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## LANGUAGE TEACHING METHODOLOGIES IN COMPUTER-ASSISTED LANGUAGE LEARNING : A PROSPECTIVE REVIEW

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### Résumé

Cet article propose une revue prospective des préceptes fondamentaux, des méthodologies d'enseignement des langues développées au 20e siècle et une évaluation de la mise en application de ces préceptes dans l'apprentissage des langues assisté par ordinateur. Dans la première partie de cet article, je présente une revue sélective des méthodologies d'apprentissage des langues, et les grands principes théoriques linguistiques et de l'apprentissage qui les soutiennent, en plus des préceptes psychopédagogiques qui les distinguent, incluant la théorie constructiviste, plus récente, qui n'a pas encore mené directement au développement de méthodologies d'apprentissage du langage. Dans la deuxième partie de l'article, je commente sur le potentiel de l'apprentissage des langues assisté par ordinateur à satisfaire les différents préceptes de l'enseignement des langues en particulier, et les facteurs psychopédagogiques impliqués dans le processus d'apprentissage en général. Une des principales conclusions indique que, tout comme les méthodologies d'enseignement des langues ont évolué d'un modèle où la connaissance était transférée d'un expert à un novice, nous ne devons pas voir la technologie comme simple source et transmetteur d'information, mais comme un outil permettant d'accéder à de l'information, de la manipuler, et de communiquer avec les autres, et donc de construire la connaissance.

### Abstract

This paper proposes a prospective review of fundamental precepts of language teaching methodologies developed in the 20th Century and an assessment of whether and how computer assisted language learning (CALL) can meet these precepts. First, I present a selective review of language learning methodologies and the main linguistic and learning theory principles supporting them, as well as psycho-pedagogical precepts that distinguish between them, including the more recent Constructivist theory which has not yet directly led to the development of language learning methodologies. In the second part of the paper, I comment on the potential that CALL has in meeting the various precepts of language teaching in particular and psycho-pedagogical factors involved in the learning process, in general. One of the main conclusions is that just as language teaching methodologies have evolved away from a model where knowledge is transferred from an expert to a novice, we need to view technology not so much as a simple source and transmitter of information but as a tool to access and manipulate information and to communicate with others, e.g. a tool to build knowledge.

### 0. Introduction

The evolution of language teaching has traditionally been influenced by the advancement of new language teaching pedagogies and more recently, by technological changes. There is now a relatively new field called Computer Assisted Language Learning (CALL), which explores the potential of technological applications to language teaching. But as Adriaen (2002) and Murray (1999) comment, it is important to fight the tendency to simply introduce technology in our old pedagogy: there is a need now for experimentation with innovative learning structures. However, an important question is, Where to start? The purpose of this prospective review is to address this question in two steps:

- Consider which fundamental precepts of the main language teaching methodologies developed in the 20th Century should be taken into account in developing CALL
- Assess whether CALL can meet these precepts and if so, how.

I will start by reviewing the main approaches to language learning/instruction that have been proposed in the 20th century, focusing on the main linguistic and learning theory principles behind them as well as important psycho-pedagogical precepts that distinguish between them, such as the respective role of learner and teacher. Upon summarizing the main aspects of the various methods, I then compare them to the more recent precepts of the Constructivist theory of learning, a cognitive theory of knowledge acquisition, which has not yet directly led to the development of language learning methodologies. In the last section, I comment on the potential that CALL has in meeting those various fundamental precepts about language teaching in particular and psycho-pedagogical factors involved in the learning process in general.

#### 1.0 The origin of CALL: Language teaching and Technology

Language teaching has gone through various important trends over the 20th century. Essentially, those trends reflected developments in philosophy, linguistics, psychology, theories of learning and psycho-pedagogy. What resulted is the emergence of a great number of language teaching methodologies, such as the Audio-lingual approach (Brooks 1964), the Communicative approach (Allwright 1977, Brumfit & Johnson 1979 Breen & Candlin 1980) and some less traditional or popular such as the Silent Way approach (Gattegno 1972), The Community Language Learning approach (Curran 1976), the Natural approach (Terrel 1977, Krashen 1981), the Total Physical approach (Asher 1969), the Suggestopedia (Lozanov 1978) among others etc.

Parallel to the development of these language-learning methodologies, computer-assisted language learning (CALL) progressed under the influence of technological developments. In fact, computer-assisted language learning was envisioned as far back as the Second World War. However, according to Delcloque (2000) it is not before the 60's, with the Stanford Language project, and the birth of hypertext, that CALL actually became a reality. Technological limitations, until then, were just too limitative for language learning and were reduced to some very specific, small projects. With the formidable expansion of the personal computer in the 80's and 90's however, the technology caught up and allowed some applications of CALL to develop. However, most developed programs were enhanced copy and paste applications of material that already existed under a written form, e.g. grammar texts divided in chapter with series of exercises. While CD-ROMs and online access language programs (e.g. *Vis-à-Vis* 2004) provide some benefits over a course manual, e.g. auto-correction of exercises and automatic grading as well as some audio support, in essence these programs are not an improvement over manual versions and brought nothing new to the learning environment.

