behaviourist theory focused on the development of language skills. It focused its attention primarily on grammar or focus-on-form exercises.

In the seventies and eighties behaviourist call was undermined by two important factors. First, because behaviourist approaches to language learning had been rejected in theory and pedagogy. Second, because, with the advent of the microcomputer, the way was paved for a new range of possibilities and a new stage of CALL.

The new phase of CALL was based on the communicative theory of teaching which became prominent in the 70 and 80 (Warschauer, 1996). Followers of this theory argued that the exercise and practice programmes of the previous decade did not provide enough value to authentic communication. Creativity in expressing oneself was valued above memorization. The negotiation of meaning had become more powerful and important. Comprehension had become a more fundamental domain in education.

One of the main representatives of this new theory was Underwood (1984), who proposed a set of principles for communicative CALL : (1) it focuses on the use of the forms themselves; (2) it teaches grammar implicitly rather than explicitly; (3) it allows and gives encouragement to learners to generate original statements rather than manipulating the fabricated language; (4) it does not judge or

evaluate everything that the students nor does it give them congratulatory messages, lights or bells, and (5) it prevents saying to the students that they are not right and is flexible to a variety of responses from the students.

In the late 80's, it was felt that CALL still left much to be desired and that it still was not able to extract the full potential of computers. Stevens (1989) was one of the critics who said the computer was used in an ad hoc and disconnected way and therefore, it was necessary to make a greater contribution to the marginal rather than to the central elements of the process of teaching languages.

The challenge for supporters of CALL was to develop models that would integrate the various aspects of the language learning process. Fortunately, advances in computer technology were providing opportunities to do that.

The interactive and integrative theory of CALL, developed by Warschauer (1996), Pennington (1989) and Garrett (1991), is based on two technological advances of the past decade: the computers with multimedia technology and the Internet. This allows learners to browse at their own pace, simply by clicking, using the mouse. This type of integrative theory of CALL generated a large number of advantages for language learning.

CALL in the past decade stopped being a mere phenomenon in life and transformed itself into an indispensable tool for teaching modern languages. Along with other technological advances, such as video, the number of students who participate in the experience of CALL continues to increase speedily. Computer Mediated Communication (CMC), which has existed primitively since the 60 (Warschauer, 2000), spread only twenty years ago and today is probably one of the computer applications with a profound impact on the teaching- learning of languages. For the first time, students of modern languages can communicate directly and conveniently with

other learners or speakers of the target language all day, from their school, work or home.

CMC allows students to share not only brief messages, but also long documents which has therefore given way to and promoted collaborative writing¹. Thanks to CMC, students can actively participate in the search for authentic material from millions of electronic files, share graphs and tables, sounds and video, access Web pages. Students, within a short time, locate, and access various materials (newspaper and magazine articles, video clips, reviews of movies, lots of books, among others), taking, in this way, control of their learning. They can also use the web to publish articles or multimedia materials, with the aim of sharing with colleagues or the public.

In other words, CALL suggests and affirms that the computer has a variety of uses for language teaching: it can be a tutor, offering practical skills; it can be a stimulus or catalyst for discussion and interaction, or as a tool for writing and research. Garrett (1987) highlights the fact that “the use of computers is not a method but is an environment in which we can implement a variety of methods, approaches and educational philosophies”p70. In other words, the effectiveness of CALL is not in the medium itself, but how it is used in the process of language teaching and learning. This assertion by Garrett has much validity since the most important potential of the computer lies in its ability to provide an environment for language learning in which students are supported individually to develop, expand and refine their own language and communication skills in a new language. Computer Assisted Language Learning must be the focus of our efforts and without doubt, the development of their potential will significantly affect the way in which languages are taught and learnt in this century.

Teaching in this century has been combined with the use of assistive technological resources within which the computer has played a leading role by the benefits it incorporates, both for explaining concepts and for its appropriateness. As technology continues to advance, methods that are effective for the educational process have been sought.

