

Abstract

Language is the natural means of human communication; the most effective way we have to express ourselves to each other. We use language in a host of different ways: to explain complex ideas and concepts; to manage human resources; to negotiate; to persuade; to make our needs known; to express our feelings; to narrate stories; to record our culture for future generations; and to create beauty in poetry and prose. For most of us language is fundamental to all aspects of our lives.

Key Words: Computer-Assisted Language Learning; Modern Technologies.

Language technologies are information technologies that are specialized for dealing with the most complex information medium in our world: human language. Therefore these technologies are also often subsumed under the term Human Language Technology. Human language occurs in spoken and written form. Whereas speech is the oldest and most natural mode of language communication, complex information and most of human knowledge is maintained and transmitted in written texts. Speech and text technologies process or produce language in these two modes of realization. But language also has aspects that are shared between speech and text such as dictionaries, most of grammar and the meaning of sentences. Thus large parts of language technology cannot be subsumed under speech and text technologies. Among those are technologies that link language to knowledge. We do not know how language, knowledge and thought are represented in the human brain. Nevertheless, language technology had to create formal representation systems that link language to concepts and tasks in the real world. This provides the interface to the fast growing area of knowledge technologies.

In our communication we mix language with other modes of interaction and other information media. We combine speech with gesture and facial expressions. Digital texts are combined with pictures and sounds. Movies may contain language in spoken and written form. Thus speech and text technologies overlap and interact with many other technologies that facilitate processing of multimodal communication and multimedia documents.

Computational linguistics (CL) is a discipline between linguistics and computer science which is concerned with the computational aspects of the human language faculty. It belongs to the cognitive sciences and overlaps with the field of artificial intelligence (AI), a branch of computer science aiming at computational models of human cognition. Computational linguistics has applied and theoretical components

Applied CL focuses on the practical outcome of modeling human language use. The methods, techniques, tools and applications in this area are often subsumed under the term language engineering or (human) language technology. Although existing CL systems are far from achieving human ability, they have numerous possible applications.

The goal is to create software products that have some knowledge of human language. Such products are going to change our lives. They are urgently needed for improving human-machine interaction since the main obstacle in the interaction between human and computer is a communication problem. Today's computers do not understand our language but computer languages are difficult to learn and do not correspond to the structure of human thought. Even if the language the machine understands and its

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domain of discourse are very restricted, the use of human language can increase the acceptance of software and the productivity of its users.

Much older than communication problems between human beings and machines are those between people with different mother tongues. One of the original aims of applied computational linguistics has always been fully automatic translation between human languages. From bitter experience scientists have realized that they are still far away from achieving the ambitious goal of translating unrestricted texts. Nevertheless computational linguists have created software systems that simplify the work of human translators and clearly improve their productivity. Less than perfect automatic translations can also be of great help to information seekers who have to search through large amounts of texts in foreign languages

Language Engineering is the application of knowledge of language to the development of computer systems which can recognize, understand, interpret, and generate human language in all its forms. In practice, Language Engineering comprises a set of techniques and language resources. The former are implemented in computer software and the latter are a repository of knowledge which can be accessed by computer software.

The term Information Society has been around for a long time now and, indeed, has become something of a cliché. At a broader level Barry Jones, the author of the House of Representatives Standing Committee's 1991 report 'Australia as a Information Society' sets out a definition of the Information Society which sees it as simply "a period when use of time, family life, employment, education and social interaction are increasingly influenced by access to Information Technology" (Australia as an Information Society: Grasping New Paradigms, 1991). Drawing a direct line between the presences of information technology with some sort of new society is hard to justify. Will the presence of say, a computer in every home, make us an Information Society? Or should that be two computers? At what point will we know we've arrived? What changes in our fundamental institutions, ways of living and working characterizes an Information Society, as opposed to a non- Information Society? A further weakness of this concept is highlighted by the many commentators who point out the dangers of technological determinism in thinking about the Information Society and reject the view that technology impacts on society and is the prime agent of change, defining the social world (Webster, 1995:10)

Computers have been used for language teaching ever since the 1960's. According to Warschauer & Healey (1998), this 40-year period can be divided into three main stages: behaviorist CALL, communicative CALL, and integrative CALL. Each stage corresponds to a certain level of technology and certain pedagogical theories.