There has been only few exceptions to that, to which we will come back in a section below, but the vast majority of the material developed for language teaching did not seem to exploit the medium of multimedia as an original, unique environment with its own advantages and flaws. In particular, no definite effort was made at developing programs that took into account psycho-pedagogical factors inspired from language teaching theories and methodologies. This state of affair is bound to change however and signs are visible, as more powerful and accessible multimedia tools are becoming accessible to students, schools and language laboratories, putting pressure on the need to develop adapted and effective computer-assisted language learning tools which yield improved results.

In the next section I review the main language learning approaches listed above and summarize their main theoretical and methodological characteristics. The goal here is to gather a list of the main psycho-pedagogical factors that ought to be considered in a language learning methodology, which I will later use in discussing their role in CALL.

#### 1.1 Language Teaching Methodologies and Theories of Learning and Linguistics

Language teaching methodologies have been greatly influenced by developments in the theories of language and theories of learning. In order to excerpt the main psycho-pedagogical aspects of these methods to eventually assess them for the CALL environment, I will review the main aspects of the most influential teaching methodologies that have been developed, focusing on the linguistic and learning theories behind them as well as the role of the teacher and learner for each of them.

##### 1.1.1 Oral Approach or Situational Language Learning

The very first approach in the 20th century, called the Oral Approach or Situational Language Learning teaching methodologies in particular have been greatly influenced by developments in the theory of language. For instance, the American school of structuralism in linguistics (Bloomfield 1935) led to the development of the Audio-lingual approach, very popular during the 50's and 60's in America (Palmer 1923, Hornby 1950). It was inspired by the work of early structural linguists (such as Jespersen, Jones) who broke with the classic tradition of studying written language such as Latin, German, French, etc. at the expense of oral languages. The theory of learning behind those approaches was a type of behavioral psychology, whereas language is learned through selective stimuli and repetitive patterns. As Frisby writes:

"There are three processes in learning a language- receiving the knowledge or materials, fixing it in the memory by repetition, and using it in actual practice until it becomes a personal skill" (1957:136)

The role of the learner, in the initial stages, is reduced to listening and repeating what the teacher says. The learner has no control over the environment or the stimuli and production of faulty forms is corrected to prevent falling into incorrect habits. Only later is the learner encouraged to participate more actively, but always under the supervision of the teacher.

The role of the teacher is one of skillful manipulator, using questions, commands and other stimuli to make the learner produce correct sentences. The learning process is greatly teacher-oriented.

### **1.1.2 The Audio-Lingual Method**

This method can almost be thought of as the American version of the Oral and Situational approaches described above. Both are influenced by the structural linguistics tradition and put emphasis on the oral function of language: language is speech. First developed by the US army during the Second World War and the subsequent cold war, its focus was on speech-based instruction and the primary goal was oral proficiency. There is no particular name associated with this approach, though it led to the development of such widespread language methods such as *Lado* (Lado 1977) and *English 900* (English Language Services 1964). The study of oral texts or grammars is basically forbidden. The learning theory behind the Audiolingual methods was strongly influenced by the American behavioral school of psychology: Repeating drills of dialogues form the basis of the classroom material. There were 4 basic learning principles behind this method (Richards&Rogers, 1987: 51):

1. Foreign language learning is basically a process of mechanical habit formation. Good habits are developed by giving correct responses rather than by making mistakes.
2. Language skills are learned more effectively if the material in the target language is presented in oral form, rather than written form.
3. Analogy provides a better foundation to language learning than analysis. Explanation of rules are therefore not given until a student has practiced a pattern in a variety of contexts and are thought to have learned the analogies involved.
4. The meanings that the words of a language have for a native speaker can only be learned in a linguistic and cultural context and not in isolation.

The role of the teacher is central and active: he or she is the model, controls the pace as well as the content of the learning, is responsible to keep the learner focused and attentive and monitors his performance.

The learner is viewed as an organism that can be trained to produce correct language responses. According to the behavioral approach, teaching focuses on the external manifestation of language production, and not on the internal processes involved. The learner is not encouraged to initiate interaction, as it may lead to mistakes.

### **1.1.3 Communicative Language Teaching**

The Communicative approach was partly a response to numerous criticisms directed at the structural linguistic theory, in particular by Noam Chomsky (1957). Chomsky basically pointed out that the structural approach failed to explain fundamental properties of languages –the creativity and the uniqueness of individual sentences. In addition, important work in the philosophy of language (Searle 1966, Austin 1962) and functional linguistics (Hymes 1972, Firth 1957) emphasized the need to also focus on the communication function of languages, and not so much on the simple mastery of language forms. According to Littlewood (1981: 1) "One of the most characteristic features of the Communicative language teaching is that it pays systematic attention to functional as well as structural aspect of languages". The communicative approach also emphasizes on "...the need to work in pairs or group, employing available language resources in problem-solving task" (Richards and Rogers 1997:66).