Computers and Language Error Correction

Second language (L2) errors and possible ways to address them have been treated by different theories of L2 acquisition, having radically different views of the meaning of the language errors produced by L2 learners. For example, the behaviourist theory sees mistakes as a way of getting the wrong item and therefore should be avoided. Instead, interlanguage (IL) researchers (Corder, 1967; James, 1998; Muñoz, 1991) see errors as idiosyncrasies in the learner’s L2 system, and therefore are not errors according to the learner’s interlanguage, only for the target language, which is not exactly what the learner produces.

Error Correction

The error correction concept was proposed by Corder (1967), who was instrumental in the short-term revival of error analysis before subscribing to ‘idiosyncratic dialect’. He said that mistakes were evidence of the learner’s internal syllabus and imminent difference between the input (which is being taught) and output (what is being learnt). According to Corder (1967), errors affect the learner’s L2 competence. At the same time, he says that mistakes can be corrected and therefore also reflect student performance. These two concepts are based on Chomsky’s theory.

Error analysis is important for three reasons: (i) it informs the teacher about what

¹ This is a group of persons (or communities) who, using online communication (Internet) and by means of software tools (Blogs, World Press, Wiki, etc) make individual contributions to create a specific document.

should be taught, (ii) it informs the researcher on the learning course, and (iii) they are a result of hypothesis testing of the learner's L2 (James, 1998). It is considered that the sources of errors are the redundancy of the code (intra-language), several sources of interference (inter-language) and inadequate presentation. Grammatical awareness is an appropriate response to L2 errors that will help the student to pay attention to the linguistic structures of the target language and give him time to reflect on them. This trend is evident in linguistic awareness as well as in focus on form. The latter refers to a change of focus occasional on linguistic form in a lesson focused on meaning. An example of this is a paraphrase of an erroneous sentence spoken by the student, which follows the same student's intended meaning. Long and Robinson (1998) report a high effectiveness of this procedure - error analysis - especially with adult learners.

Allan (1999) stipulates that linguistic awareness has a strong emphasis on inductive learning with the objective of going beyond the grammar in the traditional sense. He defines the linguistic awareness and sensitivity of an individual and the nature of language and its role in human life; meanwhile, along with Ellis (1997) and James (1998), he makes the distinction between linguistic awareness and grammatical awareness. While grammatical awareness is responsible for focusing on what the student does not know, linguistic awareness is concerned to make explicit what is already known implicitly (James, 1998). Therefore, correcting errors (Corder, 1967) would concur with grammar awareness, and correcting faults with linguistic/language awareness.

Moreover, the Chomskyan concept of native speaker competence has led to the interaction hypothesis, a term used in reference to non-native speaker competence in contrast to native speaker's competence.

Chomsky (1965) asserts that there may be

strong or weak equivalence between two grammars. The weak equivalence allows both grammars to produce the same types of sentences. The strong equivalence, however, allows these types of sentences to have exactly the same meaning. The question of whether the grammars of native and non-native speaker may be weak or strong equivalent has not been resolved (James, 1998). This, however, has opened the door to doubt that a non-native speaker can ever fully master an L2, or, in other words, to reach ultimate achievement, which has also been shared by some researchers.

The eminently nativist conception of Chomsky, in fact, allowed little influence of linguistic evidence in language learning, especially in first language (L1) learning. Krashen (1987), as well as the other behaviorists, believes in the power of positive evidence in language learning. Positive evidence here means exposure to well-formed expressions. Gregg (2001) makes use of equivalent lines of distinction between positive evidence and the use of language on the one hand, and negative evidence and the words of the language; on the other hand, asserting as well that the use of meta-linguistic evidence is negative, if this confirms the hypothesis of the learner.

Gregg (2001) nonetheless concedes that the negative evidence in L2 acquisition most commonly means "to be alert to someone's linguistic errors." This can happen in many different ways and in varying degrees. Some followers of the interaction hypothesis, for example, believe in paraphrase as a remedy (Long & Robinson, 1998). Mitchell & Myles (1998), on the other hand, argue that despite the valuable negative evidence that it offers, paraphrasing does not require students to correct themselves. Apart from paraphrasing, research and theory on the types of correctness and effectiveness include the declaration of the relevant linguistic rules, the error rate indication without paraphrasing, the mere highlighting and

counting the number of errors per line, although comparison between these methods now appear inconclusive (James, 1998). Learners' preferences for certain types of correction also seem to vary, although it is not certain that the preferred correction method is most useful. It is, however, quite clear that learners want to be corrected.