Behaviorist CALL

In the 1960's and 1970's the first form of computer-assisted Language Learning featured repetitive language drills, the so-called drill-and-practice method. It was based on the behaviorist learning model and as such the computer was viewed as little more than a mechanical tutor that never grew tired. Behaviorist CALL was first designed and implemented in the era of the mainframe and the best-known tutorial system, PLATO, ran on its own special hardware. It was mainly used for extensive drills, explicit grammar instruction, and translation tests (Ahmad, et al., 1985).

Communicative CALL

Communicative CALL emerged in the 1970's and 1980's as a reaction to the behaviorist approach to language learning. Proponents of communicative CALL rejected behaviorist approaches at both the theoretical and pedagogical level. They stressed that CALL should focus more on using forms rather than on the forms themselves. Grammar should be taught implicitly and students should be encouraged

to generate original utterances instead of manipulating prefabricated forms (Jones & Fortescue, 1987; Philips, 1987). This form of computer-based instruction corresponded to cognitive theories which recognized that learning was a creative process of discovery, expression, and development. The mainframe was replaced by personal computers that allowed greater possibilities for individual work. Popular CALL software in this era included text reconstruction programs and simulations.

Integrative CALL

The last stage of computer-assisted Language Learning is integrative CALL. Communicative CALL was criticized for using the computer in an ad hoc and disconnected fashion and using the computer made “a greater contribution to marginal rather than central elements” of language learning (Kenning & Kenning, 1990: 90). Teachers have moved away from a cognitive view of communicative language teaching to a socio-cognitive view that emphasizes real language use in a meaningful, authentic context. Integrative CALL seeks both to integrate the various skills of language learning (listening, speaking, writing, and reading) and to integrate technology more fully into language teaching (Warschauer & Healey, 1998). To this end the multimedia-networked computer provides a range of informational, communicative, and publishing tools that are potentially available to every student.

Why Use CALL?

Research and practice suggest that, appropriately implemented, network-based technology can contribute significantly to:

Experiential Learning

The World Wide Web makes it possible for students to tackle a huge amount of human experience. In such a way, they can learn by doing things themselves. They become the creators not just the receivers of knowledge. As the way information is presented is not linear, users develop thinking skills and choose what to explore.

Motivation

Computers are most popular among students either because they are associated with fun and games or because they are considered to be fashionable. Student motivation is therefore increased, especially whenever a variety of activities are offered, which make them feel more independent.

Enhanced Student Achievement

Network-based instruction can help pupils strengthen their linguistic skills by positively affecting their learning attitude and by helping them build self-instruction strategies and promote their self-confidence.

Authentic Materials for Study

All students can use various resources of authentic reading materials either at school or from their home. Those materials can be accessed 24 hours a day at a relatively low cost.

Greater Interaction

Random access to Web pages breaks the linear flow of instruction. By sending E-mail and joining newsgroups, EFL students can communicate with people they have never met. They can also interact with their own classmates. Furthermore, some Internet activities give students positive and negative feedback by automatically correcting their on-line exercises.

Individualization

Shy or inhibited students can be greatly benefited by individualized, student-centered collaborative learning. High fliers can also realize their full potential without preventing their peers from working at their own pace.

Independence from a Single Source of Information

Although students can still use their books, they are given the chance to escape from canned knowledge and discover thousands of information sources. As a result, their education fulfills the need for interdisciplinary learning in a multicultural world.

Global Understanding

A foreign language is studied in a cultural context. In a world where the use of the Internet becomes more and more widespread, an English Language teacher's duty is to facilitate students' access to the web and make them feel citizens of a global classroom, practicing communication on a global level.