Contrary to previous approaches, there does not seem to be any specific learning theory that inspired the communicative approach. Neither Brumfit and Johnson (1979) or Littlewood (1981) discuss any learning theory approach. Yet, one can find in their methodology some strong learning principles. For instance, the belief that activities that involve real communication, as well as activities in which language is used to carry out meaningful tasks, promote the language learning process (Johnson 1982). Also, language that is meaningful to the learner supports the learning process. These general principles emphasize the need for language learning to be meaningful and to reflect authentic language uses.

The role of the learner in the communicative approach is very different from previous approaches. As Breen and Candlin (1980:110) describe it:

"The role of the learner as negotiator –between the self, the learning process, and the object of learning- emerges from and interacts with the role of joint negotiator within the group and within the classroom procedures and activities which the group undertakes. The implication for the learner is that he should contribute as much as he gains, and thereby learn in an interdependent way."

The learner is thus expected to interact primarily with the other learners rather than with the teacher. The teacher role in turn, is multiple. Breen and Candlin (1980:99) describe it in the following way:

"The teacher has two main roles: the first role is to facilitate the communication process between all participants in the classroom, and between these participants and the various activities and texts. The second role is to act as an independent participant within the learning-teaching group. (...) A third role for the teacher is that of researcher and learner, with much to contribute in terms of appropriate knowledge and abilities, actual and observed experience of the nature of learning and organizational capacities."

### **1.1.4 Community Language Approach**

Developed by Charles A. Curran, a psychologist who developed a theory of Counseling Learning based on counseling techniques (Rogers 1951). Curran extended his theory of learning to language teaching. In the language teaching tradition, the Community approach is also known as the "humanistic approach" as it mainly focuses on the emotional experience of learning as it occurs in counseling sessions. Counseling, as a Rogerian sees it, is one person (counselor) giving advice, assistance and support to another who has a problem or is in some way in need. The "problem" is to learn a language in this approach, and the teacher is the counselor helping the learner achieve this task.

As in a Rogerian group therapy, language learners become members of a community –their fellow learners and teachers- and learn through interacting with members of that community. Learning is not viewed as an individual accomplishment, but something that is achieved collaboratively. Learners are expected to listen attentively to the "knower", to freely repeat utterances, to support fellow members, to report their feelings through the experience, either of inner frustration or joy and pleasure, and to also become "counselors" to others.

The role of the teacher on the other hand will resemble the one of a counselor: he or she will respond calmly and non-judgmentally, in a supportive manner, and help the learner understand his or her problems better by applying order and analysis to them.

It should be mentioned that the language material presented is fairly traditional in form: Curran was not a linguist or language teacher by training. Rather, the innovative aspect of this method is how the process of learning is happening. This method, more than any other described here, focuses on the teacher's responsibility for creating and maintaining an emotionally "safe" and productive environment for learning.

## **1.2 Summary**

The four approaches briefly described above each represent a sample of the various factors that have been considered as most important in the teaching of language. We can roughly divide these methods in two groups, according to the role of the learner and the teacher.

A. Teacher: active, in control, model, animator.  
Learner: passive, repeats forms, individual learning, non interactive

B. Teacher: facilitator, participant, counselor, learner, model.  
Learner: active, negotiator, works in community, collaboratively.

The A group corresponding to the Audio-Lingual and Situational methods, are more traditional and have for the most part been abandoned, though aspects of these methods remain present in contemporary approaches, e.g. the focus on grammar. The B group, corresponding to the Communicative and Community approaches, are associated with the innovative language methodologies. According to contemporary pedagogical beliefs, the role of teachers and learners in the B group above is definitely preferable. That said, it doesn't mean that the Group A methods are completely obsolete: The tendency over the years seem to have been to mix different aspects of all these methods.

In addition to the roles of the participants defined in the B group above, the following is a list of the fundamentals of the language methods described above:

- The need to focus on the communication function of language as much as on its structural or grammatical properties

- The need to repeat the learning activities to develop the proper skills
- The need to learn from real communication and from meaningful activities
- The need for collaborative or community learning and social contacts
- The need for an emotionally safe, supportive environment

I will come back on those aspects directly and assess how a CALL environment can possibly fulfill them. Before doing so, it is worth pointing out how the more recent learning theory of Constructivism fares with respect to these language learning fundamentals.

### 1.3 Constructivism and Language Learning

Before doing so, it is interesting to note that the fundamental aspects of various language-learning approaches summarized above strikingly correspond to fundamentals aspect of the Constructivist learning theory. Incidentally, no language teaching method has yet claimed the Constructivism theory as their learning approach. Perhaps this is because parts and pieces of Constructivism were inherent in each of the methods that were developed in the past. If that is right, then Constructivism would be the a way to approach all these different approaches under the same umbrella.

Constructivism – or Constructionism as it is also known – is not an instructional model but rather a theoretical framework to understand learning and knowledge. Its roots go back to the works of Jean Piaget (1956) and Lev Vygotsky (1978) and the functionalism of Michael Halliday and now expressed in the work of Gergen (2001) and other social psychologists. It is based on two fundamental principles:

1. Knowledge is constructed by an active learner
2. Knowledge is socially constructed.

For the constructivist, knowledge is not transmitted from an expert or teacher to a passive recipient, the learner. It results from a cognitive activity of meaning-construction. The learner is engaged in the construction of mental representations of the material to which he or she is exposed, and trying to make sense of it. Knowledge therefore results from the actions taken by the learner, usually in a problem-solving activity, and from reflections on those actions.