Individual differences of learners also seem important in deciding how to execute the repair or correction of errors, but there is no general agreement among researchers in this case. However, there is a body of research evidence supporting the hypothesis that error correction is beneficial and necessary, and can lead to learning (Schulze, 2003; Gregg, 2001).

Most of the theoretical research of L2 acquisition, however, agrees that awareness is the crucial event in the correction of language errors and in learning. For James (1998), this supports grammatical awareness that is compared with the explanation of the unknown with what Krashen (1987) and Ellis (1997) designate as 'learning' (explicit or conscious) or the type of learning that is responsible for accuracy. Practice, moreover, which had been favoured both by the audio-lingual method, as well as the communicative language learning method, requires participatory attention. Therefore, it is thought that it can lead to acquisition, or unconscious learning (implicit), and fluency, which was highly valued by the audio-lingual approach. In fact, it is in high regard by the proponents of communicative language learning.

Therefore, noticing or awareness of errors invites a cognitive comparison (Ellis, 1985) between the interlanguage and the target language. As for Doughty (2001), this is a cognitive intrusion designed to allow planning between a conceptual and a new linguistic form under the influence of new pragmatic, semantic, syntactic and phonological information. James (1998) identifies this comparison as a form of error analysis, a procedure normally associated with the activity

of the researcher or teacher, not the student.

While advocates of the interaction hypothesis seem to use the terms consciousness, attention, and awareness interchangeably, James (1998) and Ellis (1997) make a distinction between them. According to James (1998), L1 awareness is another element of success in L2 learning. Linguistic awareness is caused by explanation, that is, something the student already knows implicitly, while awareness can be achieved from something previously unknown to the student. James (1998) believes that a coordinated approach to L1 consciousness and L2 awareness may lead to a better understanding of the L2 in terms of its parallels with the L1. Understanding how language functions in general seems to be the goal of this activity.

The development of the interaction hypothesis is closely related to the operating principles of Slobin (Gregg, 2001; Doughty, 2001), which refer to how students perceive, store and organize information about language. These processes are supposed to lead to positive transfer, an SLA theory which seems to complement the theory of contrastive analysis (James, 1998). Grammatical awareness, according to James (1998), serves its purpose when it gives the student the relevant rule in simple language. This allows the perception of the structure and understanding of the grammatical rule governing the production of linguistic structures.

The review of major points of view relating to errors and correction has made us aware of a multitude of psychological, philosophical and theoretical reinforcements towards research and practice of error handling. The analysis of some key terms used in this context by both the L2 acquisition and CALL could help put several proposals discussed within a wider framework of the history of human ideas.

Computers and Error Correction

Two trends are made obvious from the above discussion: first, the inconsistency of automatic test evaluators to assess the writing of native speakers on the one hand, and the writing of non-native speaker on the other hand, and second, the inability evident from the parsers designed to support the writing of native speakers to deal with non-native speaker or L2 language errors.

A number of CALL authors signal the latter as the main problem of probabilistic parsers, as those found in machine translation and word processing programmes (Tschichold, 1999; James, 1998). Tschichold (2003), in particular, identifies the lack of semantic, pragmatic and contrastive linguistic knowledge in such parsers as the root of its failure in helping L2 knowledge on which a foreign language teacher can rely.

The reason why the latest version of grammar check programmes of word processors has not found, for example, that the word "score" should be a noun instead of a verb when used more than once in a sentence, is because it does not look at the total sentence. Most likely, it concentrates on two or three adjacent words at a time and calculates the statistical probability for simultaneous co-occurrence in a text. This kind of parser is called a probabilistic parser (Smith, 1991). Liou (1991) highlights that feedback can be misleading because, as shown in some evidence, students tend to rely too much on computers (Holland, Maisano, Alderks, & Martin, 1993). Therefore, Intelligent CALL (ICALL) searches for other ways of dealing with errors of non-native speakers (Tomlin, 1995; Ferreira, 2006, & 2007).