What Can We Do With CALL?

There is a wide range of on-line applications which are already available for use in the foreign language class. These include dictionaries and encyclopaedias, links for teachers, chat-rooms, pronunciation tutors, grammar and vocabulary quizzes, games and puzzles, literary extracts, Internet-based programs, websites, or activities with students like Email projects -Lesson plan archives for teachers -Vocabulary worksheets using an online thesaurus -Skimming/scanning activities using a local movie theater webpage -Research/writing exercises for investigating Internet hoaxes. (For example: The Applications Fair is an event for teachers to share how they use different types of software - in innovative, clever, or just plain efficient ways - in English instruction or assessment during in-class or out-of-class activities. In the past, teachers/presenters have shown how they have used prepackaged language learning software such as Focus on Grammar, Word Attack, Testmaster, Grolier Encyclopedia, or Phraze Craze for improving skills in vocabulary, reading, writing, and speaking & understanding. Teachers have also demonstrated effective and adaptive uses of applications not specifically designed for ESL or other language use such as Microsoft Word, PowerPoint, and Yahoo! Groups. Examples: -Using Microsoft Word's comment feature for writing feedback -Using Excel to teach budgeting finances as a life skill -Using PowerPoint for students' classroom presentations -Using Yahoo! Groups for developing class communication -Using HyperStudio to illustrate students' descriptive writing -Using Grolier Encyclopedia with vocabulary worksheets. The EV Mini-workshops are intended to be limited seating events for hands-on workshops where participants will gain experience in adaptation of standard software for CALL purposes. Participants will have the opportunity to create a product or gain depth in use of software. Examples: -Using iMovie -Working with audio and/or video -Working with Discussion Boards -Using BBEdit(Mac) to create and upload HTML files -Setting up a mailing list with Yahoo! Groups -Learning how to MOO -Using Hot Potatoes to create online quizzes -Using Excel for grade calculations. The Developers' Showcase is one of several ways in which the CALL-IS disseminates information about computers and computer-assisted instruction to the ESL/EFL professional community. The Showcase provides an opportunity for the designers of ESL/EFL software to display their work, and for potential users, software developers, and marketers to examine and react to it. This Showcase includes materials in the following two categories: 1. disk-based software, including floppy-disk, hard disk, and CD-ROMs. 2. web-based software, including both programs that can be accessed directly from the web and those that can be downloaded). Fortunately, technology offers some easy ways to help students build vocabulary, achieve reading fluency, improve comprehension, access curriculum content, and strengthen their home-school connections.

1. Image Galleries

To assist students who are learning English, preview each of your lessons and support the text you are reading with suitable images from the Internet. Images will provide contextual clues and help ELL students determine meaning. Google's image searches (<http://images.google.com>), for example, allow you to search via key words for photographs and illustrations, which can be easily downloaded and printed. For students needing additional vocabulary support, picture dictionaries are available at <http://enchantedlearning.com>.

2. Multilingual Books

Research shows that if students have literacy in their primary language, they are able to transfer those skills to reading in English (Snow, Burns, Griffin, 1998). But locating multilingual books can be a challenge--and buying them can be very expensive. Instead, invite students to publish their own multilingual books using Microsoft Word, as in the Torontobased Thornwood Public Schools' Dual Language Showcase (<http://thornwood.peelschools.org/Dual/>). Students in this district--which is home to 40 languages--create their own books and post them online. These ELL students also receive kits with corresponding multilingual books and audio tapes to share with their families. Another option for building fluency: one of the many integrated audio and software programs available, such as Wiggleworks (www.scholastic.com/wiggleworks).

3. Multimedia Projects

In the upper-elementary and middle-school grades, students study content areas in greater depth and are exposed to more complex vocabulary and complicated concepts. With just a textbook, ELL students may experience enormous difficulty. Multimedia projects offer students hands-on, engaging ways to explore the scientific content and concepts presented. For example, the Jason Project (www.jasonproject.org) guides students through an experience-based science curriculum with video, live satellite broadcasts, and a variety of online activities, including digital labs and electronic journals. World Wide Web (WWW) is a virtual library of information that can be accessed by any user around the clock. If someone wants to read or listen to the news, for example, there are a number of sources offering the latest news either printed or recorded. The most important newspapers and magazines in the world are available on-line and the same is the case with radio and TV channels.