Knowledge is also linked to social interaction. The social construction of meaning is indeed an important feature of constructivism. Although our understanding is unique and individual, we can consensually agree to a shared understanding by dialoguing with others. In the classroom environment, the social construction of meaning is instantiated by collaborative work and social discussions among learners. Learners interact with other learners and other participants in the learning environment to form and test their constructs in a dialogue. Learning does not occur in isolation but rather within a "learning community".

Even though no specific method has been developed precisely for language teaching, there are a number of instructional models based on constructivist principles: situated cognition, cognitive apprenticeship, problem-based learning, micro-worlds, and cognitive flexibility theory, to name just a few. They share some important features including (from Adriaen 2002:145):

- *a focus on the learner*: learners take responsibility for their learning; they become the architect of their learning process; the environment is learner-centered;
- *a new role for the instructor*: the teacher must mediate between learners' current and emergent understandings; he or she becomes a guide, a coach, a facilitator;
- *an emphasis on higher-order cognitive skills*: knowledge-construction is inductive and deductive; critical thinking, evaluation, logic, problem-solving, reasoning, hypothesis formulation and testing, and communication are all developed.

It already must be striking to the reader how the role of the learners and teachers described in the previous section, as well as the main aspect of language teaching methodologies, seem to be converging with the basic principles of Constructivism. The teacher role in group B is one of facilitator, participant and negotiator. The learner roles in Group B require him or her to be active and directly implicated in the learning process and work collaboratively. In addition, the needs for real communication, community learning and social contacts described in the Communicative Approach are central to Constructivism. We can also speculate that the need for a safe, supportive environment described in the Community Method is a natural extension of Constructivism, insofar as efficient community work does presume an emotionally positive and supportive collaboration (by opposition to a conflicting or judgmental one).

Even some of the traditional focus of language teaching methods find a niche in Constructivism: The need to focus on the communication function of language as much as on its structural or grammatical properties can be met with properly designed exercises fostering knowledge construction, critical thinking, problem-solving, reasoning, hypothesis formulation and testing and communication.

When it comes to language teaching, Adriaen (2002:143) claims: "The use of technology in language teaching and learning still has to deliver on the pedagogical benefits vaunted by its enthusiasts. Technology's full potential as yet to be harnessed". Adriaen further suggests that "...an important –some might think *radical*- change in pedagogical practices needs to take place (...); ...there needs to be a shift to technology to support *learner* goals rather than *teacher* goals (...) to learn *with* technology rather than *from* technology".

## 2.0 CALL and Fundamentals of Language Learning Methodologies

In the next sections, I reconsider the fundamentals of language learning methodologies described above and offer a preliminary assessment as to how they could be served in a CALL environment. I conclude the discussion by considering another important psycho-pedagogical factor that we did not address so far, namely Cognitive Overload. I offer some remarks on its role in a CALL environment and how it relates to the use of hypertextuality.

### 2.1 The need for social contacts, community and collaborative work

Social contacts can potentially be fostered by a number of means in a CALL environment. Karsenti (2001) discusses 9 different ones: email, electronic boards, discussion forums, discussion groups, email lists, various chat program (ICQ "I seek you", CNTR-CHAT, Messenger), Web audio conferences and the CuSeeMe ("see you see me"). According to Karsenti, group discussions are among the most popular; they make the student feel more involved in the course. Small group work projects allow developing a working collaboration, whereas large forum discussion allow for a community sense of learning, as described in the Community and Constructivist approaches. For instance, a student can receive a question of the professor via another student and reply to any question that is being raised, just as in a real classroom environment.

However, as far as language teaching is involved, the biggest drawback of chat rooms and forum is that mainly written language can be used. This is quite a shortcoming for people who want to take a language course in order to actually speak a language. Web cam conferences or audio technology could possibly be put to use in that respect, but there doesn't seem to be any oral language teaching courses systematically based on those technologies available at the moment (but see section 2.3 for an experimental project under development at Simon Fraser University). Some CD programs have been developed for audio purposes, but none of them allow a language interaction between the learner and the program. Basically, the learner can listen to proper language forms and try emulating them (CAN8 is such a program). These CDs are more or less as useful as the traditional 'language tapes', under a more modern and user friendly CD format which allow more interactivity between the learner and the language material.

That being said, all hope is not lost: There is much application to be found for written language learning. Grammar and stylistic courses can definitely profit from computer-assisted language learning. In an interesting study of asynchronous discussion forums for language learning, Stephen Carey (1999, 2000, 2001) and Nathalie Grant (2001) have present results of a qualitative study showing the benefits specifically for second language learners: Discussion forums provide learners with time to formulate their question (which they may be too shy or lacking confidence to do in a live class), to process other's students requests and overall, improve their written skills by having to use the written medium to communicate. Since they want to be understood, and since they are being "observed" by their peers in their writing, students will take the time to look up for that word, or that rule, to produce a better-written message. In sum, discussion forums are a good example of how technology can be used to provide a social environment that students can learn *with* and not simply *from*, emulating the need for social contacts and a communicative and collaborative environment.