No doubt that one of the most researched themes in the area of Intelligent Tutoring Systems (ITS) has been the identification and implementation of feedback strategies that facilitate student learning (Ferreira, 2006, & 2007).

Ferreira (2006) conducted an empirical study based on effective feedback strategies for the teaching of languages in e-learning contexts. Much of this research had been directed to dealing with procedural skills' teaching systems in areas such as algebra, physics or computer programming, etc. However, there has been little emphasis on studies and research on such strategies in language teaching (ITS for foreign languages). This paper reported on the design of effective strategies for corrective feedback ITS in foreign languages.

Empirical evidence was explored concerning the effectiveness of feedback strategies in a study based on the experimental design - pre-test/post-test and control group - in which students interact with an e-learning application. The objective was to provide effective guidelines for researchers who develop feedback strategies for ITS for foreign language learning. Two groups of corrective feedback strategies were investigated: Group 1, which included the repetition of error and explicit correction, and Group 2 considered metalinguistic keys and elicitations from the response of the student (without giving the response) (Ferreira, 2006).

Ferreira (2006) reveals that, in general, the results showed that the strategies of Group 2 (metalinguistic clues and elicitations) supported the teaching-learning process of the subjunctive in Spanish more effectively than the strategies of Group 1 (repetition and explicit error correction). After three weeks of the treatment process, the strategies, attempting to look for, extract or elicit responses about the sequence of tenses and subjunctive clauses, were statistically more effective in producing the correct forms in contexts that required the use of the subjunctive mood. Ferreira (2006:123) states, "Now, as the treatment period was relatively short (3 weeks) and also small number of subjects (24 subjects), we will have to conduct further studies to confirm the

trends have been observed in this work". However, despite these limitations, the study suggests that students of intermediate and advanced levels were supported in their learning more significantly by Group 2 strategies. It is proposed therefore that ITS for a foreign language should implement corrective feedback strategies that encourage students to correct themselves and their mistakes.

In another research done, Morales and Ferreira (2008) conducted an empirical study based on blended learning (face to face and e-learning classes) in which they provided effective guidelines for researchers who develop computer platforms for foreign language learning. The main objective was to visualize how the methodological principles from the language teaching approaches - Task-Based Language Teaching (TBLT) and Cooperative Language Learning (CLL) - could be applied effectively in the design of activities to develop language skills in e-learning and blended environments.

To this end, empirical evidence was explored about the effectiveness of learning English as a foreign language, in the face to face vs. blended modalities, in a study based on an experimental design - pre-test and post-test with control group. The results showed that the increase in learning English as L2 was higher in the experimental group that used a blended format than the control group who worked with the face to face modality. We propose, then, that models of blended learning methodology be included and implemented in the design of platforms for language teaching.

The use of feedback included in the platform *JClic*² for focus on form exercises strengthened the statement about the importance of using different strategies defined in CALL and ICALL applications investigated in studies which suggest that its use

increases second language acquisition (Ferreira, 2006, & 2007). By incorporating these strategies in this model, the student was able to reflect and analyze in depth the linguistic elements of the target language. In this case, the feedback was an aid for learning, by using the application in the non face to face moments (e-learning) periods. Also, as *JClic* platform provides different resources for presenting materials, students benefited from a richer input in relation to the grammatical form than what generally would be provided in traditional instruction.

According to the above, it should be noted that modern computer technology allows students to practise and get *feedback* on both their written and spoken *output* (Krashen, 1987). The spoken *output* requires the kind of evaluative technology that might not be necessary for the assessment of written output; often, it includes the analytical elements that characterize some of the computer support applications for writing. Therefore, the analysis begins with identifying the main trends that lead to errors and processing errors written in the context of CALL.