Another example is communicating with electronic pen friends, something that most students would enjoy. Teachers should explain how it all works and help students find their keypals. Two EFL classes from different countries can arrange to send E-mail regularly to one another. This can be done quite easily thanks to the web sites providing lists of students looking for communication. It is also possible for two or more students to join a chat-room and talk on-line through E-mail. .

Another network-based EFL activity could be project writing. By working on a project a pupil can construct knowledge rather than only receive it. Students can work on their own, in groups of two or in larger teams, in order to write an assignment, the size of which may vary according to the objectives set by the instructor. A variety of sources can be used besides the Internet such as school libraries, encyclopedias, reference books etc. The Internet itself can provide a lot of food for thought. The final outcome of their research can be typed using a word processor. A word processor can be used in writing compositions, in preparing a class newsletter or in producing a school home page. In such a Web page students can publish their project work so that it can reach a wider audience. That makes them feel more responsible for the final product and consequently makes them work more laboriously.

The Internet and the rise of computer-mediated communication in particular have reshaped the uses of computers for language learning. The recent shift to global information-based economies means that students will need to learn how to deal with large amounts of information and have to be able to communicate across languages and cultures. At the same time, the role of the teacher has changed as well. Teachers are not the only source of information any more, but act as facilitators so that students

can actively interpret and organize the information they are given, fitting it into prior knowledge. Students have become active participants in learning and are encouraged to be explorers and creators of language rather than passive recipients of it (Brown, 1991). Integrative CALL stresses these issues and additionally lets learners of a language communicate inexpensively with other learners or native speakers. As such, it combines information processing, communication, use of authentic language, and learner autonomy, all of which are of major importance in current language learning theories.

Teachers' Barriers to the Use of Computer-assisted Language Learning

The barriers inhibiting the practice of Computer-assisted Language Learning can be classified in the following common categories (a) financial barriers, (b) availability of computer hardware and software, (c) technical and theoretical knowledge, and (d) acceptance of the technology.

Financial Barriers

Financial barriers are mentioned most frequently in the literature by language education practitioners. They include the cost of hardware, software, maintenance (particular of the most advanced equipment), and extend to some staff development. Froke (1994b) said, "concerning the money, the challenge was unique because of the nature of the technology." Existing universities policies and procedures for budgeting and accounting were well advanced for classroom instruction. The costs of media were accounted for in the university as a part of the cost of instruction. Though the initial investment in hardware is high, inhibiting institutions' introduction of advance technologies; but Hooper (1995) recommends that the cost of computers will be so low that they will be available in most schools and homes in the future.

Lewis et al. (1994) indicate three conditions under which Computer-assisted Learning and other technologies can be cost-effective: Computer-assisted Learning costs the same as conventional instruction but ends up with producing higher achievement in the same amount of instructional time, it results in students achieving the same level but in less time. These authors indicate that in examples where costs of using technologies in education are calculated, they are usually understand because the value of factors, such as faculty time and cost of equipment utilization, is ignored (McClelland, 1996).

Herschbach (1994) argues firmly that new technologies are add-on expenses and will not, in many cases, lower the cost of providing educational services. He stated that that the new technologies probably will not replace the teachers, but will supplement their efforts, as has been the pattern with other technologies. The technologies will not decrease educational costs or increase teacher productivity as currently used. Low usage causes the cost barrier. Computers, interactive instruction TV, and other devices are used very few hours of the day, week, or month. Either the number of learners or the amount of time learners apply the technology must be increased substantially to approach the concept of cost-effectiveness. There are other more quick and less expensive ways of reducing costs, no matter how inexpensive the technology being used (Kincaid, McEachron, & McKinney, 1994.)