### 2.2 The need for an emotionally safe and supportive environment

The type of virtual social environment created by discussion forums or chat rooms can also have positive effects on introverted students' personality. Posting a message in a forum or in a chat room can be much less 'threatening' to a student who is socially shy. Students who never participate in class may be more inclined to do so in a virtual class environment and develop a confidence that could carry over to the real class environment. This stresses out the important of the teacher-moderator in these forums in securing an emotionally safe environment. Much research needs to be done concerning this aspect of CALL, as there seems to be very little, if any, study trying to measure the impact of computer-assisted learning on the psychological attitude of learners. Most studies we found (e.g. Kenyon & Malabonga 2001, Krendl & Broihier 1992, Mitra & Steffensmeier 2000, Smith, Caputi & Rawstorne 2000) were not for language learning per se. The only language-related work was Peters (2004), a qualitative study based on a student survey of their experience in a computer-assisted second language course. The study explores the student's interest in using technology in a language course as well as their patterns of use of

various multimedia tools. The study however does not touch on the emotional experience from a learner-environment standpoint. To our knowledge, no comparative study has quantitatively measured the impact of CALL on the learner's emotional behaviour.

### 2.3 The need for real communication

Another interesting psycho-pedagogical aspect to consider is real communication, as ascribed in the Communicative approach. Can it be said that the forum and chatting environments are real? Insofar as they are involving real people having real discussions, one can certainly say they are. What is less real however is that the environment is one involving novice learners interacting with novice learners and having no contact with native speakers, as it happens in a real world situation. However, that critic is not specific to CALL. Traditional language classrooms suffer from the same shortcomings and only real language immersion seems able to circumvent that. I am however aware of one interesting experiment attempting to narrow the gap between classroom and real immersion environment. It is conducted by language teachers and researchers from Simon Fraser University (Claire Trépanier and David Kaufman) and University of Quebec in Montreal (Tom Cobbs) and is called *Virtual Immersion*. The experiment uses new mobile technology and multimedia (web cam) in allowing students to learn each other's native languages in real time and in a real situation. The students are paired and follow their partner in their excursions or experiences, seeing all that his partner sees and dialoguing with him or her, as if they were together physically. Abstracting from the cost related to this type of interaction, one could see its potential. It certainly opens the possibility of allowing more real communication in a computer-assisted language-teaching environment.

### 2.4 The need of repeating the learning activities to develop the proper skills

Language learning requires practice, that is simple a fact. That certainly is an area where computer-assisted language learning can be very useful. A good example of this is CAN8, a program specifically developed for teachers and programmers specialized in language teaching. CAN 8 is a program shell without language content, but with tools that can be used by language teachers to develop their teaching material for any language in a multimedia environment. In this way, it resembles course-managing programs such as WebCT, Learning Space and V-Class, with the difference that CAN8 is specialized for language learning.

Drill exercises are very naturally developed with programs such as CAN8 and their F-type window ("F" for fill in the blanks) or M window ("M" for multiple choice) (Richard 2002). CAN8 has also been exploited for its potential for phonetic correction (Bouffard 2003), allowing learners to listen to a model recording and immediately record their own production, and thereafter being able to compare both and repeat the process as many times as necessary. Bouffard discusses some ergonomic issues in the utilization of this particular program, but the technology is definitely providing an excellent learning tool.

While there are very few shell programs available to instructors for language teaching, there are numerous language instruction programs on CDs or accessible online. But as we pointed out earlier, these programs are basically traditional language workbook being offered on a CD-ROM platform. There are some benefit to that medium of course, as they allow auto-correction and auto-grading, and in certain case, audio-visual material but for the essential, these are not different from traditional book or tape language packages.

### 2.5 Cognitive Overload

One of the typical mistakes that young teachers do is to put too much information in a given course unit. According to Kirch (2000), this creates a sensation of frustration or even anxiety and ultimately, a desire to get out of the situation and a certain confusion, certainly not the best dispositions for learning. There are in reality two ways to transmit information: a) in organizing the information in a hierarchical way, leaving the choice to the learner of choosing what he or she might need b) by presenting a great quantity of information simultaneously. In the later case, individual thresholds of tolerance can make the difference between a pleasant experience or a cognitive overload.

Now if we are to take constructivist principles into consideration, great care should be taken in not creating cognitive overload. The student must be able to construct knowledge from the pedagogical material by opposition to being confused by it. For instance, the learner must be able to formulate hypotheses and verify them, build up his knowledge from previous knowledge acquisition and be able to have access to all information he might need to pursue his or her knowledge building. In the absence of a direct teacher who can guide the student in his quest, it is the design itself of a course that has to fill in that role.