Written Errors

There are basically three ways in which a computer can identify and treat a written linguistic error, one produced by a L2 student in what is supposed to be the target language. You can perform a PAIRING OF FORMS operation, use a parser, or use a hybrid system, in which the analysis is combined with the enunciation in an efficient manner. The same grammatical analysis can be performed by a variety of parsers which will be subsequently identified. It can also vary depending on how it recognises and responds to errors. In addition, the system can have a component that allows you to address the linguistic levels of student *output* separately and therefore, perhaps in

² *JClic* is an authoring tool that allows teachers to easily create digital educational resources. The larger user base within which his predecessor had, *Click*, will certainly be expanded as *JClic* to create greater variety of activities, with new features and to create resources whose display is not restricted to any particular operating system.

a more efficient way (Yoshii & Milne, 1995). These and other related issues will be discussed below.

The pairing of forms (Yoshii & Milne, 1995) is based on matching patterns of enunciations of the student's output with a list of expected and pre-recorded responses. The statements are "contiguous sequences of characters that the application designer might want to find in the student's input" (Yoshii & Milne, 1995, 64). The question is, however, whether this could be considered intelligent CALL, since there is no parser or other device usually associated with intelligent behaviour. Given that the system is nevertheless capable of great flexibility and is free from discrepancy in word choice, the part of speech or inflection, it can give the impression to users that it really "understands" their *input*, in which case it passes the *Turing Test*³ and can be classified as intelligent.

The primary objective of a parser is to decipher whether a sentence is grammatical, i.e. whether it conforms to the rules in the grammar of the parser. The uses of parsers are varied, including CALL applications, grammar and articles of other writers, translation software, dialogue systems, document retrieval and automatic extracting of main ideas. Even though the most sophisticated systems use the semantic pragmatic and topical analysis, as well as parsing, Holland et al. (1993) believe that "they are the abstract linguistic rules which give the natural language processing power to handle a huge range and variety of text input" p30.

The parsers in CALL can allow for language production, rather than a mere reception, and analyse a variety of sentences that do not have to be pre-programmed into the system. However, as should be the case in the pairing of statements that is quite remarkable, they also have a number of limitations. First, parsers rarely go beyond syntax -

focus on form rather than meaning (Holland et al., 1993) - and this seems to break down the objectives of communicative language learning is presently the prevailing theory for L2 acquisition. Second, parsers are not infallible and may well fail to catch mistakes or recognize a completely correct sentence as such. Finally, the development of parsers and systems capable of using them is very expensive. This may be the main reason why we see relatively few of them in actual use with regard to CALL.

"One way to improve the efficiency of parsers is to use techniques that encode uncertainty, so the parser does not need to select an arbitrary choice and later on retreat" (Allen, 1995). RETREAT is a procedure by which a parser can return to a previous state in the analysis if the chosen path does not seem to lead to successful parsing. With reduction parsers change, uncertainty or ambiguity is passed along to the point where all possibilities, except one, can be eliminated.

This technique was developed to complement grammars designed for artificial languages so that they do not have any ambiguity and therefore only one interpretation is therefore possible (Allen, 1995; Tomlin, 1995; Ferreira, 2006). Because of the typical nature of ambiguity of the human language, such techniques help to avoid incorrect analysis or the need to delay a number of steps and thus slow down the process. The reduction parsers instead have the ability to look forward to the information that can resolve ambiguities and are, therefore, fast and efficient.

The complexity is the nature of the systems that want to deal successfully with human language. The parsers alone often can handle a lot of language in terms of structures, but they may not be able to test, for example, if a response provided by a student has the right content

³ Turing test called the procedure developed by Alan Turing for the existence of intelligence in a machine. The test consists of a challenge. The machine has to impersonate human in a conversation with a man through a chat-style text communication. The subject did not warn you if you are talking to a machine or a person. If the subject is unable to determine if the other party of communication is human or machine, then it is considered that the machine has reached a certain level of maturity: it's smart.

included. While some systems build artificial constraints as to what input to allow, other systems use domain knowledge for verification of content. Two examples of this system are described below.

The favourite example of Desmedt (1995) of an ICALL parser system that works on multiple levels and surely captures a series of errors of learners is the murder mystery game set in the Amber Productions "Herr Kommissar," designed for intermediate level German learners (Desmedt, 1995). The role of the learner in this game is to interrogate suspects in a murder case. According to Desmedt (1995), this task is not only a communicative immersion, but also allows the teaching and learning of languages through tasks, where language is used meaningfully to accomplish an extra-linguistic mission. The fact that the focus is on meaning, as suggested by Doughty and Williams (1998) and Long and Robinson (1998), may cause automatism in the use of linguistic form deemed necessary by some researchers (Ellis, 2001; MacWhinney, 2001).