Availability of Computer Hardware and Software

The most significant aspects of computer are hardware and software. Availability of high quality software is the most pressing challenge in applying the new technologies in education (Herschbach, 1994; Miller, 1997; Office of Technology Assessment, 1995; Noreburg & Lundblad, 1997). Underlying this problem is a lack of knowledge of what elements in software will promote different kinds of learning. There are few educators skilled in designing it because software development is costly and time-consuming (McClelland, 1996).

McClelland (1996) indicated having sufficient hardware in locations where learners have access to it problematic and is, of course, partly a financial problem. Computer hardware and software

compatibility goes on to be a significant problem. Choosing hardware is difficult because of the many choices of systems to be used in delivering education, the delivery of equipment, and the rapid changes in technology.

Technical and Theoretical Knowledge

A lack of technical and theoretical knowledge is another barrier to the use of Computer-assisted Language Learning technology. Not only is there a shortage of knowledge about developing software to promote learning, as shown above, but many instructors do not understand how to use the new technologies. Furthermore, little is known about integrating these new means of learning into an overall plan. In the communication between McClelland and C. Dede (1995), Dede indicated the more powerful technologies, such as artificial intelligence in computers, might promote learning of higher-order cognitive skills that are difficult to access with today's evaluation procedures and, therefore, the resulting pedagogical gains may be under-valued. Improper use of technologies can affect both the teacher and learner negatively (Office of Technical Assessment, 1995).

Acceptance of Technologies

We live in a time change. Gelatt (1995) stated that change itself has changed. Change has become so rapid, so turbulent, and so unpredictable that is now called "white water" change (p.10). Murphy & Terry (1998a) indicated the current of change move so quickly that they destroy what was considered the norm in the past, and by doing so, create new opportunities. But, there is a natural tendency for organizations to resist change. Wrong conceptions about the use of technology limit innovation and threaten teachers' job and security. Instructors are tend not to use technologies that require substantially more preparation time, and it is tough to provide instructors and learners access to technologies that are easy to use (Herschbach, 1994).

Finally, engaging in Computer-assisted Language Learning is a continuing challenge that requires time and commitment. As we approach the 21st century, we realize that technology as such is not the answer to all our problems. What really matters is how we use technology. Computers can/will never substitute teachers but they offer new opportunities for better language practice. They may actually make the process of language learning significantly richer and play a key role in the reform of a country's educational system. The next generation of students will feel a lot more confident with information technology than we do. As a result, they will also be able to use the Internet to communicate more effectively, practice language skills more thoroughly and solve language learning problems more easily.

References:

1. Froke, M. (1994). A vision and promise: Distance education at Penn State, Part1-Toward an experience-based definition. *The Journal of Continuing Higher Education*, 42 (2), 16-22.
2. Gelatt, H. B. (1995). Future sense: Creating the future. *The Futurist*, 3 (2), 35-43.
3. Herschbach, D. (1994). Addressing vocational training and retaining through educational technology: Policy alternatives. (Information Series No. 276). Columbus, OH: The National Center for Research in Vocational Education.
4. Kincaid, H., McEachron, N. B., & McKinney, D. (1994). Technology in public elementary and secondary education: a policy analysis perspective. Menlo Park, CA: Stanford Research Institute.
5. Miller, J. V. (1997). Questions about communications technologies for educators: An introduction. In N. M. Singer (Ed.), *Communications technologies: their effect on adult, career, and vocational education* (Information Series No. 244,1-4). Columbus, OH: The National Center for Research in Vocational Education.
6. Murphy, T. H., & Terry, R., Jr. (1998a). Adoption of CALL technologies in education: A national delphi. *Proceedings of the Forty-Fourth Annual Southern Agricultural Education Research Meeting*, 112-123.
7. Pickering, John, Teaching on the Internet is learning, *Active Learning*, <http://www.cti.ac.uk/publ/actlea/issue2/pickering/>