If we considering CALL, graphic design certainly plays an essential role, as bad design can contribute to cognitive overload. For instance, according to Lonfils & Vanparys (2001), if the design is inconsistent, by introducing unjustified color or font changes, the learner will experience a cognitive overload since he or she will try to interpret these changes as significant, searching consciously or not for a justification. Laboz (2001) suggests a great use of « metaphors » for Internet sites for example, that is, themes which are repetitive in the site, such as background colors and navigation, tools, so that the learner becomes rapidly familiar with the environment.

An interesting instrument specific to computer-assisted learning can play an important role when it comes to cognitive overload. According to Beaudoin (2003), *hypertextuality* can be defined as the capacity of inter-linking different parts of a text, thereby rendering possible the shift of perceptual attention of the reader from a starting element to a targeted element. In the realm of education, there are three basic types of usage for hypertextuality (Nanard, 1995; Chanier, 2000): a) the extraction of information from a data basis b) the organization of existing information c) the production of information and structures of new information.

Beaudoin goes on in pointing out that hypertextuality is non-linear by nature, being the simultaneous product of a source of information and a process that links the information together. Despite the attraction of seeing hypertextuality as a model of thoughts processing, it is different from it in that it is but one mode of human thought processing: free association and linear thinking, for instance, are not readily compatible with hypertextuality.

It is clear that a proper integration of hypertextuality in documents can greatly limit the cognitive overload. For instance, it allows to narrow-stream the focus of a discussion, permitting the reader to access background or related information at a later processing time. On the other hand, there is also a danger of disorientation and loss of focus in allowing too many sequences of links. An excellent example of proper use of hypertext for language learning is described in Bougaief's *Annotation* (2002). *Annotation* is a program developed by Bougaief to help French second language learner (FSL) to (re)-discover the pleasure of reading in a second language. One of the most difficult challenges, if not discouragement, facing a FSL is to constantly come across new words in a text. A single word can make a whole sentence incomprehensible, and considerably slow down the reading process if the learner has to look for every new word in a dictionary. According to Bougaief, this can be a laborious task that steels away the simple pleasure that can come from reading a text. *Annotation* is basically a set of chosen literature texts that contains hyperlinks to a database for every single word. If a learner comes across a new unfamiliar word, the latter can be clicked on and a pop up window appears with the proper contextual meaning for that word. This allows the learner to acquire the meaning of the word very quickly and keep the flow of his main task of reading relatively undisturbed.

In sum, if used efficiently, hypertextuality has the potential to greatly enrich a document, allowing the learner to build or construct his knowledge at his or her own pace, thereby preventing cognitive overload.

Lastly, among the strategies to circumvent overload, the creation and careful choice of work group members in an online environment is certainly very important. For instance, mixing students with different levels of experience with computer-assisted learning can help students exchange and learn from each other in small groups, helping to overcome the peculiarities of a given program or task to be accomplished.

### 2.6 Other Factors

So far the discussion has not taken into accounts a number of factors that are assuredly important in the process of learning and therefore, should be factored in for an integrated CALL environment. I will touch on two of them briefly here.

One such factor is learning styles. Briggs-Myers proposed one of the first taxonomies of learning styles. Learning styles describe different ways in which a learner learns, which can be very helpful for an educator when considering different ways of presenting educational material. The model proposed by Briggs-Myers is very popular because it is precise and descriptive. It is, however, more complex than others than have been subsequently proposed. For instance, the model proposed in Kolb (1976) describes four basic types of learners, instead of the sixteen proposed in Briggs-Myers. The four learning styles of Kolb are:

**Experimenter: active-concrete**

Typical question: What would happen if...  
Loves to explore, to discover links between concepts

**Innovator: concrete-reflexive**

Typical question: Why  
Loves to discover from detailed and organized information

**Conceptualizer: abstract-active**

Typical question: How

Loves problem resolution and doing exercises

**Observer: reflexive-abstract**

Typical question: What is there to know?

Loves systematic studying and does not dispute the transmitted knowledge

Each learning style commands preferences and individual habits as to how learning happens. It is therefore very useful, as an educator, to put oneself into each different learning style in order to elaborate the presentation of learning material in a way that will interest every learning style. This should be no different when we think about computer-assisted language learning. For instance, a traditional reference grammar will mostly attract learners of the innovator and observer types and discourage the experimenter or conceptualizer. To make such a type of grammar more attractive to the other learners, the course designer must seek to present the subject matter in a different way, e.g. visually, or allow a student to learn through discovery exercises instead of a mere organized list.

Another relevant factor is planning and self-control. According to O'Malley and Chamot (1990), these are basic meta-cognitive strategies. Essentially, a learner should have the possibility to review his or her learning path and the material he or she has covered at any given point in the course. The learner should also be able to take notes while using a program. According to Beaudoin (2003) this can be readily accomplished in a CALL if a program develops a personal profile of each learner as he or she evolves in the course. For instance, such profile could help a learner focus on his strength and weaknesses, priorities, deadlines, etc.