Therefore, the intelligent identification of errors and diagnostic systems, with regard to written language, can be quite sophisticated and use a number of subsystems combined with a variety of processing levels, making them almost human and truly intelligent. Immediately below, reference will be made to the oral production language skill and how it can be articulated and evaluated, using speech processing technology.

Conclusion

The development of new technologies in recent decades has led us to reflect on the possibilities that multimedia technology can bring to foreign language teaching with its advantages and limitations.

In recent years there has been a breakthrough in the use of computers applied to CALL. Until only a decade ago, the use of computers in the

language class was something that was relegated to a few specialists in the field. However, with the development of multimedia technology and the increasingly widespread use of the Internet, the role of computers in the foreign language classroom has become a major issue in which an increasing number of teachers around the world are becoming involved.

Education is required to address this new reality, accepting the possibilities that new technologies are offering and knowing how to guide their implementation positively to avoid imbalances generated by a purely mechanical and comfortable use. In this society, more important to remember is to teach students the strategies to select and access information according to their needs. Thus, we have to find a way to reconcile the force the world of images is occupying in our society, with the need to train people who are fully autonomous and critical thinkers.

We can say that technological change has paralleled the evolution of the different foreign languages teaching methodologies in a positive and important effort to adapt to the possibilities that the society offers at all times. If the mainframe was the technological base of behaviourist CALL, the personal computer would be the technological base of communicative CALL. Presently, multimedia computers are the technological foundation with which integrative CALL functions. Currently, multimedia technology offers a variety of information, production and communication tools; in fact, it also provides the possibility for a much more integrated use of technology. This is good news for both teachers and students. Indeed, one of the fundamental characteristics of the modern world in which we live is that there is always an inescapable need to learn to read, write and communicate through the computer in any area of our lives.

It is sufficiently clear that multimedia technology offers, no doubt, many advantages. It encourages the process of foreign language

learning, which always requires a long and continuing effort by the student, in the sense that it provides many opportunities and facilities to get a better performance in this effort, while adapting to the individual learning pace of each student. It helps to develop, especially, oral and written comprehension, vocabulary acquisition and retention, and it also helps to improve pronunciation.

On the other hand, we must also recognize that multimedia technology still has many limitations, mainly in regard to value and correct the very language productions of the student. In this sense, the development of oral and written expression, fundamental in achieving communicative competence in foreign languages, is an issue that CD-ROM programmes only deal with superficially. For this reason, the higher the level of foreign language skills by the student, the greater the need is to increase face to face teaching which would allow you to practise something as important as conversation. The progress in voice recognition software and oral interaction with the computer, already being developed, will contribute progressively to remedying this deficiency.

Overcoming what we call integrative CALL will come from the hand of what is becoming known as Intelligent CALL, and it will give more and more satisfactory answers to the challenges that arise in the near future to get an increasingly active, simple and straightforward interaction with the computer and its usefulness. It is necessary to investigate the use of multimedia technology taking into account what is known about language acquisition and especially learning strategies. Thus, we will be able to identify to what point, to what extent and how new technologies promote the teaching and learning of foreign languages.

It would also be necessary to delve into issues such as the type and amount of interaction that is generated using the computer, what students and teachers think about technology and how

they use it, what are their attitudes towards the media, and investigate about their effectiveness in developing the four language skills. Meanwhile, we must continue working with the many media that technology has put at the service of education. And it seems that, ultimately, the question before us is not “what is the role of multimedia in foreign language class”, but rather just the opposite, “what is the role of the foreign language class in this technological age of information?” Perhaps the only possible answer is that we must prepare our students to work and function in a digitally connected society, where most communications will take place in the target language.

New technologies applied to education should, therefore, help to develop different learning opportunities for students and, consequently, teachers must be the first to accept them as an increasingly indispensable tool for our educational work, but without fear that in no case can they become a substitute for language teachers.

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