**3.0 Conclusion**

This prospective review has focused on the following goals: First, to identify the fundamental precepts of the most prominent language teaching methodologies that have been developed in the 20th Century. Second, to assess to what extent computer-assisted language learning can meet and satisfy those fundamental precepts. Based on the research evidence presented, the development on CALL should aim at evolving from those precepts, which are based on fundamental assumptions about language acquisition. What we have seen is that CALL has the potential of meeting most of the main methodological precepts in language learning, though one inherent limitation, at least currently, seems to be in providing a real-time, oral language learning environment to students. This only seems to be a technological limitation at the moment, as wireless technologies certainly offer the potential of providing a live, interactive language environment. As we pointed out, there is at least one experiment going on which seeks at exploring the potential of Virtual language immersion.

Another main conclusion to draw from our review, which was also pointed out in Adriaen (2002:148, citing Jonassen et al 1999) is that "If we are to take advantage of technology's full potential in improve language teaching and learning, we will have to operate a change in perspective. Just as languages methodologies evolved from an instructional model where knowledge is transferred from an expert (the teacher) to a novice (the learner), we need to view technology not so much as a repository for, and a transmitter of, information but as a tool to access and manipulate information, and to communicate with others.". We also need to go back to fundamental precepts of language methodologies and systematically try and implement them in a computer-assisted environment. Will CALL ever replace traditional language teaching? Probably not, but it certainly can serve as an innovative tool in improving language teaching and language learning. This prospective review identified ways I which it could possibly do so.

**References**

- Adriaen, M. (2002) 'Instruction Design Principles for Language Teaching', *Distances* vol 5 :143-153. Quebec : CQFD.
- Allwright, R.L. (1977) 'Language Learning through Communication Practice'. *ELT documents* 76(3). London : British Council.
- Asher, J.(1969) The Total Physical Response Approach to Second Language Learning. *Modern Language Journal*. 53 :3-17.
- Austin, J.L. (1962) *How To Do Things with Words*. Oxford : Clarendon Press. Beaudoin, M. (2003). 'Principes d'enseignement de la grammaire à l'Internet'. *Conférence WorldCALL 2003*, 7-10 mai 2003, Banff : Canada.
- Bereiter, C. (2002). *Education and mind in the knowledge age*. Mahwah : L. Erlbaum Associates.
- Bloomfield, L. (1935) *Language*. New-York: Holt.
- Bouffard, P. (2003) 'Considérations ergonomiques dans la conception d'activités orales sur Can8.' Paper presented at *Multimedia, Internet and French Studies II*. Simon Fraser University.
- Bougaief, A. (2002) 'Redécouvrir le plaisir de lire avec Annotations' in *Distances* vol5:31-41. Quebec: CQFD
- Brook, N. (1964) *Language and Language Learning : Theory and Practice*. 2nd edition. New York : Hartcut Brace.
- Breen M and C.N. Candlin (1980) 'The essential of a Communicative Curriculum in Language Teaching' . *Applied Linguistics* 1(2) : 89-112.
- Brumfit C.J. and K. Johnson (eds) (1979) *The communicative Approach to Language Teaching*. Oxford : Oxford University Press.
- Caré, J.-M. (1999). Apprendre les langues étrangères. *Le français dans le monde*, Numéro spécial, janvier 1999.
- Carey, S. (1999) 'The Use of WebCT for a Highly Interactive Graduate Seminar'. *CALL*, 12(10) :85-98.
- Carey, S. (2000) 'Using Technology to Foster Authentic Communication for Second Language Students' in *Proceedings from TEND 2000*. Dubai, United Arab Emirates.
- Carey, S. (2002) 'How to use WebCT to Improve the Minority Francophone and French Immersion Experience in Western Canada' in *Distances*, Vol 5:129-139. Quebec : CQFD.
- Cartier, M. (1989). *Nouvelles images, nouveaux usages*. Montréal : Université du Québec.
- Chanier, T. (2000). *Hypermédia, interaction et apprentissage dans des systèmes d'information et de communication : Résultats et agenda de recherche*. Duquette, L. & Laurier, M. (éd.), *Apprendre une langue dans un environnement multimédia*, Montréal : Les Éditions logiques, 53-87.
- Chomsky, N. (1965) *Aspects of the Theory of Syntax*. Cambridge, Mass: MIT Press.
- Curran C. (1976) *Counselling-Learning in Second Language*. Apple River Ill.: Apple River Press.
- Delcloque, P. (2000). *The history of CALL*. Site Web : <http://www.history-of-call.org>. English Language Services (1964) *English 900*. New York: Collier, McMillan.
- Firth, J.R. (1957) *Papers in Linguistics: 1934-1951*. London: Oxford University Press.
- Frisby A.W. (1957) *Teaching English as a Foreign Language: Notes and Comments*. Overseas, London: Longman
- Gattegno C. (1972) *Teaching Foreign Language in Schools: The Silent Way*. 2nd edition. New York: Educational Solutions.
- Grant, N. (2002) 'Immersion électronique: Intensifier l'acquisition de l'écrit dans un programme de langue seconde en Colombie-Britannique' in *Teaching Interaction*. Elizabeth Pena (ed.) Caracas: VenTESOL 12-14.
- Gurbuz, T., Yildirim, S., & Ozden, M. (2000). A Comparison of Student-Teachers' Attitudes toward Computers in On-Line and Traditional Computer Literacy Courses: A Case Study. *Society for Information Technology and Teacher Education International Conference: Proceedings of Site 2000* .
- Hornby, A.S. (1953) 'The Situationla Approach in Language Teaching' A series of three articles in *English, Language Teaching*. 4:98-1-4, 121-8, 150-6.
- Hymes, D. (1972) 'On Communicative Competence' In J.B. Pride and J. Holmes (eds), *Sociolinguistics*, pp.269-93. Harmondsworth : Penguin.
- Jonassen, D., H. Peck, K. Wilson & Brent G. (1999) *Learning with Technology : A Constructivist Perspective*. Upper Saddle River, New-Jersey. Merrill, Prentice-Hall.
- Karsenti, Thierry (2002) 'Technopédagogie et enseignement du français : Expérience prometteuse pour la formation des enseignants.' in *Distances* vol 5 :41-57. Quebec : CQFD.
- Kenyon, D., & Malabonga, V. (2001). Comparing Examinee Attitudes toward Computer-Assisted and Other Oral Proficiency Assessments. *Language Learning and Technology*, 5(2), 60-83.
- Kirsh, D. (2000). A few thoughts on cognitive overload. *Intellectica*, 30, 19-53.
- Kolb, D.A. (1976). *Learning style inventory : technical manual*. Boston : McBer and Company.
- Koohang, A. (1989). A Study of Attitudes Toward Computers: Anxiety, Confidence, Liking, and Perception of Usefulness. *Journal of Research on Computing in Education*, 137-150.
- Krashen S. (1981) *Second Language Acquisition and Second Language Learning*. Oxford : Pergamon.
- Krendl, K., & Broihier, M. (1992). Student Responses to Computers: A Longitudinal Study. *Educational Computing Research*, 8(2), 215-227.
- Laboz, F. (2001). Conception multimédia : la métaphore, guide de l'intentionnalité. Colloque *La communication médiatisée par ordinateur : un carrefour de problématiques*, 15-16 mai 2001, Sherbrooke, Canada.
- Lado, R. (1977) *English Teaching Series*. 7 books. New-York: Regents
- .Littelwood, W. (1981) *Communicative Language Teaching*. Cambridge : Cambridge University Press.

- Lonfils, C. & Vanparys, J. (2001). How to design user-friendly CALL interfaces. *CALL*, 14 (5), 405-417.
- Lozanoz, G. (1978) *Suggestology and Outlines of Suggestopedia* New York : Gordon and Breach.
- Mitra, A., & Steffensmeier, T. (2000). Changes in Student Attitudes and Student Computer Use in an Computer-Enriched Environment. *Journal of Research on Computing in Education*, 32(3), 417-438.
- Nanard, M. (1995). Les hypertextes au-delà des liens, la connaissance. *Sciences et techniques éducatives*, 2 (1), 31-59.
- Notaise, J., Barda, J. & Dusanter, O. (1995). *Dictionnaire du multimédia*. AFNOR.
- O'Maley, J.M. & Chamot, A.U. (1990). Learning strategies in second language acquisition. New York : Cambridge University Press.
- Palmer, H.E. (1923) *The Oral Method of Teaching Languages*. Cambridge, Mass: Heiffer.
- Piaget, J. (1956) *The Child's Conception of Space*. London: Routledge.
- Paquelin, D. (2002). Analyse d'applications multimédias pour un usage pédagogique. À la recherche de l'intentionnalité partagée. *ALSIC*, 5 (1), 3-32.
- Peters, M. (2002). Compétences, TIC et enseignement d'une langue. *Cyber-langues 2002* <http://cyberlangues.online.fr/>: Association Cyber-langues.
- Richards, J.C and T.S., Rodgers (1997) *Approaches and Methods in Language Teaching*. Cambridge University Press.
- Richard, Jean-Yve (2002) 'Nouvelles technologies, nouvelles perspectives grammaticales' in *Distances* vol 5 :103-113. Quebec : CQFD.
- Rogers, C.R. (1951) *Client-Centered Therapy*. Boston : Houghton Mifflin.
- Searle, J.R. (1969) *Speech Acts : An Essay in the Philosophy of Language*. Cambridge : Cambridge University Press.
- Smith, B., Caputi, P., & Rawstorne, P. (2000). Differentiating computer experience and attitudes toward computers: an empirical investigation. *Computers in Human Behavior*, 16, 59-81.
- Terrel, T.D. (1977) 'A Natural Approach to Language Acquisition and Learning.' *Modern Language Journal* 61 : 325-36. *Vis-à-vis* (2004) CD-Rom Workbook Manual for Beginning French. By A. Muysken and O. Hadley. 3rd edition, McGraw-Hill Higher Education.
- Vygotsky, L. (1978) *Mind and Society : The Development of Higher Psychological Processes*. Cambridge, Mass. : Harvard University Press.
- Warschauer, M., & Healey, D. (1998). Computers and language learning: an overview. *Language Teaching*, vol. 31, pp. 57-71.

## COMMENTAIRES

Nous vous invitons à **réagir** à cet article. Votre commentaire sera publié afin de poursuivre la réflexion et susciter l'échange.